

UNMC 7th Annual Graduate Medical Education Research Symposium



April 29, 2025 | 3:00 - 6:00 p.m.

Truhlsen Events Center
Michael F. Sorrell Center for Health Science Education



Welcome to the UNMC 7th Annual Graduate Medical Education Research Symposium

The purpose of this symposium is to foster and showcase the research conducted by UNMC and CHI residents and fellows.

Thank you for attending and supporting our Graduate Medical Education (GME) community!

Chandra Are, MD, MBA
Premila Leiphrakpam, MD, PhD
Erin Snow, MPA, MPH, C-TAGME
Rachel Nelsen, C-TAGME
Amy Guziec, MA, C-TAGME
Arianne Marcoux. C-TAGME

GME Office Research Collaboratives that support House Officers' Research

Patient Safety, Quality Improvement, and Disparities Research Collaborative

Chandra Are, MD, MBA Premila Leiphrakpam, MD, PhD Lynette Smith, PhD Kaeli Samson, MA, MPH Ronit Gandhi, BS

This Research Collaborative promotes research in various aspects related to patient safety, quality improvement, and addressing disparities in health care. The Collaborative consists of the Senior Associate Dean, an MD, Ph.D. in research and education, a Ph.D. in statistics, and two Master's level statisticians. All of them possess significant experience in clinical research and help house officers with study design, methodology, statistical support, data acquisition, IRB approval, abstract, and manuscript preparation. The Collaborative meets every Tuesday to help house officers with research.

Educational Research Collaborative

Chandra Are, MD, MBA Premila Leiphrakpam, MD, PhD

This Research Collaborative promotes research in various aspects related to medical education. The Collaborative consists of the Senior Associate Dean, and an MD, Ph.D. in research and education. Both of them possess significant experience in educational research and can help with study design, methodology, statistical support, data acquisition, IRB approval, and abstract and manuscript preparation. The Collaborative meets every Wednesday to help house officers with research.

A special thank you to:

MODERATORS

Dr. Dele Davies
Dr. Michael Ash
Dr. Kevin Garvin
Dr. Joseph Khoury
Dr. Ronald Krueger
D. David Mercer
Dr. Mark Rupp

Dr. Melissa Acquazzino Dr. Jennifer Adams Dr. Jenna Allison Dr. Christie Barnes

Dr. Elizabeth Bradford Bell

Dr. Ishfaq Bhat

Dr. Chad Branecki

Dr. Jesse Cox

Dr. John Harrington

Dr. Kathryn Hutchins

Dr. Subodh Lele

Dr. Shannon Lynch

Dr. Courtney McLean

Dr. Adam Sutton

Dr. Tiffany Tanner

Dr. Jonathan Thompson

Dr Michael Weaver

Dr. Tammy Wichman

Dr. Ronald Zolty

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Program Agenda

Introduction

Chandra Are, MD

Senior Associate Dean, Graduate Medical Education

University of Nebraska Medical Center

Truhlsen Events Center 1001

Welcome Remarks

3:00 - 3:05 p.m.H. Dele Davies, MD

Interim Chancellor

University of Nebraska Medical Center

Truhlsen Events Center 1001

3:05 - 3:10 p.m.Bradley Britigan, MD (virtual)

Dean, College of Medicine

University of Nebraska Medical Center

Truhlsen Events Center 1001

3:10 - 3:15 p.m.Chandra Are, MD

Senior Associate Dean, Graduate Medical Education

University of Nebraska Medical Center

Truhlsen Events Center 1001

3:15 - 3:30 p.m.**Orientation With Moderators/Coordinators**

Michael F. Sorrell Center (MSC) 1005

3:30 p.m. onwards **Heavy Appetizers & Drinks**

Truhlsen Events Center Foyer

3:30 – 5:00 p.m. Oral Presentations, Concurrent Sessions

MSC 1005, MSC 1010, MSC 2014, MSC 2018, MSC 3030,

MSC 4053, Linder Reading Room (MSC 2001)

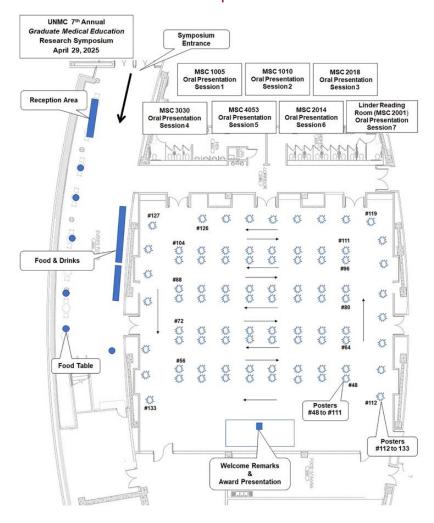
Poster Presentations, Concurrent Sessions

Truhlsen Events Center 1001

5:30 p.m. **Award Presentations & Closing Remarks**

Truhlsen Events Center 1001

Truhlsen Events Center Map



Oral Presentations: Original Research, Review, & **Case Reports**

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		SC 1010 Original Research & Case Reports Michael Ash	
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Moderator	: Dr. Joseph K	houry	

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Moderator: Dr. David Mercer

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38	4:10	Dr. Yuqian Tian	60-61
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Moderator: Dr. Mark Rupp

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Graduate Medical Education Research Symposium

Oral Presentations: Original Research, Review & Case Reports

#1 Trends and Positive Predictive Value of High-Sensitivity Troponin for Diagnosing Myocarditis in the Emergency Department

Jaikaran Man Singh¹, Anji Yetman^{1,2}, David Danford¹, Christian Oarhe³, Melissa Wehrmann¹

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³Department of Pediatrics, Division of Pediatric Emergency Medicine, College of Medicine, University of Nebraska Medical Center, Omaha, NE, USA

Mentor: Melissa Wehrmann

Program: Pediatrics - Cardiology

Type: Original Research

Background: Myocarditis is inflammation of the myocardium, most often secondary to a viral illness. The gold standards for diagnoses are biopsy and magnetic resonance imaging, with echocardiography and Troponin levels being supportive. The use of Troponin levels as a marker of myocardial inflammation has persisted since the COVID-19 pandemic. Isolated Troponin levels have poor specificity and sensitivity, and false positive results can lead to additional costs and misdiagnoses.

Methods: Approval was obtained from the institutional review board before data collection. The electronic medical record was queried for all patients who had a Troponin level drawn in the emergency department of a freestanding children's hospital since January 2016, with pre-determined exclusion criteria. A retrospective chart review was performed, collecting information on symptoms, vital signs, physical exam, lab results (including Troponin), and echocardiogram. Patients were classified as having myocarditis using criteria by the American College of Cardiology. The positive predictive value (PPV) of Troponin was calculated, and patients with myocarditis were compared with patients without myocarditis. The data was analyzed using Chi-Square and Fisher's Exact Test.

Results: A total of 1409 Troponin levels were drawn, and 557 patients were included in the final study. There was a steady increase in labs drawn every year. Eighty four patients had a positive troponin level, and 13 had myocarditis, leading to a PPV of 15.48%. Patients with myocarditis had a greater degree of Troponin elevation and were more likely to have elevated pro-Brain Natriuretic Peptide and depressed function.

Conclusion: In the absence of other clinical features, troponin levels have a poor PPV. Further studies are needed to delineate which patients would benefit most from testing.

#2 Survey of Current Clinical and Imaging Practices Amongst Regional Obstetric Providers in Nebraska: A Discussion of Future Application of Artificial Intelligence in Fetal Echocardiography

Farhath Sulthana¹, Alex Foy², Ling Li³, Jason Christensen²

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²Department of Cardiology, Children's Nebraska, Omaha, NE, USA

³Department of Internal Medicine, Division of Cardiovascular Medicine, College of Medicine, University of Nebraska Medical Center, Omaha, NE, USA

Program: Pediatrics Mentor: Alex Foy

Type: Original Research

Background: Congenital heart disease (CHD) is the leading cause of birth defects, with a prevalence of 6 to 12 per 1,000 live births. Early detection through fetal echocardiography improves outcomes, but limitations in image quality, equipment, examiner expertise, and operator skill often lead to missed diagnoses. Artificial intelligence (AI), particularly deep learning, shows promise in enhancing diagnostic accuracy. However, we must explore the significant challenges that remain in integrating AI as standard care.

Methods: This study utilized a standard questionnaire to survey the current clinical and imaging practices amongst regional obstetric providers in Nebraska in obtaining guideline-recommended views for fetal cardiac anatomy at the 18-22 week ultrasound

Results: A total of 51 clinics in Nebraska were identified for inclusion in this study, and 26 did not respond. Results from the remaining 25 clinics were used for the following conclusions (Table 1).

Conclusion: It was found that sonographers have a strong confidence level in obtaining these images. Over 70% of providers confirmed that axial sweeps were performed during fetal surveys. This is reassuring, as the detection of CHD by medical providers and AI is highly dependent on the axial sweep of the fetal heart. Despite this standardization and confidence level, prenatal detection rates of CHD in Nebraska are reportedly only 20-30%. It is evident that practices varied significantly in type of equipment and PACs with one clinic even reporting the use of a paper archiving system. This speaks to the disparities in prenatal diagnosis of CHD and the lack of access to similar resources based on geographic location and population density.

Table 1. Results from Obstetric Ultrasound Sonographer/Provider Questionnaire.

	Object this Illians are also consume the Monaridae Occasion and the					
Obstetric Ultrasound Sonographer/Provider Questionnaire						
Clinic	Participant's Role in the Clinic	Confidence Level in Obtaining Guideline -Recommended Views for Fetal Cardiac Anatomy Screening at the 18-22-week Ultrasound	Is Cine Imaging for Fetal Anatomy Scans Stored?	Is Axial Sweep (of the Thorax) Performed on Fetal Surveys?	Brand of Ultrasound Machine Used	Picture Archiving and Communication System (PACS) Used
Α	Sonographer	10	Yes	Yes	GE Voluson E6	Paper
В	Director of Radiology	n/a	Unsure	Unsure	Philips Epic	Merge
С	Radiology Manager	n/a	Yes	Yes	Philips Affinity 70	McKesson
D	Sonographer	7	Yes	Yes	Canon Aplio	McKesson
Е	Sonographer	8	Yes	Yes	GE Voluson E10	McKesson
F	Ultrasound Supervisor	n/a	Yes	Yes	GE Voluson E8	Philips Intellispace
G	Ultrasound	10	Yes	Yes	GE Voluson	Philips
Н	Tech Sonographer	8	Yes	Yes	E10 Philips IU22	Intellispace Unsure
1	Director of Nursing	10	Yes	Yes	GE Voluson E10	Unsure
J	Nurse Practitioner	n/a	Yes	No	GE Voluson E6	None
К	Imaging Quality Supervisor	8	Yes	Yes	GE Voluson E10	McKesson
L	Sonographer	8	Yes	Yes	Philips IU22	Unsure
М	Sonographer	10	Yes	Yes	GE Voluson E10	McKesson
N	Sonographer	10	Yes	Yes	GE Voluson E10	McKesson
0	Ultrasound Supervisor	10	Yes	Yes	GE Voluson Expert 20	Study Cast and Intergi
Р	Sonographer	9	Yes	No	Philips Epic Elite	McKesson
Q	Practice Manager, RN	8	Yes	Yes	GE Voluson E8	Viewpoint
R	Practice Manager, RN	10	Yes	Unsure	GE Voluson E10, E6, E22	Viewpoint
S	Sonographer	10	Yes	Yes	GE Voluson E10	McKesson
Т	Sonographer	8	Yes	Yes	GE Voluson E8	Core Sound Imaging
U	Manager of Medical Imaging	8	Unsure	No	GE Logic 10	Spectrum
V	Sonographer	9	Yes	No	GE Voluson E10	Viewpoint and McKesson
W	Sonographer	9	Yes	Yes	Siemens	Nova
Х	Sonographer	10	Yes	No	GE Voluson E6	Greenway
Υ	Director of Radiology	7	Yes	Yes	Canon i700	Nova

#3 Langerhans Cell Histiocytosis Masquerading as Refractory Intertriginous Rash

Nicole Wozny^{1,2}, Hana Niebur^{1,2}, Morgan Zabel³, Nicole Harter³

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Mentor: Hana Niebur **Program:** Pediatrics **Type:** Case Report

Background: Langerhans's cell histiocytosis (LCH) is characterized by infiltration of Langerhans cells into various organs of the body. Up to 40% of those with LCH have an eczematous rash involving intertriginous sites.

Case: We present the case of a 4-month-old male with refractory intertriginous dermatitis that did not respond to eczema or antifungal therapy. Figure 1 shows the rash in his left axilla. Due to concern for chronic mucocutaneous candidiasis, Allergy/ Immunology referral was requested. Additional findings included bloody stools leading to a diagnosis of milk soy protein intolerance and early tooth eruption at 2 months of age with gingival friability and immune evaluation showed CD8 lymphopenia. Skin scraping failed to demonstrate Candida. Dermatology evaluation was requested. A gingival biopsy was obtained, ultimately leading to a diagnosis of LCH with multisystem involvement. Chemotherapy was urgently initiated.

Conclusion: Erosive oral mucosal changes and maceration and erythema of intertriginous sites seen in LCH can mimic refractory cutaneous candidiasis, atopic dermatitis, or seborrheic dermatitis. LCH can be divided into single system versus multisystem disease, with high-risk organ involvement including bone marrow, liver, and/or spleen. Intestinal involvement can also occur. Diagnosis of LCH can be challenging due to rarity of the disease and high index of suspicion required to diagnose this condition. Biopsy is vital in the evaluation of chronic dermatitis that does not improve with usual therapy.

When typical treatment for seborrheic or atopic dermatitis fails, concern for LCH should be raised. Due to high mortality, a strong index of suspicion is vital to expedite biopsy, treatment, and increase survival.



Figure 1. Macerated pink plaque in left axilla.

#4 Surgical Outcomes and Decision Making for Bicuspid Aortic Valve

Adam Larsen¹, David Danford¹, Angela Yetman¹

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Mentor: Angela Yetman

Program: Pediatrics – Cardiology

Type: Original Research

Background: Bicuspid aortic valve (BAV) is the most common congenital heart lesion and is associated with aortic stenosis or regurgitation, endocarditis, and/or ascending aorta dilation. Surgical interventions include pulmonary autograft (Ross procedure), aortic valve replacement (mechanical or bioprosthetic), and aortic valve repair.

Methods: Single-center cohort study included 152 adults with BAV who underwent interventions during childhood. Cohorts were defined as those who underwent "nondefinitive" intervention only (balloon or surgical aortic valvuloplasty) and by first "definitive" intervention – Ross procedure, aortic valve replacement (mechanical or bioprosthetic), and aortic valve repair. Measured outcomes included durability of surgical intervention and incidence adverse outcome.

Results: Of the total 152 patients, 62% were male. Females were more heavily represented in the Ross cohort, with 32 out of 70 patients (45%) being women. A total of 35 patients underwent "non-definitive" intervention only and 117 patients underwent "definitive" intervention: Ross procedure (61), mechanical aortic valve replacement (27), bioprosthetic aortic valve replacement (19), or surgical aortic valve repair (17). Patients who underwent balloon aortic valvuloplasty were more likely to undergo mechanical aortic valve replacement as first definitive procedure. Aortic valve repair and bioprosthetic valve replacement were more associated with major adverse events and required earlier repeat definitive procedure. Ross procedure and mechanical aortic valve replacement were comparable in freedom from death, transplant, or repeat definitive procedure.

Conclusion: Ross procedure and mechanical aortic valve replacement were superior to other definitive procedures and have similar outcomes. Females were more likely to undergo Ross procedure as the first "definitive" procedure than mechanical aortic valve

#5 Red Blood Cell Transfusion Causes Brain Inflammation in Murine **Pups With Phlebotomy Induced Anemia**

Pramod Shrestha^{1,2,3}, Eric Peeples^{1,2,3}, Balamurugan Ramatchandirin⁴, Gwenn Skar^{2,3,5} Mohan Kumar Krishnan^{1,3,4}

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⁵Department of Pediatrics, Division of Pediatric Infectious Diseases, College of Medicine, University of Nebraska Medical Center, Omaha, NE

Mentor: Eric Peeples

Program: Pediatrics – Neonatology

Type: Original Research

Background: Anemia is common in premature infants, with RBC transfusion as the treatment for severe cases. Clinical and animal studies suggest a link between anemia, blood transfusion, and brain inflammation. While severe anemia has caused hippocampal injury in animals, the impact of RBC transfusion on brain inflammation post-anemia remains unclear. To identify the inflammatory changes in the neonatal mouse brain of phlebotomy induced anemia and RBC transfusion.

Methods: C57BL/6 pups were divided into 4 groups: naïve control, RBC transfused, severe anemia, and severe anemia with RBC transfusion. Severe anemia was induced by facial vein phlebotomy on days 2, 4, 6, 8, and 10. RBC transfusion (20 ml/kg) of leukoreduced, stored packed RBC from FVB/NJ donor adult mice was administered intravenously on postnatal day 11 (P11). Brain tissue was collected 24 hours post-transfusion, and protein concentration was measured by bicinchoninic acid (BCA) assay. Cytokines and chemokines were quantified using Milliplex Map Mouse assay. Immunostaining with Ly6c and Iba-1 antibodies was performed to detect monocyte recruitment and microglial activation. Monocyte recruitment in anemic-transfused brains was analyzed by flow cytometry.

Results: Inflammatory cytokines IL-1 α , IL-1 β , IL-6, TNF- α , and IL-12p70 were higher in brain tissues of anemic-transfused mice pups as compared to controls, while IL-4 and IL-5 levels remained unchanged. Chemokines MCP1, MIP1-α, MIP1-β, RANTES, and Eotoxin were also elevated. Immunostaining revealed increased Ly6C+ monocytes and activated microglia (Iba1+) in the anemictransfused brain. Flow cytometry confirmed the presence of CD11b+CD45+Ly6C+ monocytes in the anemic-transfused brain.

Conclusion: RBC transfusion increases the inflammatory response in murine pups' brains with severe anemia.

#6 Characterizing Prostate Cancer Stage Migration and Subsequent Treatment Implications in the PSMA PET Era

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Mentor: Michael Baine

Program: Radiation Oncology

Type: Original Research

Background: Until recently, prostate cancer staging has been predicated primarily on physical exam, CT, MRI, and bone scans. Prostate-specific membrane antigen positron emission tomography (PSMA PET) is a more sensitive and specific study for the delineation of nodal and distant metastatic disease. PSMA PET was added to National Comprehensive Cancer Network guidelines as the recommended modality for assessment of metastatic disease in 2021. The aim of this paper is to determine the impact of this new imaging modality on prostate cancer staging and subsequent treatment decisions compared to historical imaging standards in a single institution patient cohort.

Methods: A total of 206 patients with treatment-naïve prostate cancer underwent PSMA PET for the detection of metastatic disease between January 2021 and March 2024. Scans were retrospectively evaluated for PET avid lymph nodes and distant metastases. A lymph node size cutoff of ≥1cm on CT was used as the historical standard for a pathologic lymph node. Bony PET avidity was also assessed for a CT correlate. (Ethical approval for this retrospective study was obtained: IRB 398-17-EP)

Results: Of the 49 patients with nodal involvement on PSMA PET, 24 did not have CT-detectable disease. The average size of PSMA avid lymph node without pathologic node on CT was 6.8mm. 33.3% of all patients with 3a/3b disease by MRI had PSMA positive lymph nodes. Five patients were found to have PET avid bony metastases without a CT correlate. A total of 29 patients (14.1%) were upstaged via PSMA PET imaging.

Conclusion: PSMA PET may impact prostate cancer staging and treatment options that could be different from what would have been offered in the pre-PSMA PET era.

#7 Double Trouble: Coexistence of Hodgkin and Non-Hodgkin Lymphoma With Chronic ITP and Cryptic Brain Metastasis

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Mentor: Snegha Ananth

Program: Internal Medicine – Oncology & Hematology

Type: Case Report

Background: Hodgkin lymphoma (HL) and splenic marginal zone lymphoma (SMZL) can be clonally related, sharing identical V gene rearrangements, suggesting a potential evolutionary link. Hematological malignancies, including HL and SMZL, are associated with immune thrombocytopenia (ITP). ITP is rare in HL, occurring in 0.29% at presentation and 0.7% during follow-up. ITP is more common in SMZL. and is often treated with splenectomy. ITP can be the only clinical sign and precede lymphoma by months or years, or it can be concomitant to lymphoma diagnosis. Both HL and SMZL rarely involve the central nervous system with few reported brain metastases

Case: A 65-year-old male with chronic ITP and prostate cancer on androgen deprivation therapy, presented with low back pain and a platelet count of zero after a fall. Imaging showed hemorrhagic brain lesions. PET-CT revealed an FDG-avid inguinal lymph node, confirmed as HL, mixed cellularity type. Despite Dexamethasone, IVIG, and Romiplostim, platelet levels remained low. Splenectomy revealed SMZL, but platelet response was poor. Treatment with mycophenolate mofetil (MMF) and Promacta was ineffective. MMF was discontinued, and Rituxan was initiated for both ITP and SMZL. Despite Eltrombopag and Rituximab, platelet levels stayed low. Nivolumab and Bendamustine were considered, with Bendamustine initiated due to its activity against both lymphomas and modest CNS penetration. Response assessment is pending, and a brain mass biopsy is planned once platelet levels recover. The patient remains asymptomatic.

Conclusion: This case highlights the diagnostic and management complexities of refractory ITP, influenced by SMZL or HL, complicating the path to definitive diagnosis and treatment

#8 Improving Diagnostic Precision in Thyroid Pathology by Synergistic Use of Al and Molecular Markers

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Mentor: Anupam Kotwal

Program: Internal Medicine – Diabetes, Endocrinology & Metabolism

Type: Original Research

Background: Molecular marker tests offer high negative predictive value (NPV) for indeterminate thyroid nodules, reducing missed malignancies, but have limited positive predictive value (PPV) leading to unnecessary surgeries. Artificial intelligence-based imaging (AIBx) models could improve specificity.

We sought to evaluate whether integrating AIBx results with molecular markers could enhance diagnostic accuracy.

Methods: We retrospectively analyzed 108 indeterminate thyroid nodules undergoing 'ThyroSeq' molecular testing. Surgical pathology was available for 42 nodules; and remaining 66 were deemed benign for analytic purposes. We calculated sensitivity, specificity, PPV, NPV, and area under the receiver operating characteristic curve (AUC) for three strategies: AIBx alone, ThyroSeq alone, and combined approach (AIBx+Mol). In combined approach, when ThyroSeg reported "Malignant" but estimated malignancy probability was intermediate or under, the final classification deferred to AIBx. Otherwise, the ThyroSeq result was retained. The IRB numner of the study is 0191-22-EP.

Results: In the subset with surgical pathology (n = 42), ThyroSeq demonstrated high sensitivity (0.95) but moderate specificity (0.45), with PPV of 0.65. AIBx alone improved specificity (0.60) but had lower sensitivity (0.77). The AIBx+Mol retained high sensitivity (0.95) while raising specificity to 0.60, improving PPV to 0.72 and AUC from 0.70 (ThyroSeq) to 0.77.

In the entire cohort (n = 108, with nodules lacking pathology considered benign), AIBx+Mol maintained excellent sensitivity (0.95) and enhanced specificity 0.90 vs 0.87, PPV 0.72 vs 0.65, and AUC 0.93 vs 0.91, as mentioned in **Table 1**.

Conclusion: Integrating AIBx imaging with molecular marker results, preserved high sensitivity of molecular testing while significantly improving specificity and PPV. This synergy may reduce unnecessary surgeries prompted by false-positive molecular findings, ultimately improving clinical decision-making and patient outcomes

Table 1. Full data analysis results of thyroid nodules.

Test	AIBx	ThyroSeq	AlBx+Mol
Sensitivity	0.7727	0.95454	0.95454
Specificity	0.76744	0.87209	0.906976
PPV	0.45945	0.65625	0.72413
NPV	0.92957	0.98684	0.987341
AUC ROC	0.7700	0.91331	0.93076

#9 Health Disparities Among Patients Referred to Multidisciplinary **Heart Failure Clinic: A Retrospective Analysis**

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Mentor: Scott Lundgren Program: Internal Medicine

Type: Original Research

Background: Multidisciplinary heart failure clinics improve Guideline Directed Medical Therapy (GDMT) utilization and heart failure outcomes. Our study examines health disparities and heart failure outcomes among patients who were referred to our multidisciplinary OPTIMIZE-HF Clinic (OHFC).

Methods: Patients referred to OHFC were categorized into Completion (COM) and No Show (NS) groups based on attendance. Demographics, GDMT utilization, heart failure metrics, and outcomes were collected at baseline and follow up. Data was compared between COM and NS groups using the Chi-square test or the independent sample t-test as appropriate.

Results: A total of 330 patients comprised the COM group, and 230 patients were in the NS group. NS patients were more likely (p < 0.05) to have Medicaid or no insurance and more likely to be black. The NS group also had poorer social support as identified by single marital status and lack of alternative contact on file. They were also more likely to reside in census tracts with lower household incomes and have previous or current housing issues. Significant (p < 0.05) benefits were seen in heart failure metrics in the COM group, including decreased total and heart failure hospitalizations, greater improvement in left ventricular ejection fraction, and increased overall GDMT use

Conclusion: Marginalized patients are less likely to engage with multidisciplinary heart failure clinics, warranting further research into equitable access and outcomes among various groups.

#10 Chronic Immunosuppression May Increase the Risk of Coronary **Artery Perforation in Patients Undergoing CTO-PCI**

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Mentor: Edward O'Leary

Program: Internal Medicine – Cardiology

Type: Case Report

Background: The risk of coronary perforation (CP) during percutaneous coronary intervention (PCI) has been reported to be less than 1%. This risk increases with an odds ratio of 3.7 in patients on chronic steroid treatment. A risk of 3.7% to 8.9% has been reported for those undergoing PCI of chronic total occlusions (CTO). Multiple risk factors for CP during PCI of CTOs have been identified, however, chronic steroid use has not been reported in this group.

Case: An 80-year-old male with a history of coronary artery disease (CAD), peripheral artery disease, smoking, and chronic steroid immunosuppression following three kidney transplants presented with complaints of chest pain. Cardiac catheterization demonstrated multivessel coronary artery disease with CTO of the right coronary artery (RCA) and first obtuse marginal branch (OM). The patient was declined for coronary artery bypass graft (CABG) due to comorbidities. Attempts to open the CTOs of the RCA and OM failed. He, unfortunately, re-presented soon after with a non-ST-elevation myocardial infarction. Repeat coronary angiography was unchanged, and right heart catheterization was consistent with constrictive physiology. Cardiac computed tomography scan demonstrated a hyperdense pericardial effusion presumably related to the prior PCI. Pericardiocentesis and subsequent limited surgical washout of the pericardium were unsuccessful. He then underwent sternotomy for removal of pericardial thrombus with possible CABG. The CABG was aborted due to difficulty achieving hemostasis, with poor and friable targets and inadequate conduits.

Conclusion: There is a higher risk of coronary artery perforation in patients on chronic steroid immunosuppression therapy undergoing PCI.

#11 Ventricular Tachycardia Ablation in Patients With Valvular Heart Disease

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Mentor: Ammar Killu

Program: Internal Medicine - Cardiology

Type: Original Research

Background: Data regarding ventricular tachycardia (VT) ablation in patients with valvular heart disease is limited. We aimed to investigate the characteristics and outcomes of catheter ablation (CA) in this patient population.

Methods: Following institutional review board approval, we identified consecutive patients with aortic and/or mitral valve disease (severe stenosis/ insufficiency or surgery) who underwent CA for VT between January 2013- December 2018. We investigated the mechanism of arrhythmia, ablation approach and outcomes.

Results: In our cohort, 63 patients (87% men, mean age 66 ± 11 years, left ventricular ejection fraction 28% (IOR 20,40)) with left-sided valvular disease underwent CA for VT. VT substrates involved the peri-valvular area in 38% of patients. VT ablation was successful in 92% of the patients. Apart from 1 case of femoral pseudoaneurysm, no procedure-related complications were reported. Recurrence-free survival at 1-year was 47% (Figure 1A). There was no significant difference in recurrence-free survival between patients with prior aortic vs mitral valve surgery (P = 0.50) (Figure 1B), ischemic vs non-ischemic cardiomyopathy (P = 0.19) (Figure 1C), low vs preserved ejection fraction (P = 0.34) (Figure 1D), presence or absence of severe tricuspid regurgitation (P = 0.97) (Figure 1E).

Conclusion: CA of VT can be performed safely in patients with structural heart disease with an excellent acute success rate. The recurrence rate is slightly lower in this population compared to reported rates in literature for general population.

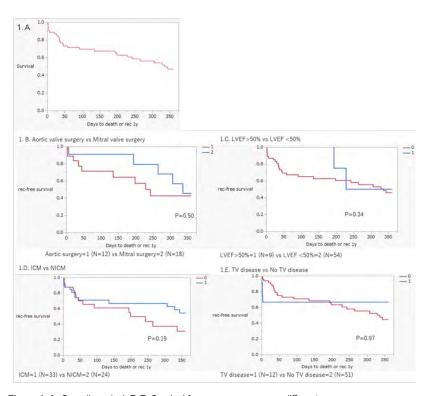


Figure 1. A, Overall survival; B-E, Survival-free recurrence among different groups.

#12 Endovascular Management for Refractory Hepatic Encephalopathy After Transjugular Intrahepatic Portosystemic Shunt (TIPS) Creation

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Mentor: Lei Yu

Program: Interventional Radiology

Type: Original Research

Background: Hepatic encephalopathy (HE) is commonly seen in patients who have undergone transjugular intrahepatic portosystemic shunt (TIPS) placement for variceal bleeding and/or refractory ascites. Most patients with mild HE respond well to medical management alone. However, a small percentage develop refractory HE despite maximal medical therapy and require liver transplantation or endovascular intervention such as TIPS reduction or occlusion.

Case: TIPS is pivotal in managing portal hypertension and its sequelae, including variceal bleeding and refractory ascites. While highly effective at reducing portal pressures, new or worsening HE is frequently encountered post-TIPS placement. Diversion of portal venous flow from the liver and the loss of hepatic ammonia filtration lead to hyperammonemia and HE. Dietary modification, lactulose, and rifaximin are first-line treatments for mild HE. Refractory HE requires endovascular intervention to occlude or downsize the portosystemic shunt.

Shunt occlusion is achieved by placing coils or a vascular plug within TIPS but is generally avoided due to the risk of fatal sequelae, including recurrent variceal bleeding. Multiple shunt reduction techniques have been described. Two main types of reduction (parallel and hourglass techniques) use a bare metal stent or stent graft and will be discussed using schematic illustrations. Case presentations will highlight clinical management, decision-making, key technical steps, stent selection, fluoroscopic monitoring for intraoperative complications, and post-procedure management.

Conclusion: Refractory HE is a serious complication of TIPS and can be successfully managed with endovascular interventions. Understanding TIPS reduction techniques is crucial for optimizing patient outcomes based on individual anatomy and clinical circumstances

#13 Antibiotic Prescription Practices in Revision Finger Amputations

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Mentor: Joseph Morgan

Program: Orthopaedic Surgery

Type: Original Research

Background: Revision finger amputations are often performed at the bedside in the Emergency Department (ED). Unlike open fracture guidelines, there is not a standardized protocol for antibiotic administration following revision finger amputation. The objective of this study was to evaluate antibiotic prescription practices in revision finger amputations in order to optimize protocol development.

Methods: A retrospective IRB-exempt chart review of patients who underwent primary revision amputation of at least one digit at a single tertiary Level 1 Trauma Center ED from October 2020 to May 2024 by an orthopedic surgery resident was conducted. Patient demographics, injury mechanism, procedure details, ED antibiotic and tetanus administration, discharge antibiotic type and duration, and post-procedural course were recorded. Patients younger than 19 years of age, incarcerated, or immunosuppressed at the time of procedure were excluded.

Results: Ninety-three patients met the study criteria. Eighty-four patients (90.3%) received antibiotics, and 65 (69.9%) received tetanus immunization in the ED. Of the 84 patients who received ED antibiotics, 70 (83.3%) received cefazolin, 9 (10.7%) received ceftriaxone, and 5 (0.06%) received ampicillin/sulbactam. Eightythree patients (98.8%) received post-procedural antibiotics, including 62 (74.6%) discharged on trimethoprim/sulfamethoxazole and 17 (20.5%) on cefalexin with a mean initial duration of 9.7 days (range 7-14 days).

Conclusion: Revision finger amputations are commonly performed in the emergency setting. The majority of patients received cefazolin in the ED and 10 days of trimethoprim/sulfamethoxazole upon discharge, although variation in antibiotic type and duration was noted. Expansion of the study period and detailed analysis of outcomes will allow for the development of a standardized antibiotic protocol.

#14 Analysis of Female Medical Student Matriculation Into Orthopaedic Surgery Nationally by Medical School

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Mentor: Sara M. Putnam

Program: Orthopaedic Surgery

Type: Original Research

Background: Despite the achievement of gender parity within medical schools. orthopaedic surgery residencies remain one of the lowest matriculation rates for women. This project categorizes individual medical schools' female orthopaedic match rates to improve understanding of this bottleneck in the field's diversity.

Methods: All United States allopathic and osteopathic medical schools publicly available match data was analyzed by applicant gender. Both two-tailed t-tests and one-way ANOVA were performed for statistical analysis (p < 0.05).

Results: From 58 medical schools, 491 female applicants matriculated into orthopaedics (18.2%) with no significant difference between medical school regions. The school with the highest proportion of female matriculants was Albany Medical College with 42.1%. Four schools lacked any female matriculants despite matching 16 students. The variance of the sample set was analyzed for schools with at least 10 and 15 years of data. The two schools with at least 10 years of data and the highest proportion of female matriculants were Texas Tech University Health Sciences Center in El Paso (31.03%) and the University of Minnesota (29.42%). The three lowest schools were the University of Nebraska (7.32%), the University of Mississippi (3.49%), and the University of Oklahoma-Tulsa (0%). The variance between the highest and lowest matriculation rates with match results for at least 10 years (p = 0.004) and 15 years (p = 0.030) was significant (**Figure 1**).

Conclusion: There exists great variability in female medical student matriculation into orthopaedics based upon medical school. Despite limitations of the publicly available data, characterizing this variability further is important in the multitude of efforts working towards gender equity in the orthopaedic profession.

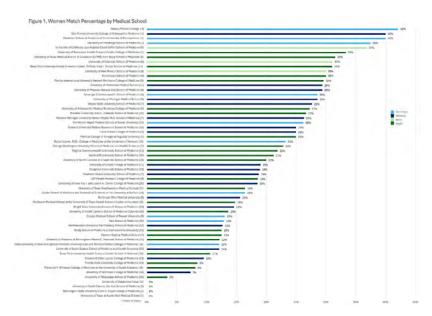


Figure 1. Women march percentage by medical school.

#15 Exploring Barriers to Pre-Clinical Female Medical Student Involvement in Orthopaedics at a Single Institution

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Mentor: Sara M. Putnam

Program: Orthopaedic Surgery

Type: Original Research

Background: Orthopaedic surgery remains the one of the least diverse specialties within medicine. Within our academic institution, a small quantity of faculty (8%), residents (19%), and medical student graduates over the last 24 years (7.3%), identify as females.

Methods: During two Ruth Jackson Orthopaedic Society chapter meetings at our institution, a survey designed to assess female pre-clinical medical students' previous exposure and perceptions of the field of orthopaedics was administered.

Results: All 20 students surveyed identified as female M1 or M2 students. The students self-identified as being "moderate, pretty sure, or definite" in their pursuit of an orthopaedic career. Five students identified being exposed to orthopaedics during early childhood, five were exposed in high school, and ten encountered the field in college. To date, the pre-clinical students were identified as having zero (1), minimal (4), moderate (10) or "a lot" of (5) experience in orthopaedics. These experiences came from shadowing (19), research (6), scribing (4), or athletic training (1). One student noted not having any clinical or research experience. Students were evenly divided between considering surgical skills (5), research opportunities (6), or mentorship (5) as most important to their development. Of the 20 students included in the survey, 60% of students identified work-life balance and 55% of students mentioned the lack of female role models as significant barriers to pursuing orthopaedics.

Conclusion: Pre-clinical female medical students interested in orthopaedics expressed similar concerns regarding barriers to pursuing a career in orthopaedics, including work-life balance, a lack of female mentors, and the competitive nature of applications.

#16 A Novel Multi-Disciplinary Opioid Tapering Program for Standardized Post-Operative Opioid Use

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Mentor: Christopher Deans Program: Orthopaedic Surgery

Type: Original Research

Background: As the third leading prescriber of opioid medications, orthopedic surgeons serve a critical role in addressing the opioid epidemic. The goal of this study is to analyze current opioid prescribing practices for post-operative primary total knee arthroplasty (pTKA) and primary total hip arthroplasty (pTHA) patients at a single academic institution. This information will be used to develop a novel multidisciplinary opioid tapering program for use in pTKA and pTHA populations.

Methods: A retrospective review of opioid prescribing trends post-operatively during hospitalization and upon discharge for patients undergoing pTKA (n = 167) and pTHA (n = 121) was conducted at a single academic institution. Descriptive statistics were used to summarize the demographic and clinical characteristics of the patients.

Results: Patients undergoing pTKA require an increased number of refills, total morphine milligram equivalents (MME) refilled, and total MME used when compared to pTHA. For those undergoing pTKA, females required increased total MME and chronic opioid users required increased in-hospital MME/day. For those undergoing pTHA, an increase in total MME used was identified in those <70 years old, mental health diagnosis, and chronic opiate users. For pTKA and pTHA, the total MME used was separated into quartiles to identify utilization patterns for protocol development (Table 1).

Conclusion: This study describes patterns in opioid use for pTKA and pTHA at a single high-volume academic institution. Future goals of this study include working with pharmacy and Information Technology to set discharge opioid prescription counts with a described standard refill protocol for opioid tapering based on predicted opioid utilization determined by pre-operative factors.

Table 1. MME distribution for ordering and use.

MME Distribution for Ordering and Use: Post-Op and Discharge, pTKA

MME amount								
Timing of Order/Use	N	Mean	Minimum	25th Pctl	Median	75th Pctl	Maximum	
Post-op Ordered	167	108.28	0.00	45.00	102.50	170.00	330.00	
Post-op Used	167	43.51	0.00	15.00	35.00	65.00	172.00	
Total Discharge ordered	167	484.24	0.00	525.00	525.00	525.00	787.50	
Total Discharge used	167	1331.73	106.40	565.00	1065.00	1637.50	12195.50	

MME Distribution for Ordering and Use: Post-Op and Discharge, pTHA

MME amount								
Timing of Order/Use	N	Mean	Minimum	25th Pctl	Median	75th Pctl	Maximum	
Post-op Ordered	121	113.62	3.80	85.00	120.00	170.00	290.00	
Post-op Used	121	37.47	0.00	15.00	30.00	52.50	142.50	
Total Discharge ordered	121	464.88	0.00	450.00	525.00	525.00	975.00	
Total Discharge used	115	978.48	7.50	533.50	583.80	1102.50	11025.00	

#17 A Quality Improvement Initiative: Retrospective Analysis of Impact of Cytogenetics in Orthopedic Oncologic Diagnosis and Subsequent Management

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Mentor: Sean McGarry

Program: Orthopaedic Surgery

Type: Original Research

Background: Limited information exists regarding the efficacy of traditional cytogenetics within surgical oncologic specialties, specifically orthopaedic oncology. Furthermore, this time-consuming, costly process requires fresh tissue which must be decided to obtain in the operating room unlike the multitude of molecular tests that are often used when a diagnosis is not histologically distinguishable. This study retrospectively reviews a single institution's cases to assess the clinical utility of traditional cytogenetics.

Methods: An IRB-approved retrospective chart review of all orthopaedic oncology patients from the last 5 years who had cytogenetics ordered for fresh surgical tissue.

Results: A total of 154 charts were reviewed over the study period. An attending pathologist deemed only 4 cases appropriate to order in the cases of lymphoma, myxoid liposarcoma (2), and synovial sarcoma. There were only two lymphoma cases where cytogenetics was ordered, not completed and deemed reasonable to order. Most orders were canceled by a pathologist prior to completion (87). Other common results were normal cytogenetics (30), not necessary for diagnosis (23), technical failure of cytogenetics (10).

Conclusion: Cytogenetics rarely provided unique information in the setting of orthopaedic oncology tumor diagnosis with lymphoma cases being a typical exception to this conclusion. This information will be used to assist future clinical decision making to improve delivery of cost-effective, high quality patient care and effective care coordination in orthopaedic oncology patients.

#18 Increased Utilization of Assistive Reproductive Technologies **Amongst Female Orthopedists**

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Mentor: Sara Putnam

Program: Orthopaedic Surgery

Type: Original Research

Background: Female orthopedists face infertility at a higher rate than the general population. Therefore, we aimed to assess the usage of assistive reproductive technologies (ART) by female orthopedists, as well as the financial burden of these treatments

Methods: An anonymous survey was distributed to female orthopedists. Categorical variables were compared using chi-squared or Fisher's exact test. Continuous variables were compared using either the two-sample t-test or the Wilcoxon rank sum

Results: A total of 147 individuals responded, with an average age of 37.5 years old. Forty-three respondents (29.6%) had been diagnosed with infertility at an average age of 33.4 years old at diagnosis, which represents a significantly higher incidence of infertility (p < 0.001) at a younger age compared to the general population (p = 0.0019). Sixty-one women had utilized elective fertility preservation or had ART-assisted pregnancies. Relative to the general population, female orthopedists undergo ART procedures more frequently (p < 0.03). Based on employer type, female orthopedists in non-academic positions paid significantly more out of pocket for ART treatments than female orthopedists in academic positions (p = 0.0018).

Conclusion: We found that there was a high number of women in orthopedics that utilized ART for fertility preservation or to become pregnant and that female orthopedists undergo these procedures more often than the general population. Relative to the increasing benefits for fertility treatments in the corporate world, healthcare employers are lagging behind, and this may be a contributing factor to the difficulty of recruiting and retaining women into orthopedics.

#19 The Effect of Travel Load on Minor League Baseball (MiLB) Injuries Part 1: Total Injury Frequency

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Mentor: Jason Meredith Program: Family Medicine

Type: Original Research

Background: Travel fatigue is an accumulative disorder due to repetitive travel over a season that results in a buildup of injuries in athletes. A major change in the Minor League Baseball (MiLB) schedule occurred for the 2021 season that reduced cumulative travel load; we hypothesized that it also reduced the number of injuries.

Methods: A retrospective cohort study analyzed data from MiLB players using a public database from four seasons pre-schedule change (2016-2019) and four seasons post-schedule change (2021-2024) at each level of baseball (AAA, AA, A+, A). A paired t-test was used for analysis with an alpha level of 0.05.

Results: Exposures were calculated by primary position played. Pre-schedule change, 7733 injuries occurred across 858,829 exposures; post-schedule change, 6430 injuries occurred across 844,172 exposures. There was a statistically significant reduction in the total injuries on the injured list (IL) post-schedule modification (p = 0.008), with a moderate effect size (Cohen's d = 0.76). Total days on the IL decreased from 291,544 pre-schedule change to 269,760 post-change, though not significantly (p = 0.103). Average days per injury increased slightly but not significantly (p = 0.088).

Conclusion: The schedule modification implemented in minor league baseball appears to have led to a statistically significant reduction in the overall number of injuries. The findings also indicate that there is a need for further strategies to address injury severity and duration. This is the first study to link scheduling associated travel load to injury frequency. Our data may be extrapolated to other leagues to assist medical staff in advocating for their athletes' health and wellbeing.

#20 The Effect of Travel Load on Minor League Baseball (MiLB) Injuries Part 2: Injury Frequency by Position

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Mentor: Jason Meredith Program: Family Medicine

Type: Original Research

Background: Travel fatigue is an accumulative disorder due to repetitive travel over a season that results in a buildup of injuries in athletes. A major change in the Minor League Baseball (MiLB) schedule occurred for the 2021 season that reduced cumulative travel load. The purpose of this study was to observe the effect of travel load on position specific injury frequency.

Methods: A retrospective cohort study analyzed data from MiLB players using a public database from four seasons pre-schedule change (2016-2019) and four seasons post-schedule change (2021-2024) at each level of baseball (AAA, AA, A+, A). Data was further separated by position: pitchers, catchers, infielders, and outfielders. An ANOVA analysis was used for comparison between positions.

Results: Exposures were calculated by primary position played. Pre-schedule change, 7733 injuries occurred across 858,829 exposures; post-schedule change, 6430 injuries occurred across 844,172 exposures. According to the ANOVA analysis, there was a significant position by schedule change interaction effect across all variables (p < 0.05). In the post-schedule change period, pitchers saw a statistically significant increase in the ratio of injuries, whereas position players saw a significant decrease in the ratio of injuries.

Conclusion: The schedule modification implemented in minor league baseball appears to have led to a statistically significant reduction in the overall number of injuries. The findings indicate that while the schedule change alleviates injury frequency among MiLB players, there is a need for further strategies to address injury severity and duration, particularly for pitchers.

#21 Is Green the New Red (Is Dead): Ischemic Myocardial Necrosis Highlighted in Patients With Liver Failure

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Mentor: Stanley Radio **Program:** Pathology

Type: Original Research

Background: Color and pigment of tissue are essential components of the gross evaluation of organs, often providing valuable clues to diagnosis. Some patients with liver failure have been found to have green pigmentation in areas of myocardium secondary to infarction, which has not been previously characterized in standard cardiac pathology literature.

Methods: A natural language search of the anatomic pathology system was performed for patients (GREEN) who, over the last ten years, had green discoloration (GD) or pigment of the epicardium, myocardium, or epicardium. All 25 patients identified had liver failure (20 chronic, 5 acute fulminant). A group (RED) of agecomparable patients with acute myocardial infarction without chronic liver disease was identified

Results: The GREEN group had higher hyperbilirubinemia (mean 20.9 ng/ml) and greater duration of jaundice (mean 39.1 days). In the GREEN group, GD was present in the myocardium in 23/25 (92%). Acute myocardial injury was present microscopically in 10/23 (43%) GREEN patients with GD.

Conclusion: GD can be seen in all layers of the heart in patients with acute and chronic liver failure. Discrete darker green regions in the myocardium often outline regions of acute and healing ischemic injury.

#22 A Tough NUT to Crack: An Institutional Review of Multifocal NUT Carcinomas

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Mentor: David Wagner **Program:** Pathology Type: Original Research

Background: Nuclear protein of the testis (NUT) carcinoma is a rare, aggressive neoplasm predominantly affecting midline structures and is largely resistant to chemotherapy treatments. Overall survival is poor, and metastasis to locoregional and isolated distant sites have been reported.

Methods: An institutional search using CoPath software was used to review cases diagnosed as NUT carcinoma. Specifically, the natural language search feature pulled all in-house surgical cases with biopsy or resected tissue workup for which NUT carcinoma was subsequently diagnosed.

Results: Three cases were identified, evidenced by rearrangement of *NUTM1* by fluorescence in situ hybridization (FISH) studies along with immunohistochemical (IHC) staining. One case was novel due to diagnosis in the breast, a situation never described in literature. Specifically, the 71-year-old female presented nine months after her initial lung primary NUT carcinoma diagnosis with an increasing breast mass for which IHC staining on biopsy showed positivity for NUT, CAM5.2, and EMA, consistent with NUT carcinoma. Confirmatory FISH studies showed the same NUTM1::BRD4 fusion as the initial lung tumor.

Conclusion: We present a novel case of the first documented case of metastatic NUT carcinoma to the breast. Our study supports reporting NUT carcinoma cases to help understand its etiology and improve clinical outcomes.

#23 t(9;14)(p13;q32) Lymphomas: Case Series and Review of the Literature

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Mentor: Arash Ronaghy

Program: Pathology - Hematopathology

Type: Original Research

Background: Paired Box 5 (PAX5) on chromosome 9p13 is essential in B lymphoid maturation and plays a role in B-cell neoplasia. Rare cases of diffuse large B cell lymphoma (DLBCL) have been reported to harbor *IGH::PAX5* fusion resulting from the balanced translocation t(9;14)(p13;q32). In this study, we analyze a series of B-cell lymphomas harboring *IGH::PAX5* and their clinicopathologic and molecular features.

Methods: We searched our database from 12/2010-02/2024 for lymphomas harboring t(9;14)(p13;q32). *IGH* and *PAX5* rearrangement was confirmed by Fluorescence In Situ Hybridization (FISH) using break-apart probes, and PAX5 expression was evaluated by immunohistochemistry. Mutation profiling was performed using Next Generation Sequencing (NGS). IRB protocol: IRB-0680-22-EP, Approval date: 09/06/2023.

Results: Four patients (3 women; 1 man) with a median age of 65 years (57-70 years) (Table 1). Two patients were diagnosed with marginal zone lymphoma (MZL), one with DLBCL, non-germinal center B-cell subtype (DLBCL, non-GCB), and one with high-grade B-cell lymphoma (HGBCL). All patients had splenomegaly and lymphadenopathy. The neoplastic cells expressed PAX5 and MUM1 by immunohistochemistry and FISH confirmed PAX5 and IGH rearrangements in all cases. Genomic profiling of the HGBCL demonstrated the following pathogenic mutations: ARID1A p.Q185* (VAF 45.8%), NOTCH2 p.Q2361* (VAF 35.4%), FUBP1 p.Y58* (VAF 22.9%), SETD2 p.T1870Rfs*16 (VAF 22.7%), and a CDKN2A deletion. One of the MZL cases showed multiple variants of undetermined significance including NOTCH1, DNMT3A and TET2.

Conclusion: Our data show a variety of B-cell lymphomas with *IGH::PAX5*, including MZL, DLBCL, and HGBCL and this fusion was detected in association with a number of deleterious genomic alterations.

 Table 1. Clinicopathologic features, cytogenetics and IGH molecular testing of lymphoma cases.

Case No.	Age /Sex	Dx	Death	Clinical Features	Treatment	Flow Cytometry Results	Karyotyping	IGH BAP FISH	PAX5 BAP
1	67F	MZL	N/A	Bilateral PL, anemia, SPM with splenectomy, BM involvement	N/A	Pleural fluid: CD45, CD19, CD20, CD11b, CD11e, Kappa. Bone marrow: CD45, CD19, CD20, Kappa.	Bone marrow: 56,XXX,1(9;14)(p13;q32)[9]/46,XX[12]	Bone marrow: 26.5%	Not tested due to lack of material
2	57M	DLBCL, NOS, non- GCB	58	Diffuse LAD, anemia, HSPM, BM involvement	R-CHOP	Bone marrow and lymph node: Low-density CD5, CD19, CD20, partial CD24, partial dim CD38 and low density, monotypic kappa light chains.	Tumor tissue culture: 46.XX\$\deta(-12)\deta(12)\gamma\deta(12)\gamma\deta(12)\gamma\deta(12)\gamma\deta(12)\gamma\deta(12)\gamma\deta(12)\gamma\deta(12)\gamma\deta(12)\gamma\deta(12)\gamma\deta(12)\gamma\deta(12)\gamma\deta(12)\gamma\deta(12)\gamma\deta(12)\gamma\deta(12)\gamma\deta(12)\gamma\deta(12)\gamma\deta(12)\deta(12	Tumor tissue culture: 30.5%	Not tested due to lack of material
3	70F	HG BCL, NOS	N/A	HSPM, generalized LAD, anemia, BM involvement	R-CHOP	Bone marrow: small to intermediate size, HLA-DR, partial CD10, CD19, CD20, CD24, CD38 and high- density lambda light chain.	Bone marrow: 46,XX,der(1)(1,(3)(q32,q22),(9;14)(p13,q32),add(15)(p13)x2[14]46,XY[6] Lymph node: 46,XX,der(1)(1,3)(q32,q22),(9;14)(p13,q32),add(15)(p13)x2[13]46,al,add(5)(q35)[5]46,XY[2]	Bone marrow: 55% Lymph node: 85%	Bone marrow: 36.5%
4	6SF	MZL	N/A	Anemia, SPM, BM involvement, findings concerning for possible MDS/MPN with circulating blasts	Bendmustine + Rituximab	Peripheral blood: small to intermediate size, CD45, CD11e, CD23, CD19, HLA-DR, CD20 and both kappa and lambda light chains.	Bone marrow: $\frac{465000}{650000000000000000000000000000000$	Bone marrow: 70.5% (rearrangeme nt of both copies of IGH); 12.5% (rearrangeme nt of one copy of IGH)	FFPE: 68%

PL = pleural effusion; SPM = splenomegaly; HSPM = Hepatosplenomegaly; BM= bone marrow; LAD = Lymphadenopathy.

#24 CAPNON: A Rare Case With Long-Term Follow-up

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Mentor: Douglas Anthony

Program: Pathology Type: Case Report

Background: Calcifying pseudoneoplasms of the neural axis (CAPNONs) are rare, benign lesions that may occur anywhere in the central nervous system. Less than 100 cases are reported in literature, and their etiology and natural history are not well understood. We present a unique case of CAPNON followed over 18 years.

Case: The patient had a biopsy at presentation and was followed with regular MRI. After 18 years, an increase in the lesion size was followed by gross total resection and allowed for definitive diagnosis. Gross, microscopic, and immunohistochemical findings were diagnostic of CAPNON. Microscopic features included extensive calcification within a fibro-osseous and chondromyxoid matrix. Scattered inflammatory cells and vascular proliferation were prominent, and the perimeter of the lesion showed brain tissue with gliosis. Immunohistochemistry demonstrated epithelial membrane antigen (EMA) positivity in arachnoid cells and GFAP expression in adjacent brain tissue.

Conclusion: CAPNONs are rare and have characteristic gross and microscopic findings. The prognosis is excellent following resection, and more investigations along with the reporting of cases may allow additional insight into their unknown etiology.

#25 Immunohistochemical Analysis of the Role of Wnt/β-Catenin Signaling in Pathogenesis of Sclerosing Angiomatoid Nodular Transformation

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Mentor: Dinesh Pradhan **Program:** Pathology **Type:** Original Research

Background: Sclerosing angiomatoid nodular transformation (SANT) is a benign circumscribed lesion of the spleen composed of multiple angiomatoid nodules with intervening fibrosclerotic stroma. Patients are often asymptomatic, with 50-90% of cases detected incidentally by imaging studies. The etiology of SANT is currently unknown. Roles for IgG4-plasma cells and Epstein-Barr virus infection have been previously proposed, but these hypotheses have yet to be supported by current literature. Assessment of clonality has suggested that SANT is a polyclonal, reactive lesion, but recent data has reported CTNNB1 (β-catenin) exon 3 deletions in SANT, suggesting that it is a benign neoplasm. Thus, additional research is required to delineate the nature and pathogenesis of SANT.

Methods: Following IRB approval, a total of 10 patients with SANT were identified by a pathology database review over a period of 34 years, and their clinicopathologic and immunohistochemical information was evaluated. In 3 cases which were available for study, immunohistochemistry (IHC) was performed for β-catenin and lymphoid enhancer-binding factor 1 (LEF1), a downstream mediator of the Wnt/βcatenin signaling pathway.

Results: IHC for β-catenin demonstrated loss in most of the lesion and focal cytoplasmic and perinuclear staining of small-sized vessels and capillaries in all cases (3/3). In contrast, membranous expression of β-catenin was observed in the endothelial cells lining the sinusoids of the normal red pulp (3/3). However, no aberrant expression of LEF1 was detected in any cases (0/3).

Conclusion: These findings confirm a role of the Wnt/β-catenin signaling in the pathogenesis of SANT as a benign neoplasm with aberrant β -catenin expression.

#26 Prolonged Dengue With Warning Signs, Bacteriemia, and Acute Renal Failure in a Renal Transplant Patient

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Mentor: Nicholas Streck

Program: Pathology

Type: Case Report

Background: A 72-year-old male with chronic kidney disease status post renal transplant presented to a Mexican hospital with fever, malaise, weakness, and decreased oral intake. He was found to have pleural effusion, acute renal failure, thrombocytopenia, and coagulopathy. He was diagnosed with dengue with warning signs by non-structural protein 1 antigen and IgM antibody and treated with oxygen, diuresis, and anticoagulation reversal with Vitamin K and fresh frozen plasma. After five days of hospitalization, his symptoms improved; however, his renal function worsened, and he was discharged to follow up in the United States.

Case: He returned to the United States and was admitted for hypotension, tachycardia, and bilateral upper extremity edema. His leukopenia and thrombocytopenia persisted, and he was evaluated for other co-infections that may have prolonged his dengue symptoms. Blood cultures were positive for multidrug resistant extended spectrum beta-lactamase E. coli; all other studies returned negative. Dengue serologies repeated on day twenty after symptom onset were positive for NS1 antigen, IgM, and IgG, suggesting a prolonged critical phase of infection. Immunosuppression was decreased, and he was placed on eight days of ertapenem therapy. He underwent fluid resuscitation and received three units of platelets for continued mucosal bleeding. His leukopenia and thrombocytopenia improved, and his renal function returned to baseline. He was discharged home after nine days of hospitalization.

Conclusion: This case demonstrates the importance of knowledge of uncommon disease processes and management with co-morbid conditions. One week post discharge, his laboratory data normalized, and his anticoagulation restarted.

#27 Clinicopathologic and Molecular Characterization of Primary Gastrointestinal Melanoma

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Mentor: Dinesh Pradhan **Program:** Pathology **Type:** Original Research

Background: Primary gastrointestinal tract melanoma (PGIM) is an extremely rare and aggressive tumor with a poor prognosis. Currently, there is no standard staging system and limited consensus on optimal management. Additional research is imperative to elucidate molecular pathways, find predictive biomarkers, and pinpoint therapeutic targets.

Methods: Following IRB approval, a total of 39 patients were identified over a period of 33 years, and their clinicopathologic, molecular, and survival information was evaluated

Results: In our cohort, tumor distribution was as follows: 5 gastric, 3 esophageal, 1 colonic, 19 anal, 8 rectal, and 3 anorectal. PRAME immunohistochemistry (IHC) was diffusely positive (2/3) and patchy positive (1/3). BRAF V600E IHC was negative (3/3). KIT IHC was focally positive (2/3). Next-generation sequencing (NGS) was performed in 9 (23%) cases, revealing mutations involving KIT (4 cases), NRAS (2 cases), and SF3B1 (1 case). Two cases exhibited CDKN2A loss. Notably, mutations involving BRAF or NF1 were not identified.

Of 29 patients with follow-up, 8 (28%) patients had localized disease, 5 (17.2%) developed regional metastasis, and 16 (55%) developed distant metastases. Seventeen (43.6%) patients died (median survival 7 months), 5 (12.8%) were alive with disease, and 4 (10.3%) were disease-free at last follow-up (median f/u 34.3 months). The overall 5-year survival rate was 28.2%.

Conclusion: In our study, most patients developed metastases and died within 7.5 months of diagnosis. Mutations frequently associated with cutaneous melanoma are not commonly found in PGIM. This study further highlights the aggressive nature of PGIM and the possible need for molecular profiling in guiding clinical management for improved survival of these patients.

#28 IgG4-Positive Plasma Cells in Cutaneous Versus Extra-Cutaneous Rosai-Dorfman Disease

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Mentor: Dinesh Pradhan Program: Pathology Type: Original Research

Background: Rosai-Dorfman disease (RDD) is a rare histiocytic disorder with an excellent prognosis involving nodal and extra-nodal tissues. Although skin and soft tissue is the most common extra-nodal site, cutaneous RDD (CRDD) is extremely rare and shows subtle differences in histological findings from extra-cutaneous RDD. Possible association with IgG4-related sclerosing disease has been reported with many cases showing increased IgG4(+) plasma cells. However, there is little data regarding the number and proportion of IgG4(+) plasma cells in CRDD.

Methods: Following IRB approval, a total of 68 patients of RDD were retrieved over a period of 34 years and their clinicopathologic, immunohistochemical, and survival information were evaluated. Immunohistochemistry (IHC) for IgG4, IgG, and BRAF V600E was performed in 53 cases in which tissue was available for study.

Results: Immunohistochemistry for BRAF V600E was negative (53/53). Cyclin D1 was positive (41/41), and ALK was negative (41/41). CRDD demonstrated no increase in IgG4 (5/5) (0/HPF) or IgG (5/5) in our study. In contrast, extra-CRDD demonstrated a significant increase in IgG4/IgG (10-60%), and IgG4 ranged from 7-35/HPF (30/41). Of 49 patients with known follow-up, only 5 patients (10%) with soft tissue involvement (extra-CRDD) had residual disease or suspected residual disease. No patients died or developed any widespread dissemination.

Conclusion: This study further highlights the heterogeneous nature of RDD, with divergence of expression of IgG4(+) plasma cells in CRDD versus extra-CRDD. Interestingly, all patients in this study with residual disease had extra-CRDD. Thus, there continues to be a need for understanding the pathogenesis of RDD for guiding clinical management.

#29 Artificial Intelligence Characterization of Spatial Patterns of Macula and Their Association With Central Visual Field Progression in Glaucoma

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Mentor: Robert N. Weinreb **Program:** Ophthalmology Type: Original Research

Background: Preserving central retinal ganglion cells is crucial in glaucoma management, as macular damage in the 10-2 visual field (VF) impacts quality of life. The purpose of this study is to characterize spatial patterns of macular ganglion cell complex (GCC) thickness and assess their associations with central VF progression in glaucoma.

Methods: A total of 4219 macula scans of 1116 eyes (613 participants) were included in this retrospective cohort study (NCT00221897, NCT00221923). Macular patterns from GCC were determined by an artificial intelligence (AI) unsupervised algorithm (archetypal analysis (AA)). Diagnostic accuracy of spatial patterns to detect 10-2 central VF progression in 262 eyes (175 patients) with a minimum of five 10-2 VF tests was calculated and compared with mean naive GCC thickness. VF progression was defined based on pointwise linear regression and trend-based methods.

Results: AA identified 11 distinct spatial patterns across different glaucoma stages (Figure 1). The AA model at baseline achieved Area Under the Receiver Operating Characteristic curve (AUROC) of 0.73 (95% CI [0.60 - 0.84]) and outperformed mean GCC thickness (0.55, 95% CI [0.46 - 0.61], P = 0.006) for predicting central VF progression in eyes with early stages of glaucoma. The AA model (AUROC: 0.70 95% CI [0.59 - 0.80]) outperformed mean GCC (0.55 [95% CI 0.48 - 0.60], P = 0.012) thickness for predicting central VF progression across all severities.

Conclusion: AI-driven spatial GCC patterns exhibit distinct characteristics associated with central VF progression in glaucoma. Macular patterns may enhance patient care and risk stratification.

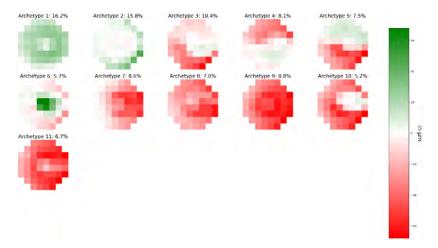


Figure 1. Eleven macula ocular coherence tomography (OCT) patterns for varying glaucoma severity, as determined by unsupervised archetypal analysis. The percentage above each archetype indicates the respective average decomposition weight in our dataset for each pattern.

#30 Association Between Rurality of Residence and Initial Stage at Presentation of Oral Cavity and Oropharyngeal Squamous Cell Carcinoma

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Mentors: Elizabeth Bradford Bell, Tony Richa

Program: Otolaryngology **Type:** Original Research

Background: Barriers to healthcare have been associated with poor outcomes in patients with cancer. This study includes the largest sample size in a United States study aimed at better understanding if the rurality of patients' residences is associated with the stage of oral cavity or oropharyngeal squamous cell carcinoma (SCC) at initial presentation.

Methods: This 2024 hospital-based multicenter retrospective observational review utilized the National Cancer Database (NCDB). The rurality of each patient's residence was binned into Metro, Urban, and Rural. The main outcome of this study was the AJCC 8th Edition clinical stage assigned to the patient at initial presentation. All models were adjusted for the year of initial presentation.

Results: A total sample of 42,258 patients was evaluated, including 43.2% with oral cavity and 56.8% with oropharyngeal SCC diagnoses. Patients with oropharyngeal SCC from urban areas had higher odds of having a Stage 3/4 cancer (AOR = 1.16; 95% CI: 1.05, 1.28) relative to metro patients. Participants from urban areas had an increased risk of death for both the oral cavity SCC group (AHR = 1.11; 95% CI: 1.01, 1.21) and oropharyngeal SCC group (AHR = 1.23; 95% CI: 1.10, 1.37) compared to patients residing in metro areas.

Conclusion: Urban patients were more likely to have a higher stage of oropharyngeal SCC at initial presentation, along with worse survival for either type of SCC, compared to the metro groups. Rural outcomes did not statistically differ from metropolitan outcomes. Future local or regional database analyses would better characterize the more nuanced patterns present in a particular region.

#31 Improving the Usability and Usage of a Tracheostomy Order Set

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Mentor: Jayme R. Dowdall Program: Otolaryngology Type: Original Research

Background: The usability of electronic medical records has been linked to concerns for patient safety and provider wellness. One concern is that an order set's "end user" may be inexperienced with the complexities associated with the tracheostomy patient continuum. The formation and utility of an intuitive workflow in the entire care continuum has not been investigated.

This quality improvement project aimed to (a) Improve order set usability; (b) Create a multidisciplinary process to overhaul a clinical order set at a single institution with stakeholder engagement across service lines; and (c) Address barriers to implementation and dissemination with processes and stakeholder groups.

Methods: The workflow of a self-organized multidisciplinary working group was documented, and end users were identified. An implementation plan was crafted, and use was tracked. Special attention was paid to unintended consequences.

Results: Six multidisciplinary meetings discussed improvements and the impact of change on each stakeholder. Opportunities for efficiency included deferring practice to hospital policy, as seen in **Figure 1**, and removing education from the order set.

Analyses revealed improved efficiency, with 42% fewer clicks and 60% fewer clinical decisions required for the completion of the order set. Use was significantly improved, with 60% more providers using the new order set annually. Barriers to implementation included the lack of hospital policy at some hospitals and turnover of end users in an academic institution.

Conclusion: Assembling a multidisciplinary team to improve the usability of a tracheostomy order set provides an opportunity for seamless implementation of hospital policies across service lines. This may be a generalizable pathway to a standardized care continuum without a dedicated tracheostomy rounding team.

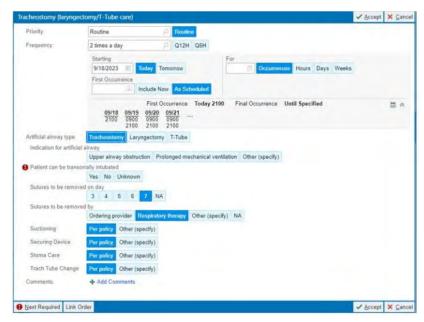


Figure 1. Final tracheostomy order set with "per policy" pre-selected to only require one clinical decision for the "end-user".

#32 A Case of Phrynoderma Initially Managed as Folliculotropic Mycosis Fungoides

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Mentor: Matthew Stephany

Program: Dermatology

Type: Case Report

Background: A 64-year-old female patient presented to the clinic for management of mycosis fungoides (MF). She had a long history of mildly pruritic pink plaques with follicular accentuation on the face, trunk, and extremities with scattered numerous open comedones. In 2018, skin biopsies from the right side of her face and right thigh showed folliculotropic MF with follicular cysts and a positive T-cell gene rearrangement clone from the right side of her face. She had tried numerous treatments, including narrow band ultraviolet-B, bexarotene, and mogamulizumab, with only some improvement with bexarotene.

Case: Due to the appearance of the rash, a vitamin A level was checked and was low at 298. Vitamin A oral supplementation with 10,000 units daily was initiated, and a repeat vitamin A level three months later was even lower at 252. She was started on vitamin A infusions, and the vitamin A level normalized. She was also started on acitretin and has had drastic improvement in the texture of her skin and fewer open comedones. Given the rash has only improved to vitamin A derivatives (bexarotene, acitretin) and not with other agents (mogamulizumab), we favor a diagnosis of phrynoderma.

Conclusion: Phrynoderma appears as hyperkeratotic follicular papules and is most commonly associated with vitamin A deficiency. While more common in developing countries, some patients may develop phrynoderma from poor oral absorption from many possible underlying causes, including inflammatory bowel disease, chronic giardiasis, pancreatic insufficiency, and surgery. This case illustrates the importance of always considering phrynoderma in patients with an extensive follicular cutaneous eruption.

#33 Simulation as a Tool in Medical Knowledge Retention

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Mentor: Kaitlin Dougherty

Program: Emergency Medicine

Type: Original Research

Background: One of the most important foundations to medical learners' curriculum is the application of simulation-based learning. Simulation allows learners to experience stressful scenarios within a controlled environment. This study evaluated the efficacy between standard in-class lecture verses simulation-based learning in emergency medicine resident physicians. Our hypothesis is that simulation learning will result in greater long-term retention compared to in class learning.

Methods: The study included a pre- and post-test as well as alternating investigation groups regrading heavy metal toxicity. Residents received a 30-minute lecture about heavy metal poisoning and then were split into an early intervention and late intervention group. The early intervention group immediately underwent a heavy metal simulation, and the late group underwent identical simulation one month later.

Results: The study demonstrated a statistically significant difference in pre and post quiz scores who received simulation training in the early group (p=0.001). Additionally, there was no significant difference in pre and post quiz scores for residents who did not receive simulation training in the early group.

Conclusion: The most notable limiting factor in this study was a low sample size. The residency program targeted by this study is comprised of a total of 36 residents. As simulation becomes more prevalent in medical schools and residency programs. additional research will be needed to conclude if simulation increases medical knowledge retention.

#34 Plasminogen Supplementation Improves Lysis of Inflammatory Retained Traumatic Hemothorax

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Mentor: Christopher D. Barrett

Program: General Surgery **Type:** Original Research

Background: Traumatic hemothorax is a morbid condition treated with tube thoracostomy and intrapleural tissue plasminogen activator (tPA) and DNAase, but failure rates exceed 20%. Prior studies in empyema have demonstrated failure is due to a lack of plasminogen secondary to inflammatory protease degradation. This study investigates whether retained hemothorax demonstrates similar plasminogen degradation, and if plasminogen supplementation rescues fibrinolysis.

Methods: Hemothorax fluid (N = 16) and plasma (N = 12) from trauma patients were analyzed. Elastase levels and plasminogen activator-inhibitor (PAI)-1 activity were measured. Plasminogen and degradation products were assessed via Western blotting. Fibrinolysis was assessed via turbidity clot lysis assays with and without plasminogen supplementation. Data were analyzed using Wilcoxon signed rank test (p < 0.05).

Results: Elastase and PAI-1 activity were significantly higher in hemothorax relative to corresponding plasma, consistent with an inflamed environment (p < 0.05). After tPA challenge, there was no detectable PAI-1 activity relative to pre-tPA hemothorax samples (p < 0.05). Western blots showed reduced full-length plasminogen in hemothorax samples relative to plasma, with multiple bands consistent with plasminogen fragments. Turbidity assays of hemothorax fluid without plasminogen took significantly longer to achieve 50% clot lysis than those containing supplementation plasminogen when treated with tPA (248.1 minutes, IQR 91-270 versus 166 minutes, IQR 113.3-198.3, p < 0.05) (**Figure 1**).

Conclusion: Hemothorax is an inflamed environment with a blunted fibrinolytic response due to plasminogen degradation that can be rescued with supplemental plasminogen. Furthermore, there is insufficient PAI-1 activity to explain fibrinolytic resistance. These findings parallel previous results in infected pleural fluid and question the efficacy of current intrapleural fibrinolytic therapy for hemothorax.

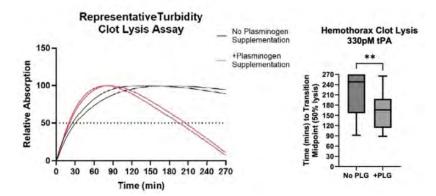


Figure 1. Turbidity clot lysis assays of hemothorax sample.

#35 Surgical Denervation of the First Carpometacarpal Joint for Osteoarthritis: A Systematic Review

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Mentor: Kai Yang

Program: General Surgery

Type: Review

Background: First carpometacarpal joint osteoarthritis (CMCJ-OA) is a progressive condition that impacts quality of life. Treatments focus on pain relief and improved function. When non-operative measures fail, surgery with trapeziectomy with/without ligament reconstruction offers durable results. Recent literature describes joint denervation as a minimally-invasive alternative that decreases pain and expedites recovery in first CMCJ-OA. We provide a comprehensive review of the current literature to assess the long-term efficacy and role of denervation first CMCJ-OA treatment

Methods: A literature review identified studies with adults undergoing first CMCJ denervation for osteoarthritis. The Preferred Reporting Items for Systematic Reviews and Meta-Analyses guidelines were followed. Reviewers performed screening, data collection/analysis (demographics, technique, and post-operative outcomes/complications), and quality assessment with the Newcastle-Ottawa Scale and National Institutes of Health Quality Assessment Tools.

Results: Fifteen studies met inclusion criteria for a total of 360 patients/372 hands. The mean follow-up was 35.5 months (range 6-125.6 months). First CMCJ denervation demonstrated reduced pain and improved hand function. Overall pain score reduction was 75.3% (PRE: 7.13; POST: 1.77, p<0.001). Complications across studies were 18.5% with post-operative paresthesia as the most common (12.8%). Wound-related complications/infections were 3%. The conversion rate of 16.3% to trapeziectomy with ligament reconstruction was reported in seven studies with 36.9 month follow-up (range 12-63.5 months).

Conclusion: Surgical denervation is a promising, alternative treatment for patients with first CMCJ-OA. Long-term studies demonstrate success in decreasing overall pain, post-operative complications, and conversion arthroplasty rates. In this study, denervation proves to be an effective, lasting treatment for first CMCJ-OA.

#36 Targeted Muscle Reinnervation of the Superficial Branch of the Radial Nerve Following Coronary Artery Bypass Grafting: A Good Save and Little Victory

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Mentor: James R. Willcockson **Program:** General Surgery

Type: Case Report

Background: Targeted muscle reinnervation (TMR) has revolutionized pain management. Originally described as a nerve transfer technique to control myoelectric prostheses. TMR creates new neurosensory pathways to treat neuroma/phantom pain following limb loss. We present the story of a good save and little victory in a patient successfully treated with TMR for persistent, debilitating paresthesias from the superficial branch of the radial nerve (SBRN) following radial artery harvest for coronary artery bypass grafting (CABG).

Case: Our patient had a history of hypertension, hyperlipidemia, tobacco use, and poorly-controlled diabetes (A1c 12.9%), who presented with chest pain. Workup was consistent with non-ST-elevation myocardial infarction. Left heart catheterization revealed severe multivessel coronary artery disease for which CABG was indicated. Following surgery, lifestyle modifications were initially successful. However, the psychological burden of ongoing pain from a near-complete SBRN transection from radial artery harvest impacted quality of life. This led to a relapse into smoking and alcohol use, behaviors that previously contributed to the cardiovascular disease. SBRN TMR to extensor carpi radialis brevis motor nerve was completed. Subsequent follow-ups have demonstrated cessation of analgesic use, improved pain, and restored ability to work, care for his children, and effectively engage in activities of daily living.

Conclusion: Applications of TMR have been well-described as treating chronic pain in amputees and preventing neuroma formation following major limb loss. As highlighted here, TMR provides a spectrum of benefits to amputees experiencing residual limb pain, and little victories to those suffering from chronic pain sustained in trauma or surgery.

#37 Indocyanine Green and Near-infrared Guided Surgery Publications: An Analysis of Conflict of Interest Statements and Industry General **Payments**

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Mentor: Juan A. Santamaria-Barria

Program: General Surgery

Type: Original Research

Background: The use of indocyanine green and near-infrared (ICG-NIR) guidance in surgery is expanding. Medical device companies provide general (non-research) payments to promote their technology, potentially influencing conflicts of interest (COI) and publication bias.

Methods: We reviewed ICG-NIR articles in the top 100 highest impact surgery journals between 2018 and 2023 with at least one U.S.-affiliated author. Authors were cross-referenced with the U.S. Centers for Medicare & Medicaid Services Open Payments Database for industry general payments related to ICG-NIR products. The amount, product, company, and nature of payments, and COI reporting concordance were analyzed.

Results: Of 240 ICG-NIR articles, 46.7% (112/240) had discordant COI reporting. Among the 158 articles explicitly stating no COIs, 43% (68/158) had underreported payments, while 53% (44/82) of those disclosing COIs still underreported payments (Figure 1). Plastic surgery articles had a higher concordant COI reporting rate (77.5%, 62/80, p < 0.05) compared to other surgical specialties (41.3%, p < 0.05)66/160, p < 0.05). Industry payments totaled \$8,089,060, with 31.7% (\$2,567,825) linked to authors underreporting COIs. The top paying companies were Intuitive (\$3,820,538), Stryker (\$3,162,591), and NOVADAQ (\$783,593; later acquired by Stryker). SPY/PINPOINT (Stryker/NOVADAQ) and Da Vinci (Intuitive) were the top ICG-NIR products, making up 96% of all payments (\$7,766,722). The top underreported payment categories were consulting fees (38.3%), education (21.3%), travel & lodging (16.5%), and speaker/faculty compensation (8.5%) (Figure 1).

Conclusion: Between 2018 and 2023, authors of ICG-NIR publications underreported industry-related COIs and general payments. While industry-surgeon collaborations are essential for the advancement of surgery, standardized COI disclosures and transparent company funding are urgently needed.

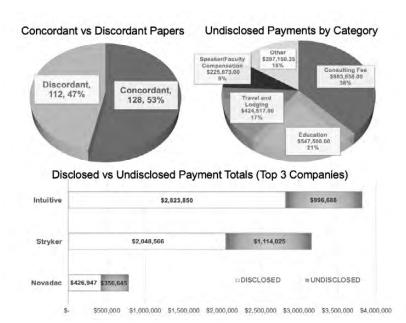


Figure 1. Discrepancies in conflict of interest disclosures and industry payments in indocyanine green and near-Infrared surgical publications.

#38 Muscle Oxygen Levels in Patients With Claudication: Measurements During Rest, Walking, and Temporary Occlusion of Blood Flow

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Mentor: Iraklis I. Pipinos Program: General Surgery Type: Original Research

Background: Walking is the most significantly impacted activity for patients with peripheral artery disease (PAD), with claudication being the most common symptom. Supervised treadmill (TM) exercise is the primary recommended treatment for patients with claudication. Therefore, it is crucial to understand the ischemic stress that leg muscles experience during walking in these patients.

Methods: This study was approved by the Institutional Review Board of VA Nebraska-Western Iowa Health Care System, and all participants provided informed consent. Eighteen male claudicating PAD patients (mean age 70, Ankle-Brachial Index 0.72) underwent both TM and post-occlusive reactive hyperemia (PORH) tests, involving a 5-minute thigh cuff occlusion. Near-infrared spectroscopy (NIRS) devices measured gastrocnemius muscle oxygenation (StO2) in the most symptomatic leg. Data were processed in MATLAB to assess StO2 dynamics.

Results: Representative NIRS outputs from PORH and TM are shown in **Figure 1**. The overall drop in StO2 during stress was similar between the two tests (p = 0.21); but oxygenation declined faster in TM (time to minimum StO2: TM 92s vs PORH 267s; slope: TM -1.4 vs PORH -0.3%/s, p < 0.001). During recovery, StO2 recovered more slowly after the TM (slope, PORH 1.5 vs TM 0.5%/s, p < 0.001), while reaching a higher maximum StO2 (PORH vs TM 113 vs 136%, p = 0.001) and exhibiting a greater hyperemic response (PORH 1713 vs TM 18359%*s, p < 0.001).

Conclusion: In claudicating patients, walking produces profound drops in calf muscle oxygenation that are faster and larger oxygen deficits than those produced by acute occlusion of arterial inflow of similar duration, and with slower recovery. These findings shed light in the rapid and profound oxygenation deficits produced by walking in claudicating patients, underscoring the need for improved revascularization and tailored exercise strategies.

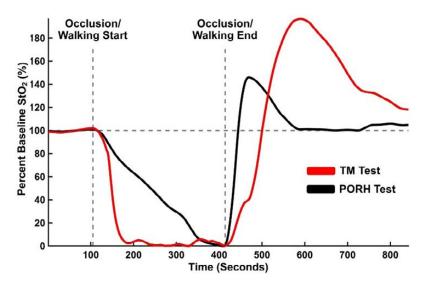


Figure 1. Representative NIRS output from the same participant for both TM (red) and PORH (black) tests.

#39 Subclassification of Peripheral Artery Disease Based on Muscle Force: Leg Failure With Reduced Muscle Force and With Preserved Muscle Force

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Mentor: Iraklis I. Pipinos Program: General Surgery

Type: Original research

Background: Claudicating patients with peripheral artery disease (PAD) experience leg failure, as evidenced by distinct walking impairment. However, some maintain preserved leg muscle strength, while others demonstrate reduced strength. This study compares the clinical and physiological characteristics of these groups.

Methods: This study was approved by the Institutional Review Board of VA Nebraska-Western Iowa Health Care System, and all participants provided informed consent. Fifty-four claudicating patients were categorized into two groups: leg failure with preserved muscle force (LEF-PF, N = 19, PT 92 \pm 15 Nm) and leg failure with reduced muscle force (LEF-RF, N=35, PT 49 \pm 13 Nm), based on maximum isometric plantar flexion peak torque measured on a Biodex system. All patients underwent clinical evaluation, leg hemodynamic assessment, walking tests, quality of life surveys, and gastrocnemius biopsy for histological and biochemical analysis. Statistical comparisons were made using independent sample T-tests and chi-square tests.

Results: LEF-PF and LEF-RF had similar demographics and comorbidities. Although ankle-brachial indices were comparable, LEF-RF showed a greater drop in ankle pressure (p = 0.021) and slower recovery (p = 0.023) during reactive hyperemia. Both groups performed similarly on the Gardner Treadmill test, but LEF-PF tended to outperform on the 6-Minute Walk (p = 0.062). Histologically, LEF-PF had larger gastrocnemius myofibers, while biochemically, LEF-RF exhibited greater complex-II-dependent mitochondrial respiratory activity.

Conclusion: This study highlights differences in muscle strength among claudicating patients, despite similar demographics and baseline hemodynamics. Stress-induced hemodynamics, walking performance, muscle histology, and mitochondrial function distinguish these groups. Such insights may enhance our understanding of PAD physiology and potentially correlate with variations in mortality rates, progression to more advanced PAD stages, and responses to different therapeutic interventions.

#40 Unmasking Constrictive Pericarditis Through Multimodality Imaging: A Rare Case

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Mentor: Adam Burdorf

Program: Internal Medicine – Cardiology

Type: Case Report

Background: Constrictive pericarditis (CP) is an extremely rare cause of heart failure (HF) needing a high level of clinical suspicion. We discuss a unique case of CP discovered in the light of multimodality imaging.

Case: A 76-year-old female with a history of monoclonal gammopathy of undetermined significance, heart failure with preserved ejection fraction, atrial fibrillation, COPD, DM type II, and squamous cell carcinoma was admitted to the hospital for worsening shortness of breath, swelling in legs, hyponatremia, and UTI/pyelonephritis. HF team was consulted for her decompensated HF. She had no prior history of irradiation. CT chest showed diffuse pericardial calcifications (Figure 1A-B). Subsequent right heart catheterization showed elevated right and left sided filling pressures with diastolic equalization and positive right ventricle square root sign and ventricular interdependence; these findings were consistent with CP (Figure 1C). Cardiac MRI (Figure 1D) was obtained, which revealed diastolic septal flattening with deep inspiration and septal bounce suggestive of interventricular dependence and constrictive physiology. Cardiothoracic surgery team was consulted for the possibility of pericardiectomy. Following a thorough discussion of risks and benefits, it was concluded that the patient was not a good candidate for this high-risk surgical procedure due to her advanced age, frailty, and comorbidities. Consequently, the patient opted for medical management.

Conclusion: This case underscores the importance of maintaining a high index of suspicion for CP, given its rarity and non-specific clinical features. The utility of multimodality imaging in the diagnostic process is highlighted in guiding patient management decisions.

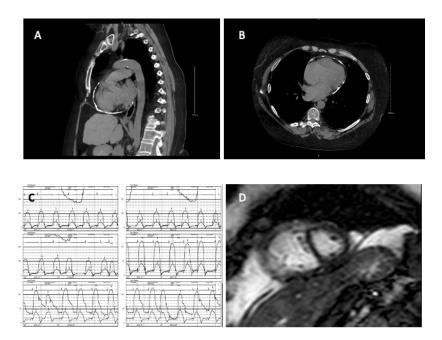


Figure 1. (A & B) CT Chest showing pericardial calcifications, (C) RHC and (D) MRI showing ventricular interdependence.

#41 Unwanted Travel Souvenirs; Parasite Causing Fever in a Returning **Traveler**

Cristina Torres¹, Daniel Brailita¹ Chunyi Zhou², Nosakhare Edogun³, Jana Broadhurst², David Brett-Major^{1,4}, Angela Hewlett¹, Mackenzie R. Keintz¹, Bryan Alexander⁵. Jennifer M. Davis¹

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Mentor: Jennifer M. Davis

Program: Internal Medicine – Infectious Diseases

Type: Case Report

Background: Fever in returning international travelers should prompt consideration for endemic and emerging infectious diseases. Early symptoms of malaria are often nonspecific. If diagnosis and therapy are delayed, patients can experience high parasite burden leading to severe disease.

Case: A 61-year-old man with no chronic medical conditions presented to the emergency department with 2 days of fever, myalgias, and night sweats after returning from a 2-week trip to Uganda. The patient had gone on safari, went white water rafting, and staved in hostels. He did not receive any travel-focused vaccines or antimalarial chemoprophylaxis. Laboratory abnormalities included platelet count 35 U/L, white blood count 6.4 U/L with 0% eosinophils, AST 100 U/L, ALT 114 U/L, alkaline phosphatase 139 U/L, total bilirubin 4.1 mg/dL. Peripheral blood smear (**Figure 1**) and BioFire® Global Fever Panel were positive for *P. falciparum*, with initial parasite burden >5%. Given the severity of disease, he was started on IV artesunate. Acquisition of IV artesunate was delayed requiring use of oral therapy. He completed 1.5 doses of IV artesunate and 5 days of artemether-lumefantrine. On follow up, night sweats and urinary frequency prompted testing and subsequent treatment of Schistosoma coinfection.

Conclusion: Travelers can be exposed to multiple infectious threats in tropical areas, and patients should be evaluated for co-infections. Pre-travel counseling should include offering antimalarial chemoprophylaxis to patients traveling to areas of risk. If IV artesunate is not available for management of severe malaria, treatment with oral antimalarials should be initiated until IV therapy can be obtained.

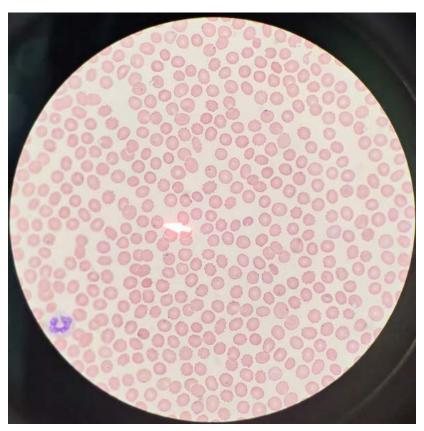


Figure 1. Peripheral blood smear with intracellular ring trophozoites of *P. falciparum*.

#42 Unmasking a False Electrolyte Imbalance With High Prevalence Among AML Patients: A Case of Pseudo Hyperkalemia and Hypokalemia in an AML Patient

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Mentor: Kathleen Borghoff

Program: Internal Medicine – Nephrology

Type: Case Report

Background: Pseudo-hyperkalemia and pseudo-hypokalemia are lab phenomena that can significantly impact the management of patients, especially with acute leukemias like Acute Myelogenous Leukemia. The incidence is 25-50% in AML patients, which underscores the importance of these phenomena.

Case: A 63-year-old man diagnosed with AML two months ago presented with worsening fatigue and shortness of breath after alternative therapies did not improve his condition. He was admitted for chemotherapy. On admission, his lab findings were WBC 330.1 x 103/mm3; HGB 5.8 g/dl; Initial basic metabolic profile (BMP) had potassium (K) at 6.6 mmol/L, creatinine at 4.13 (baseline of 1.31 g/dL). No ECG changes were seen.

After receiving 1.2 L bolus of normal saline, the repeat BMP had serum K - 2.9 mmol/L without hyperkalemia treatment. After a few hours, K became normal at 4.8 mmol/L. He had no further significant K abnormalities during his stay. Later, he developed persistent neutropenic fevers with Methicillin Sensitive Staphylococci Infection. He also had severe mucositis and bleeding. He was transferred to the Critical Care unit where he transitioned to comfort measures after family discussion.

Conclusion: This case report underscores the importance of having a low threshold of suspicion for pseudo electrolyte imbalance as part of the presentation in AML patients. Treating either the initially elevated K, which was due to the release of K in the blood sample or the subsequent hypokalemia due to greater uptake of K into the leukemic cells could have had a deleterious effect on our patient. This case highlights the need for careful laboratory interpretation and clinical monitoring especially in leukemia patients.

#43 Quality Improvement Initiatives to Decrease Hypoglycemia in **Hospitalized Patients**

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Mentors: Mitchell Nohner, Andjela Drincic **Program:** Internal Medicine & Pediatrics

Type: Original Research

Background: Hypoglycemia in hospitalized patients is a persistent adverse event. Three quality improvement interventions were implemented with the aim of reducing hypoglycemia. Each intervention was targeted at one component of the typical inpatient insulin management – basal, prandial, and correction – to try and achieve this singular quality improvement aim.

Methods: The incidence of hypoglycemia in non-obstetrics patients >18 years of age at a tertiary hospital receiving scheduled insulin before and after the implementation of quality improvement initiatives was compared. Incidence was defined as the number of unique patients with a hypoglycemic event in a given month, divided by all admissions for that month. The interventions included integrating weight-based insulin guidance into the electronic medical record, the addition of a carbohydrate-limited diet, and increasing the threshold for correction insulin administration from 150 mg/dL to 180 mg/dL.

Results: After the implementation of the interventions, there was a significantly lower incidence of hypoglycemia associated with prandial insulin (p = 0.02) and correction insulin (p < 0.001). There was not a significant decrease in hypoglycemia associated with basal insulin in the general population (p = 0.25). There was a significant decrease in a subgroup analysis focused on hospital-associated hyperglycemia and Type 2 diabetes (via exclusion of patients with Type 1 or cystic fibrosis-related diabetes) (p = 0.005).

Conclusion: Quality improvement initiatives implemented were significantly associated with a reduction in hypoglycemia in hospitalized patients.

#44 Outcomes of Acute Myocardial Infarction in Patients With vs. Without Systemic Lupus Érythematosus

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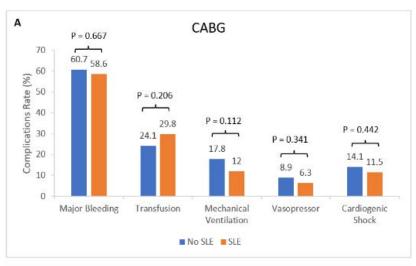
Mentor: Ahmed S. Aboeata **Program:** Internal Medicine **Type:** Original Research

Background: Patients with systemic lupus erythematosus (SLE) have an elevated risk of cardiovascular disease. Outcomes of acute myocardial infarction (AMI) and revascularization with percutaneous coronary intervention (PCI) or coronary artery bypass surgery (CABG) in patients with SLE have not been well described.

Methods: We used the National Inpatient Sample (2016-2021) to identify patients ≥18 years old hospitalized for AMI (ST-elevation myocardial infarction [STEMI] or non-STEMI [NSTEMI]) and stratified them by the presence of SLE. The primary outcome was in-hospital mortality. Secondary outcomes included revascularization strategy (PCI vs. CABG), complications, hospital length of stay (LOS), and total costs. Propensity-score matching (PSM) was used to minimize selection bias. This project was deemed "not human subjects research" by the Institutional Review Board.

Results: Of 788,163 hospitalizations for AMI (207,291 STEMI, 577,514 NSTEMI), 3358 included patients with SLE. After PSM, in-hospital mortality (10.3% vs. 7.7%, p = 0.10) and revascularization strategy were similar among STEMI patients with vs. without SLE. Among patients with NSTEMI, in-hospital mortality (3.3% vs. 3.8%, p = 0.33) was similar between SLE and non-SLE patients, but PCI rates were higher (22.6% vs. 19.5%, p = 0.007) and CABG rates were lower (6.9% vs. 10.5%, p < 0.001) in patients with SLE. Similar mortality, complication rates and were seen between the two groups with both PCI and CABG (Figure 1).

Conclusion: SLE patients hospitalized with AMI have similar in-hospital mortality, resource utilization, and complication rates compared to those without SLE. AMI care should not be withheld from patients with SLE.



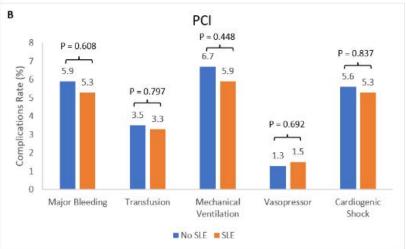


Figure 1. Similar complication rates (bleeding, transfusion, vascular injury, cardiogenic shock) are associated between SLE and non-SLE patients with both CABG (**A**) and PCI (**B**).

#45 A Rare Case of a Thyrotropin Secreting Pituitary Adenoma

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Mentors: Avin Pothuloori, Marium Ilahi, David Odegaard

Program: Internal Medicine – Endocrinology

Type: Case Report

Background: Thyrotropin secreting pituitary adenomas are the rarest pituitary adenomas, representing 0.5% of functioning pituitary adenomas with a prevalence of 2 cases per million. These tumors secrete active TSH that is non-responsive to thyrotropin-releasing hormone. They are responsible for less than 1% of all hyperthyroidism cases.

Case: A 47-year-old male with a medical history of cardiomyopathy and atrial fibrillation requiring multiple cardioversions and ablations presented with palpitations and was found to be in atrial fibrillation with rapid ventricular response. Lab workup revealed elevated Free T4, Total T3 and Free T3 with a normal TSH. He was treated for hyperthyroidism and discharged on methimazole and propranolol. He was readmitted for atrial fibrillation with rapid ventricular rate, labs on admission were consistent with central hyperthyroidism; TSH, free T4, total T3 and TSH alpha-SU were elevated, Sex hormone binding globulin was in upper normal range, thyroid antibodies were negative, and insulin like growth factor 1 was elevated. The growth hormone suppression test was negative. The thyroid ultrasound was normal and pituitary MRI w/wo contrast confirmed a 1.6 x 6.0 x 8.0 mm microadenoma within the left side of the pituitary gland. Methimazole was discontinued and beta-blockade was continued. He was seen by neurosurgery. He is currently on surveillance and medical management with octreotide and beta blockers as the patient would like to avoid surgical intervention.

Conclusion: This case highlights the importance of considering Thyrotropin secreting pituitary adenomas rare in patients with cardiovascular disease and hyperthyroidism.

#46 A Rare Case Presentation of Congenital Anomaly of the Kidney in a Patient With Maturity Onset Diabetes of the Young Type 5

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Mentor: Avin Pothuloori

Program: Internal Medicine – Endocrinology

Type: Case Report

Background: The rarity of Maturity Onset Diabetes of the Young type 5 along with its variable penetrance and the poor specificity of some of the clinical findings can make diagnosis challenging.

Case: A 30-year-old male with Graves 'Disease, Diabetes Mellitus, chronic kidney disease was seen for hyperthyroidism. Patients were asymptomatic with normal physical exam, Hemoglobin A1c was 5.8%, Potassium 3.6 mEq/L, Magnesium 1.6 mg/dL, TSH 0.008 UIU/mL, free T3 4.6 pg/mL free T4 1.65 ng/dL and normal Uric acid. He was treated with methimazole but developed elevated creatinine, AST and ALT. Magnetic resonance cholangiopancreatography showed mild hepatic steatosis, a dysplastic atrophic left kidney and bilateral simple renal cysts, liver biopsy was normal. Genetic testing confirmed hepatocyte nuclear factor 1 homeobox B mutation. Patients were treated with methimazole metformin. Maturity Onset Diabetes of the Young Management depends on the type of the condition and whether oral hypoglycemic agents or insulin is best. In patients with this condition, insulin is the recommended treatment.

Conclusion: There have not been established guidelines for implementation of sodium-glucose cotransporter-2 inhibitors, Glucagon-like peptide-1 agonists, Metformin in patients with normal body mass index in treatment of this condition. This patient with Maturity Onset Diabetes of the Young type 5 had been treated with metformin alone with good diabetic control, suggesting that these medications should be further explored as a treatment option. There is no known association of Maturity Onset Diabetes of the Young type 5 with Graves 'Disease. Genetics tests are important in this case.

#47 MicroRNA as Biomarker for Neuroprognostication Following **Cardiac Arrest: A Systematic Review**

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Mentor: Subin Mathew

Program: Neurological Sciences

Type: Review

Background: Accurate prognosis of neurologic outcome after cardiac arrest is currently hampered by the lack of robust prognostic predictors. Ideal biomarkers promise an immediate relationship with the prognosis-determining injury, as well as objective and reliable measurements by means of standardized assay procedures. Unfortunately, no such ideal biomarker of neurologic damage after cardiac arrest has been clearly established. MicroRNAs are attractive novel biomarker candidates due to their immediate relationship with cell metabolism, high stability, and presence in multiple body fluids.

Methods: We performed a literature search of multiple databases using keywords pertaining to microRNA, cardiac arrest, and prognostication, using two independent reviewers. Results were screened and selected based on predefined inclusion criteria and compiled in a data sheet.

Results: We identified 12 studies at the time of our search with detailed reporting on 28 different microRNAs, miR-124 and miR-122 were studied most often, while miR-21, miR-9, miR-574, and miR-483 were studied more than once. Not all studies were methodically similar. In addition, results were not always reported in a uniform way between studies. The prognostic potential of specific miRs was reported in odds ratio, AUC, and mean differences between groups.

Conclusion: Although evidence for the use of specific miR biomarkers in cardiac arrest is growing, the evidence is, at this point, mostly restricted to a few candidates and weakened by the heterogenous reporting of results. MiR-124 is currently the best studied candidate, however, it has not consistently been proven the best available marker. Multiple other candidates are potentially understudied, and more work is needed to allow better comparison between candidates.

Graduate Medical Education Research Symposium

Poster Presentations: Original Research, Review & Case Reports

#48 Correlation of Serial Lung Ultrasound Scores and Sonographic Measurements of Diaphragmatic Excursion With Extubation Success in Intubated NICU Patients Receiving a Dexamethasone Taper

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Mentor: Abhineet Sharma

Program: Pediatrics – Neonatal-Perinatal Medicine

Type: Original Research

Background: Semiquantitative lung ultrasound scores (LUS) can help predict the development of bronchopulmonary dysplasia (BPD). Sonographic measurement of diaphragmatic excursion (DE) may predict the success of preterm neonates extubating from conventional invasive mechanical ventilation (IMV) (Figure 1). Although steroids are often given to preterm neonates to facilitate extubation in the prevention of BPD, the success of individual steroid courses is difficult to predict. We hypothesize that the combined sonographic measurements of LUS and DE may serve as a novel tool to predict an intubated preterm neonate's clinical response to a steroid taper.

Methods: Eligible subjects include infants with birth gestational age < 29 weeks receiving IMV and starting on a dexamethasone taper per the 2006 DART (Dexamethasone a Randomized Trial) protocol. Serial LUS and DE ultrasounds will be obtained during the taper. To quantify ventilatory support, a Respiratory Severity Score (RSS) [RSS = MAP \times FiO2] will be calculated on the days that ultrasounds are performed. Primary outcome will be liberation from IMV at 72 hours postextubation. Secondary outcome will be a reduction in RSS.

Results: Ten subjects have been enrolled. Of the 5 subjects who successfully extubated, the average LUS was 13.9, average RSS 4.00, and average DE 0.63. Of the 5 subjects who did not extubate, the average LUS was 14.7, average RSS 3.63, and average DE 0.94.

Conclusion: While preliminary results suggest that lower LUS and DE values are associated with extubation success during a steroid taper, our sample size remains inadequately powered to suggest statistical significance. Further enrollment must be completed before analyzing results for potential confounding factors.

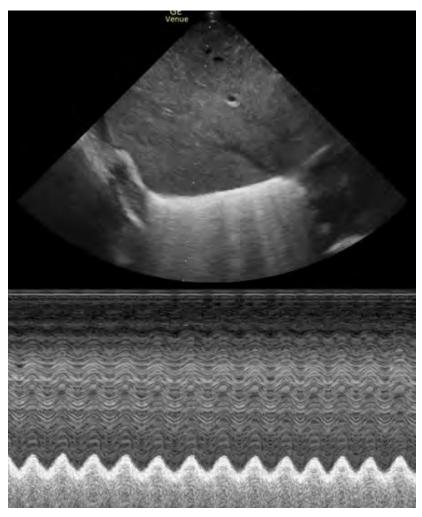


Figure 1. Diaphragmatic excursion measured using M-mode ultrasonography.

#49 The Advanced Practice Provider's Role in Fellow Medical **Education and Training: A Mixed Methods Survey Study to Evaluate Current Educational Interactions, Perspectives, and Models**

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Mentor: Nathan Gollehon

Program: Pediatrics – Neonatology

Type: Original Research

Background: Due to an ongoing paucity of doctors, physician preceptor shortages exist. Advanced practice providers (APPs) are members of the multidisciplinary team working to bridge physician care gaps and assist with the provider's role in medicine. The APP role in medical learning has not been defined or formally evaluated. As APP numbers grow, there is a need to understand the APP and physician-learner interaction and define the APP role in physician education, if one exists. The Liaison Committee for Medical Education and the Accreditation Council for Graduate Medical Education do not provide guidance on the APP/trainee interaction or instruction to APPs teaching learners. Clarity for learners and educators is lacking regarding who is teaching, supervising, and evaluating trainees.

Methods: This is a survey study with a mixed-methods research design. We developed incentivized pediatric fellow and fellowship program director surveys to distribute on the Association of Pediatric Program Directors email listsery. Questions focus on the current fellow/APP interaction and fellow/PD opinions on the APP role in fellowship education. Each survey tool was vetted by pilots who provided informal and structured feedback via cognitive interviews analyzing every survey question. Each survey was evaluated by a qualitative statistician to optimize data collection. Surveys are awaiting dispersal. With results, we will perform a mixed methods analysis utilizing a thematic approach for qualitative data integrated with a quantitative statistical review. Study is IRB-exempt.

Results: Pending. The project completion timeline is enclosed in **Table 1**.

Conclusion: Pending.

Table 1. Project timeline table.

Completed	Literature Review and Annotated Bibliography: Complete (knowledge gap in current literature identified)					
	Written Study Proposal: Complete (including study aims, hypotheses, & research methodology)					
	IRB Exemption Documentation: Complete					
	Survey Tool Development: Complete					
	Budget Development: Grant Support Obtained for Survey Incentive: Complete (\$2500)					
	Survey Tools submitted to APPD for evaluation of dispersal on listserv: Complete					
Nov 2024 – Spring 2025	Data Collection: APPD Approved, survey dispersal and incentive dispersal pending					
Spring 2025	Quantitative and Qualitative Data Analysis: per plan developed with statistician					
Summer 2025	Manuscript Writing					

#50 When Milk is Not Taken Out to Pasteur: A Case Study on Brucella in an Otherwise Healthy Child

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Mentor: Andrea Green Hines

Program: Pediatrics Type: Case Report

Background: Brucellosis is a zoonotic disease that highlights several diagnostic challenges. Brucella is a slow-growing, gram-negative coccobacilli found in wild and domestic animals. Typically, history entails contact with fluids, tissue, or fetuses of infected animals; thus, the associated risk of consuming unpasteurized dairy products or caring for domestic animals. Diagnosis of an infection can be arduous with vague symptoms, such as fever, fatigue, myalgia or arthralgia, abdominal pain, and anorexia.

Case: A 5-year-old male presented to a pediatric emergency department with a 5-day history of fever, fatigue, and cough; diagnosed as a viral illness and discharged with supportive cares. His family brought him back to the Emergency Department on day #9 of illness for persistent fever, fatigue, and new abdominal pain and right ankle arthralgia. A repeat examination was significant for tachycardia and hepatosplenomegaly. Further workup was pursued, and his blood culture became positive for Brucella melitensis. The patient was hospitalized and initiated on trimethoprimsulfamethoxazole and rifampin. Abdominal and cardiac imaging did not demonstrate metastatic complications of the infection. His mother reported travel to Mexico within 4 months prior to admission, where the patient consumed dairy products, though none known to be unpasteurized and no known direct exposure to livestock. He improved clinically, and he completed a 7-week course of dual antibiotic therapy.

Conclusion: The case emphasizes the importance of thorough history taking, clinical vigilance, and follow-up care to identify rare conditions like brucellosis. Early recognition and appropriate treatment prevented severe complications, reinforcing the need for provider diligence and effective family communication.

#51 From Paralysis to Heart Block: A Diagnostic Challenge in Andersen-Tawil Syndrome

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Mentor: Jeffrey Robinson

Program: Pediatrics – Cardiology

Type: Case Report

Background: Andersen-Tawil Syndrome (ATS) is a rare genetic disorder caused by mutations in the KCNJ2 gene, which encodes Kir2.1 potassium channels, resulting in the triad of cardiac arrhythmias, craniofacial dysmorphisms, and periodic paralysis.

Case: A 13-year-old previously healthy male presented with acute lower extremity weakness after participating in strength training. Returning home, he collapsed and was unable to stand, prompting evaluation. Further history detailed a recent camping trip with possible tick exposure. Examination showed retrognathia, hypertelorism, and 3/5 knee extension strength. Diagnostics revealed persistent hypokalemia, elevated creatinine kinase, and negative inflammatory markers. Electrocardiogram demonstrated a second-degree Mobitz Type I atrioventricular block. Given the constellation of findings, a broad differential including cardiogenic, infectious, genetic, rheumatologic, and neuromuscular causes were considered. Further evaluation yielded a normal echocardiogram, infectious, and rheumatologic results. During hospitalization, he subsequently developed ventricular ectopy and escape ventricular tachycardia, and was managed with isoproterenol to promote conduction through the AV node. Potassium supplementation corrected his hypokalemia with concurrent improvement in his weakness. As he progressed, his isoproterenol was discontinued with only intermittent second-degree heart block. Genetic testing was pursued, which revealed a variant of uncertain significance in KCNJ2 (c.659 G>A; p.Ser220Asn).

Conclusion: This is the first report of the Ser220Asn missense variant in KCNJ2 in someone satisfying clinical diagnostic criteria for ATS; however, a variant in the same codon has been previously published with cardiac features alone. This case highlights the importance of maintaining a broad differential and comprehensive approach in pediatric patients who present with an atypical presentation of heart block.

#52 Granulomatosis With Polyangiitis: An Unusual Diagnosis in an **Unusual Patient**

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Mentor: Daniel Reiff **Program:** Pediatrics

Type: Case Report

Background: Granulomatosis with Polyangiitis (GPA), formerly known as Wegener's Granulomatosis, is a rare, systemic autoimmune vasculitis that primarily affects small- to medium-sized blood vessels. It typically involves the upper and lower respiratory tract, kidneys, and sometimes other organs. The disease is characterized by necrotizing granulomatous inflammation and small vessel vasculitis. leading to tissue damage and dysfunction. Due to its nonspecific symptoms, which can overlap with other diseases, GPA poses a diagnostic challenge, particularly in its early stages.

Case: A 13-year-old female presents with foot swelling, a purpuric rash (Figure 1), dark colored urine, sore throat and tonsillar swelling, and migratory arthralgia. Initial lab workup was significant for hematuria with normal kidney function, as well as mild normocytic anemia. She was diagnosed with Henoch Schonlein Purpura and subsequently discharged home with supportive care and routine follow up with her pediatrician. However, the day after discharge, her serum PR3-ANCA levels returned markedly elevated, drastically changing the diagnosis to Granulomatosis with Polyangiitis. She has since been initiated on immunosuppressive therapy and is currently being followed by rheumatology, nephrology, ENT, and pulmonology.

Conclusion: This case report highlights the importance of considering a vasculitis in a patient with suggestive symptoms, even when the patient falls outside of the typical demographic. This report also explores the diagnostic approach, treatment strategies, and potential outcomes when GPA is diagnosed at a younger age. Early recognition of Granulomatosis with Polyangiitis is essential, as prompt initiation of immunosuppressive therapy can significantly improve outcomes and prevent irreversible organ damage.



Figure 1. Dependent purpuric rash and swelling of lower extremities can be a presenting symptom of a variety of diseases, including GPA.

#53 Challenges in Post-Operative Peritoneal Dialysis Management for Neonates: A Case Report of an Infant With Cardiac Surgery and AKI

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Mentors: Melissa Muff-Luett, Veronica Taylor

Program: Pediatrics **Type:** Case Report

Background: Pediatric patients undergoing cardiac surgery are at increased risk of post-operative Acute Kidney Injury. Peritoneal Dialysis has become the treatment modality of choice due to the ease of catheter placement during surgery, although its effectiveness may be affected by external factors.

Case: A 1-day-old male with a post-natal diagnosis of Total Anomalous Pulmonary Venous Return, repaired on day-of-life 2, develops Acute Kidney Injury on post-op day 1. Peritoneal Dialysis was started on post-op day 2 and performed manually with Gesco, achieving daily negative balances. After delayed sternal wound closure on post-op day 3, a wound vacuum was placed. Following this, the patient developed abdominal distension and had an increase in weight of 700 grams despite achieving negative balances, as evidenced in **Table 1**. Pneumoperitoneum was evidenced on abdominal x-ray. The Peritoneal Dialysis catheter did not show signs of a leak: therefore, Peritoneal Dialysis was held and put to drain. Despite this, the patient's pneumoperitoneum worsened. Eventually, it was determined that the wound vacuum was contributing to the pneumoperitoneum by pulling air and fluid back from the drainage tubing into the patient. The wound vacuum was removed on post-op day 5. Peritoneal Dialysis was able to be restarted the following day. Dry weight was achieved within 3 days. The Peritoneal Dialysis catheter was removed on post-op day 11, with stable renal function and no further concerns of fluid overload.

Conclusion: This case illustrates how external factors can interfere with fluid management in patients with recent heart surgery. As clinicians, our role is to assess treatment response and troubleshoot problems that may be affecting dialysis, decreasing the likelihood of complications and improving outcomes.

Table 1. Timeline and relevant data points showing initiation of peritoneal dialysis (grey), development fluid overload despite seemingly effect peritoneal dialysis (red), and the follow-up response after intervention (green).

Post-op Day	Fluid Balance (mL)	Weight (grams)	UOP (cc/kg/hr)	Ultrafiltration (mL)	Creatinine (mg/dL)	BUN
1	-346	2480	1.4	83	0.62	16
2	+51	2490	0.7	153	0.79	29
3	-14	2520	1.7	193	0.73	28
4	-162	2780	1.9	225	0.45	18
5	-65	3000	0.7	229	0.59	24
6	-123	2930	1.3	318	0.44	23
7	-130	2850	0.7	279	0.38	23

#54 Laxative-Induced Contact Burns From Accidental Ingestion of Senna in a 2-Year-Old Female

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Mentor: Ahmad Miri

Program: Pediatrics – Gastroenterology

Type: Case Report

Background: Senna, a natural laxative containing anthraquinone glycosides, stimulates bowel movements. While gastrointestinal symptoms following senna ingestion are well-documented, contact burns secondary to its ingestion are a rare phenomenon, particularly in pediatric patients.

Case: We present a previously healthy 2-year-old female, non-toilet trained, who developed loose stools, erythema, and blisters on her buttocks (Figure 1) after inadvertently ingesting one square of chocolate-flavored senna chew containing 15 mg of Senna. Following clinical evaluation, accidental ingestion of senna was noted as the cause of the burn injury; blisters were ruptured in the emergency room and treated with Bactroban, and oral cephalexin for five days. The pattern of injury raised concerns for physical abuse; a Child Protective Services report was filed, which found no probable cause for abuse. The blisters resolved and healed completely at a follow-up visit.

Conclusion: Senna-induced contact burns is a rare but important clinical entity. Though unclear, the mechanism of action is thought to be due to a reaction to fecal matter and prolonged skin exposure. Literature suggests daytime dosages in children requiring senna for constipation to prevent prolonged overnight contact with diaper stool. These burns typically occur following high doses, prolonged exposure, or overnight contact with a diarrheal diaper. Our case underscores the crucial role of healthcare providers in considering dermatological complications associated with senna ingestion in pediatric patients. It stresses detailed examination and history-taking; crucial to differentiate senna-induced contact burns from physical abuse, which can be incorrectly diagnosed, and emphasizes preventive strategies and healthcare provider awareness.



Figure 1. Erythema, 4-5 cm (about 1.97 in) blisters extending from the medial side of the left buttock, and erythema in the diaper area with swelling and skin sloughing on the buttocks.

#55 A Case of Idiopathic Granulomatous Mastitis

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Mentor: Sarah Lonowski Program: Dermatology

Type: Case Report

Background: Idiopathic granulomatous mastitis (IGM) is a rare, benign inflammatory breast condition, predominantly affecting women of childbearing age. The etiology is unclear, but Corynebacterium species are associated. Reported treatments include antibiotics and immunosuppressants, with surgery as a last resort. Reported treatments include antibiotics and immunosuppressants, with surgery as a last resort.

Case: A 31-year-old, 16-weeks pregnant female presented with a two-month history of a painful, indurated, nonhealing ulceration of the left breast and one month of bilateral erythematous, tender lower extremity nodules. She was previously treated with clindamycin and cephalexin without improvement. A core needle biopsy of the left breast revealed acute and chronic inflammation, reactive fibrosis, and focal granulomatous reaction without malignancy. An initial bacterial swab of the breast grew Corvnebacterium kroppenstedtii, with subsequent negative cultures. The left breast ultrasound demonstrated skin thickening, edema, and phlegmonous change without fluid. Punch biopsy from a leg nodule showed septal panniculitis; tissue cultures (fungal, bacteria, AFB) were negative. Notable laboratory findings showed elevated C-reactive protein (5.7) and erythrocyte sedimentation rate (48), with negative interferon gamma release assay, anti-neutrophil cytoplasmic antibodies, and antinuclear antibody. The chest x-ray was unremarkable. The patient was diagnosed with IGM with secondary reactive erythema nodosum. She was prescribed oral prednisone (30 mg), a 21-day course of amoxicillin, and azathioprine (AZA). Methotrexate (MTX) is an effective treatment for IGM, but AZA was selected due to its safety in pregnancy. Postpartum, AZA, and prednisone were discontinued while MTX (25 mg) and Doxycycline (100 mg) were prescribed, with improvement.

Conclusion: Although rare, we have seen several IGM cases, highlighting the necessity for dermatologists to be well-versed in this condition and its management.

#56 A Case of Hypocomplementemic Urticarial Vasculitis Syndrome

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Mentor: Sarah Lonowski Program: Dermatology

Type: Case Report

Background: A 25-year-old woman with recurrent urinary tract infections (UTI), chronic intestinal pseudo-obstruction of unclear etiology, and short bowel syndrome was admitted for bacteremia and UTI. Dermatology was consulted for urticarial papules coalescing into plaques on her left arm with a history of similar lesions occurring intermittently for several months.

Case: Punch biopsy showed leukocytoclastic vasculitis with negative direct immunofluorescence. Laboratory workup demonstrated low complements C3, C4, and C1q, positive anti-C1q antibody, and negative antineutrophil cytoplasmic antibodies (ANCA). A review of systems was notable for longstanding intermittent abdominal pain, recurrent episodes of dark urine, and difficulty taking deep breaths. Pulmonary function tests showed mild nonreversible obstruction. A kidney biopsy revealed segmental glomerular scars in a vasculitic pattern. The patient was diagnosed with hypocomplementemic urticarial vasculitis syndrome (HUVS). Colchicine and other therapies are currently being considered.

Conclusion: When evaluating patients with urticarial vasculitis, the presence or absence of hypocomplementemia has prognostic value. Normocomplementemia is associated with skin-limited disease while hypocomplementemia is associated with systemic manifestations including musculoskeletal, ocular, pulmonary, renal, and gastrointestinal. HUVS is a rare subtype of hypocomplementemic urticarial vasculitis. Diagnosis requires urticaria for over 6 months and hypocomplementemia (major criteria) plus two or more minor criteria: dermal venulitis, episcleritis or uveitis, glomerulonephritis, recurrent abdominal pain, and positive C1q preciptin test with low C1q level. Our patient meets both major criteria and four minor criteria. Although rare, it is important for dermatologists to be familiar with HUVS to identify patients who may be at risk of developing systemic complications and require multidisciplinary management.

#57 Intralymphatic Histiocytosis of the Left Eyelid: A Rare Condition

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Mentor: Dominick J DiMaio

Program: Dermatology

Type: Case Report

Background: A 61-year-old female presented to the ophthalmology clinic with a complaint of persistent unilateral swelling and intermittent epiphora of the left evelid.

Case: The symptoms began two months prior, after her dog scratched her eyelid. The left upper lid showed pre-septal edema and dermatochalasis. The globe was intact with no evidence of corneal or conjunctival abrasion or intraocular infection and has normal visual acuity.

A head CT scan showed non-specific soft tissue thickening of the left upper eyelid, which could represent resolving pre-septal cellulitis or another inflammatory process. Rigid Endoscopy identified a leftward septal deviation and right inferior turbinate hypertrophy but no underlying cause of the eyelid edema. CT Orbit revealed no evidence of mucosal thickening or obstruction of the sinus ostia.

Thyroid function tests and an inflammatory panel, including IgG4, ESR, CRP, ANA, ANCA, MPO, serine protease, ACE, and neutrophilic cytoplasmic IgG antibodies, were unremarkable. Due to persistent edema despite steroid therapy, a biopsy of the left upper evelid skin was done. The biopsy showed predominantly unremarkable epidermis and dermis with dilated lymphatic spaces, which stained positive for D2-40, CD31, and ERG with aggregates of CD68-positive histiocytes. A diagnosis of intra-lymphatic histiocytosis was made.

Conclusion: This case highlights symptoms that were initially thought to be allergic or sterile inflammatory. The patient was prescribed a Medrol dose pack, which she completed with improvement in erythema but minimal improvement in edema. A longer prednisone taper, combined with Flonase nasal spray, showed moderate improvement. Future treatment options include surgical debulking or intralesional steroids if symptoms persist.

#58 Pre-operative Patient Handout and Anxiety Outcome

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Mentor: Adam Sutton **Program:** Dermatology Type: Original Research

Background: Preoperative anxiety is common and often seen as a significant aspect of surgery. Verbal explanations vary due to work environment, time constraints, and the practitioner's ability to communicate to patient's education level. This study explores the efficacy of enhanced dermatologic procedure handouts with media links in reducing procedural anxiety.

Methods: Resident procedure patients from April 2023 to October 2024 received a pre-procedural handout prior to their excision or electrodessication and curettage procedure. Patients received a post-procedural survey after their procedure. Participation was voluntary, and anonymous.

Results: A total of 39 responses were completed. 36 (94.7%) of patients received handouts regarding excision of a lesion while 2 (5.3%) received the handout on Electrodessication and Curettage. 38 (100%) of patients responded that the handout matched their expectations for the procedure. For 28 (71.8%) patients who received the handout, this was their first procedure. After reviewing the handout post procedure, 11 (28.2%) of patients reported a decrease in anxiety, 7 patients (17.9%) reported a slight increase in anxiety and 21 (53.8%) patients reported no change in anxiety. No statistically significant associations between anxiety levels pre and post procedural after providing the educational handout prior to procedure date reported. #1 concern for patients prior to procedure was pain at 10 (25.6%) prior to procedure, while #1 concern after procedure was infection and wound care at 15 (40%) patients.

Conclusion: Though our study failed to reach statistical significance, 28% of patients did report a decrease in their anxiety levels after reviewing an enhanced preoperative handout with media links.

#59 A Cross-Sectional Analysis of Pediatric Dermatology Exposure in **U.S. Dermatology Residency Programs**

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Mentor: Nicole Harter **Program:** Dermatology **Type:** Original Research

Background: There is a persistent shortage of pediatric dermatologists. Pediatric dermatology is an integral and required component of dermatology residency, and early exposure may increase future career interest. Our objective is to quantify and characterize pediatric dermatology training during dermatology residency.

Methods: This is a cross-sectional analysis of all the Accreditation Council for Graduate Medical Education (ACGME) accredited dermatology residency programs in the United States as of April 4th, 2024. Program websites were queried for information on pediatric dermatology exposure, specialty clinics, pediatric dermatology fellowships, and the number of full-time pediatric dermatologists.

Results: Of 139 dermatology residency programs, 69% had at least one full-time pediatric dermatologist, and 26% offered a pediatric dermatology fellowship. The mean number of full-time pediatric dermatologists was 1.6 at programs with pediatric dermatology fellowships and 1.5 at programs without. 63% of programs published pediatric dermatology exposure in their curriculum. Thirty two percent of programs had pediatric dermatology rotations during the 1st year, 35% during the 2nd year, and 34% during the 3rd year. Pediatric dermatology rotations ranged from 4 to 30 weeks. Thirty two percent of programs with fellowships offered pediatric dermatology rotations in year one compared to 68% of those without. Programs with pediatric dermatology rotations in the 1st year had an average of 2.2 pediatric dermatologists compared to 1.2 without.

Conclusion: Time spent in pediatric dermatology rotations varies dramatically across residency programs, and the presence of full-time pediatric dermatologists and pediatric dermatology fellowships impacts exposure to pediatric dermatology. Providing robust information regarding pediatric dermatology training on program websites may optimize recruitment of trainees interested in pediatric dermatology.

#60 A Mosaic Mutation in the PTEN Gene Causing PTEN Hamartoma Syndrome

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Mentor: Nicole Harter **Program:** Dermatology

Type: Case Report

Background: A 3-year-old-male presented with a history of a bump on his back and a new, asymptomatic lump beneath his right nipple. Between 18 and 24 months of age, his parents noticed a new growth on his back, which was clinically diagnosed as a lipoma. No imaging or biopsy was performed at that time. The patient and family then presented to further discuss the prior diagnosis in the setting of the new chest lump.

Case: The lesion on his back was thus biopsied, with "normal findings" on tissue exam. The chest lesion was subsequently biopsied with results consistent with a lipomatous lesion. Due to multiple lipomatous lesions in this patient, he underwent germline genetic testing and was found to have a pathogenic phosphatase and tensin homolog (PTEN) mutation. The lipoma of the chest was subsequently tested and confirmed to harbor a pathogenic PTEN mutation as well. Further analysis of the germline genetic testing noted a mosaic PTEN mutation, which was notably discovered on analysis of a buccal swab and not only of affected tissue.

Conclusion: PTEN Hamartoma Tumor syndrome is a collective term for a group of genetic disorders linked to germline mutations in the PTEN gene, which confer an increased risk for numerous malignancies and benign skin growths, including lipomas, as seen in our patient. Our case serves as an example that post-zygotic mutations causing PTEN Hamartoma Tumor syndrome can occur, resulting in mosaic phenotypes of these syndromes, and that negative family history and negative germline genetic testing cannot fully rule out this disease.

#61 Pityriasis Lichenoides Et Varioliformis Acuta as the Presenting Sign of an Underlying Torch Infection in Early Pregnancy Resulting in **Pregnancy Loss**

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Mentor: Megan Arthur **Program:** Dermatology

Type: Case report

Background: Pityriasis lichenoides et varioliformis acuta (PLEVA) is generally viewed as a benign, self-resolving cutaneous lymphoproliferative disorder with many associated etiologies. Previous, though rare, case reports of PLEVA in pregnancy have indicated that it may cause premature labor or premature rapture of the membranes.

Case: A 35-year-old gravidity two and parity one otherwise healthy Caucasian female who was 10 weeks pregnant presented to clinic for evaluation of a two-week progressive asymptomatic generalized rash. She denied fevers, chills, body aches, and any recent known illnesses. Physical exam showed scattered red centrally eroded papules and plaques on trunk and upper extremities. Biopsy of a lesion on the left arm demonstrated perivascular and lichenoid interface dermatitis with dyskeratotic keratinocytes, extravasated erythrocytes in the epidermis, and large areas of epidermal necrosis. Clinicopathologic correlation was consistent with diagnosis of PLEVA. Given the patient's active pregnancy, the decision was made in concordance with her obstetrician to start her on oral azithromycin. Additionally, her obstetrician ordered cytomegalovirus (CMV) serologies as part of the recommended TORCH screening- the acronym 'TORCH' refers to well-recognized causes of perinatal infections: toxoplasmosis, rubella, CMV and herpes simplex virus (HSV). Both CMV IgG and IgM were positive, indicating infection within the first trimester. The patient was started on high dose oral valacyclovir to decrease risk of vertical transmission. Unfortunately, our patient experienced pregnancy loss at 17 weeks.

Conclusion: This case highlights a unique presentation of PLEVA secondary to an underlying TORCH infection in pregnancy. Further analysis is needed to determine if reflex TORCH screenings should routinely occur in newly diagnosed PLEVA in pregnant patients and if it would significantly decrease rates of fetal or maternal harm.

#62 Current Management of Skin Conditions in Kenya: Exploring Teledermatology Preferences and Perspectives Among Providers

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Mentor: Jennifer Adams **Program:** Dermatology Type: Original Research

Background: Access to dermatologic care is extremely limited in sub-Saharan Africa, and teledermatology can be a means of providing dermatologic consultations in underserved areas such as Kenva. However, successful implementation of programs such as teledermatology requires careful consideration of the preferences of providers who would be engaging in the service. This study explores current practices and preferences regarding the use of teledermatology among providers in Kenya.

Methods: This was an anonymous cross-sectional web-based survey of providers in Kenya at Aga Khan University Hospital of Nairobi and Kijabi Mission Hospital; it was distributed via WhatsApp groups and email listservs. Responses were collected in REDCap from January-March 2024. Frequencies and percentages were tallied.

Results: Of the 38 providers, 81.6% identified as Black or African, and 81.6% were physicians. While nearly all (97.4%) regularly see patients with skin conditions, only 5.3% felt comfortable diagnosing and treating 80-100% of skin conditions they see on their own. Though most felt teledermatology would be useful (91.9%) and improve patient care (89.5%), only 10.5% were using teledermatology. Dermatologic conditions commonly seen by non-dermatology providers included rashes (84.2%), wounds (65.8%), eczema (63.2%), infectious diseases (55.3%), unclear diagnoses (47.4%), acne (42.1%), and others. Conditions most likely to be referred for teledermatology consultation included rashes (76.3%), unclear diagnoses (63.2%), and infectious diseases (50%), among others. Submitting cases using personal cellphones was regarded as the most convenient submission method for daily workflow (86.8%), and most (87.9%) preferred WhatsApp as the submission platform. Ideal response time was <24 hours for 81.6% of providers.

Conclusion: While nearly all providers in Kenya see patients with skin conditions and often do not feel comfortable managing them independently, few use teledermatology. Providers feel teledermatology would be useful and would improve patient care, and they would generally prefer to submit cases using personal cellphones via WhatsApp and to receive a response in <24 hours.

#63 Hidradenocarcinoma: A Rare but Challenging Sweat Gland Neoplasm

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Mentor: Adam Sutton Program: Dermatology

Type: Case Report

Background: Hidradenocarcinoma is a rare adnexal tumor that can be aggressive. with high rates of recurrence and metastasis. It can be challenging to differentiate from a benign hidradenoma. Lesions often present as an asymptomatic nodule.

Case: A 61-year-old female presented for management of a nodule on her scalp she first noticed fifteen years prior that was asymptomatic until she realized it was enlarging. After biopsy, the patient was discussed at our multi-disciplinary cutaneous tumor board. Recommendations were made for full body PET-CT, sentinel lymph node biopsy (SLNB) with head and neck oncology, and Mohs resection of the tumor with 1 cm margins. The PET-CT was negative for areas suspicious for regional or distant metastasis. Subsequently, the patient underwent SLNB, which was negative.

Conclusion: Hidradenocarcinoma usually occurs in females in their fifties to seventies, most commonly on the head, neck, or extremities. The primary treatment is wide surgical resection. There is a large variation in recommended surgical margins in the literature. These tumors usually have positive staining for cytokeratins, EMA (epithelial membrane antigen), CEA (carcinoembryonic antigen), and S100 protein, similar to other tumors of eccrine origin. Even with surgical resection, tumors can demonstrate recurrence rates of up to 50%. Overall, hidradenocarcinoma has a poor 5-year survival rate of approximately 30% after surgery. Overall, the literature supports surgical excision with careful pathologic margin assessment, SLNB, and PET scan due to the risk of distant metastasis. Larger case series are needed to provide more robust guidelines regarding the treatment of this rare sweat gland neoplasm.

#64 Pediatric Intracranial Non-germinomatous Germ Cell Tumor With **Extracranial Extension: A Case Report**

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Mentor: Christie Barnes **Program:** Otolaryngology

Type: Case Report

Background: Primary intracranial germ cell tumors (GCT) are rare, accounting for only 3-5% of pediatric intracranial tumors. A subset of GCTs is non-germinomatous germ cell tumors (NGGCTs), a heterogenous group of tumors with a poor prognosis. Intracranial GCTs are most commonly located in the pineal or suprasellar regions with few reported cases of frontal lobe lesions. To our knowledge, no reports of intracranial NGGCT with extension into the paranasal sinuses currently exist in the literature. We present a rare case of intracranial GCT with extension into the anterior cranial fossa and erosion into the paranasal sinuses.

Case: An eight-year-old female presented with one week history of worsening frontal headache pain and nausea. CT and MRI imaging (Figure 1) showed a large 4.4 cm mass originating at the level of the cribriform plate with extension into the anterior cranial fossa and inferiorly into the ethmoid and sphenoid sinuses. Transnasal endoscopic evaluation and biopsy were performed for histopathologic evaluation. Pathology and tumor marker results were consistent with NGGCT. Given the size and characteristics of patient's tumor, chemotherapy was selected as an initial therapy with plans for surgical resection and adjuvant radiation therapy.

Conclusion: We present a rare case of intracranial NGGCT localized to the anterior cranial fossa with extracranial extension through the cribriform plate into the paranasal sinuses. Diagnosis of NGGCT combines clinical, radiological, and histological findings along with tumor markers. Accurate diagnosis is important as treatment of NGGCT requires aggressive chemoradiation therapy and often involves one or more surgical resections.



Figure 1. Coronal T2-weighted MRI imaging shows anterior cranial fossa mass demonstrating heterogenous signal intensity with surrounding edema and extension into the ethmoid air cells.

#65 Development of Adult Multidisciplinary Tracheostomy Rounding Teams: Prevalence, Template for Starting and Analysis for Diffusion of Innovation

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Mentor: Jayme R. Dowdall **Program:** Otolaryngology Type: Original Research

Background: Multidisciplinary tracheostomy rounding teams have been found to decrease days to speech and decannulation and decrease adverse events. The need of such teams and the characteristics that increase or inhibit the tracheostomy rounding team's implementation rates have not been well described.

This quality improvement study and intervention aimed to (a) characterize the prevalence of inpatient teams dedicated to adult tracheostomy patients in the Middle Section; (b) describe strategies to develop a dedicated tracheostomy rounding team; (c) discuss plans to optimize Diffusion of the innovation based on Rodgers' 1962 text that will increase adoption at other Middle Section institutions.

Methods: Inquiries were sent to academic departments throughout the programs in the Middle Section of the Triological Society regarding the presence of a dedicated adult team. Two institutions simultaneously formed tracheostomy teams with different strategies.

Results: Only one of the academic departments that responded had a dedicated tracheostomy rounding team for adults. Analyzing the process of our tracheostomy team development, we share strategies to enhance the diffusion process, while recognizing that the time constraints and compensation of the stakeholders involved could be barriers moving forward.

Conclusion: Overall, despite literature demonstrating that tracheostomy rounding teams lead to improved patient care and better navigation of the healthcare system by patients and their families, this type of multidisciplinary intervention is underutilized at many programs. Characterizing the development of a tracheostomy rounding team and creating a collaborative network for feedback and implementation help is necessary for its continued momentum and effectiveness.

#66 The Effects of Gastrostomy Tube Placement on the Utilization of Healthcare Services in Patients Undergoing Free Flap Reconstruction

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Mentors: Elizabeth Bradford Bell, Tony Richa

Program: Otolaryngology Type: Original Research

Background: Free flap reconstruction (FFR) is a mainstay in the surgical treatment of head and neck cancers. Patients who require oral cavity FFR can develop dysphagia, requiring enteral nutrition in the form of a gastrostomy tube (GT). We set out to determine the effects of GT placement on operative times, length of hospitalization, and discharge placement.

Methods: A retrospective chart review of patients undergoing FFR for oral cavity squamous cell carcinoma from 2017-2023 at University of Nebraska Medical Center was conducted. Patients were organized into three groups: patients who received GT prior to FFR ("Pre-operative GT), following FFR but during their hospitalization ("Post-operative GT"), and patients who did not receive a GT ("No GT"). Demographic, clinical, and surgical variables were examined.

Results: A total of 87 patients were identified. Of these, 23, 22, and 42 patients were in the "Pre-operative GT", "Post-operative GT", and "No GT" group, respectively. Patients in the "No GT" group trended towards shorter operative times (566 minutes) compared to the "Pre-operative GT" group (730 minutes) and "Post-operative GT" group (649 minutes). Furthermore, patients in the "Pre-operative GT" group and "No GT" group had similar length of post-FFR hospitalization (9.0 days) compared to patients in the "Post-operative GT" group (14.5 days).

Conclusion: Our study demonstrates that patients undergoing FFR who do not undergo GT placement trended towards shorter operative times, shorter hospitalizations, and less utilization of home health services on discharge. Our results show that GT placement related to oral cavity FFR may indicate increased utilization of healthcare services and healthcare spending.

#67 Self-Removal of a Hypoglossal Nerve Stimulator: Challenges and Lessons Learned

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Mentor: Elizabeth Bradford Bell

Program: Otolaryngology

Type: Case Report

Background: A 44-year-old female with a history of obstructive sleep apnea (OSA), depression, post-traumatic stress disorder, and self-harm presented to the ENT clinic for initial consultation regarding a hypoglossal nerve stimulator (Inspire). Sleep history was significant for Continuous Positive Airway Pressure (CPAP) intolerance, with a recent sleep study showing a qualifying apnea hypopnea index (AHI). Following a diagnostic drug induced sleep endoscopy (DISE), the patient was deemed an appropriate surgical candidate for the Inspire device.

Case: In the months following surgical implantation, the patient made multiple visits to the emergency department, reporting concerns of neck erythema, pain, and dysphagia. These repeated visits would initially be resolved with reassurance and symptomatic management. Despite multiple efforts at reassurance in the both the emergency department and clinic, continued visits would culminate in the discovery that the patient had started picking out her device's stimulating lead. (Figure 1) Subsequently, she was taken back to the operating room for device removal.

Conclusion: This case highlights the complexities of managing OSA in patients with significant psychiatric comorbidities. While implantable devices like Inspire provide alternatives for CPAP-intolerant patients, this case illustrates the need for careful preoperative evaluation, including consideration of present psychiatric conditions. A multidisciplinary approach involving mental health professionals may improve patient selection, optimize outcomes, and mitigate postoperative challenges.



Figure 1. The patient's manipulation of the stimulation lead resulted in its eventual breach of the skin.

#68 Rural Otolaryngology: How do we Create an Oasis in a Healthcare Desert?

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Mentor: Christie Barnes Program: Otolaryngology Type: Original Research

Background: Rural healthcare deserts are defined as geographic areas where medical needs are partially or totally unmet due to insufficient healthcare resources. Ninety-four percent of the population of Nebraska lives in rural or partially rural areas, with 1.8 million people spread over 77,000 square miles. Access to otolaryngology care in the state of Nebraska is especially limited, with primary clinics located in only 10 of the 93 total counties. An estimated 70% of US counties lack access to otolaryngology care. Unique among otolaryngology programs, the University of Nebraska Medical Center (UNMC) has standardized a rural otolaryngology private practice rotation in Kearney, Nebraska.

Methods: We examined the placement of UNMC Otolaryngology Residency graduates across the state of Nebraska since the inauguration of the rural rotation in 2015.

Results: Since 2015, among 27 total residents, seven UNMC Otolaryngology Residency graduates accepted jobs in rural Nebraska counties (**Figure 1**). Of the 7 residents, two took jobs in counties with no prior otolaryngology coverage.

Conclusion: Trainees who participate in rural health programs are more likely to practice in rural settings. The UNMC Otolaryngology Residency rural experience is unique among similar training programs across the country. Since the advent of the rotation in 2015, UNMC-trained otolaryngologists are providing care in more rural and partially rural areas. Further research aims to examine changes in resident perspective before and after a rural rotation, the development of a rural training track, and the effects of expanding rural outreach clinics.



Figure 1. Overview of practicing otolaryngologists in Nebraska. Blue denotes established providers. Yellow denotes UNMC Otolaryngology Residency Program graduates placed since 2015.

#69 Impact of Insurance Status on Progression to Sinus Surgery Following CT Imaging in Patients With Sinusitis

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Mentor: Sam Pate

Program: Otolaryngology **Type:** Original Research

Background: Computed tomography (CT) scans are essential for the diagnosis of sinus disease and operative planning. We aim to assess the rate at which patients with chronic sinusitis progress to sinus surgery following CT scans based on insurance status. We also evaluate the impact of clinical and radiographic staging on progression to surgery with SNOT-22 and Lund-Mackay scores, respectively.

Methods: A single-center retrospective chart review was performed on adult patients who received a CT scan of the sinuses from 2012 to 2023. Data gathered included demographics, insurance status, imaging, clinical metrics, diagnosis, and surgical intervention. Trauma cases were excluded. Chi-squared and t-test were used to examine differences in surgical rates between patients based on insurance status. The UNMC IRB ruled the study exempt.

Results: Two hundred thirty-two patients were identified. The overall rate of progression to surgery following a CT scan of the sinuses was 38.4%. Patients with private insurance progressed to surgery at higher rates than patients with public insurance, with 43.2% vs 29.7%, respectively (p = 0.042). The average Lund-Mackay score was 6.4 ± 3.8 for patients who progressed to surgery vs 2.7 ± 2.7 for patients who did not (p < 0.0001). There was no significant difference in SNOT-22 scores between surgical and non-surgical patients with 42.7 ± 20.8 vs 39.6 ± 18.5 , respectively (p = 0.41) (**Figure 1**).

Conclusion: Patients with private insurance were more likely to proceed to sinus surgery after receiving a CT scan compared to those with public insurance. Lund-Mackay scores were more predictive of progression to surgery than SNOT-22 scores.

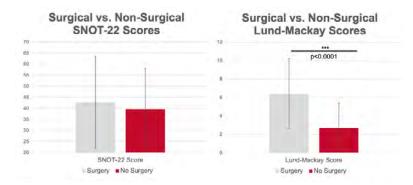


Figure 1. SNOT-22 and Lund-Mackay scores in surgical vs non-surgical patients.

#70 Impact of Associations With Travel Distance on Staging at Initial Presentation and Survival in Oral and Oropharyngeal Cancer

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Mentor: Elizabeth Bradford Bell

Program: Otolaryngology **Type:** Original Research

Background: Socioeconomic factors have well-documented impacts on oral and oropharyngeal squamous cell carcinoma (SCC) outcomes. We aim to evaluate the impact of travel distance on stage and survival.

Methods: Hospital-based multicenter retrospective review of adult patients with oral and oropharyngeal SCC in the National Cancer Database from 2018-2021. Adjusted odds ratios (AORs) for advanced diagnoses were derived from logistic regression models. Cox proportional hazards regressions were used to generate adjusted hazard ratios (AHRs) for survival.

Results: A total of 37,062 patients were identified with mean age of 63.6 years, 74% male, and 13% non-white race. Oral SCC accounted for 43% and oropharyngeal SCC 57%. Among patients with oral SCC, there was a lower adjusted risk of death in those that lived 50 (AHR=0.83, 95% CI: 0.75-0.91) or 100 miles away (AHR=0.73, 95% CI: 0.65-0.81) relative to 10 miles away. Among patients with oropharyngeal SCC, there was a lower adjusted risk of death in those that lived 50 miles away (AHR=0.74 95% CI: 0.65-0.83) and 100 miles away (AHR=0.64, 95% CI: 0.55-0.75) relative to 10 miles away (Figure 1). Among patients with oropharyngeal SCC, patients had lower adjusted odds of being diagnosed at stage 3-4 relative to those who lived 10 miles away if they lived 50 (AOR=0.83, 95% CI: 0.75-0.90) or 100 miles away (AOR=0.77, 95% CI: 0.69-0.86).

Conclusion: Patients with greater distance to treatment tended to have a decreased risk of death in oral and oropharyngeal SCC. Those with greater distance to treatment had lower odds of presenting with advanced oropharyngeal SCC.

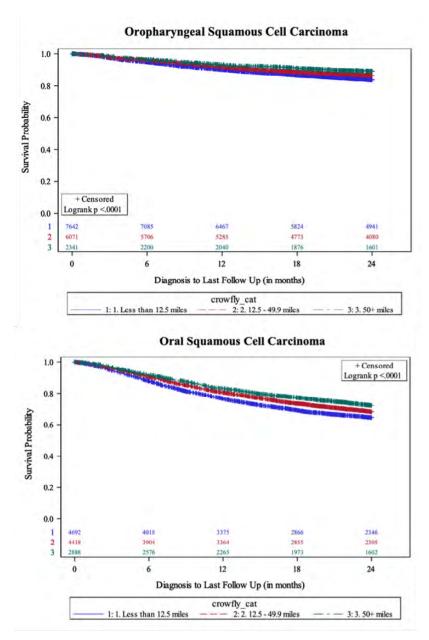


Figure 1. Product-limit survival estimates with number of subjects at risk and 95% confidence limits.

#71 Gastrointestinal Kaposi Sarcoma – An Underdiagnosed and More **Common Entity Than We Think**

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Mentor: Suha Jabak

Program: Internal Medicine - Gastroenterology & Hepatology

Type: Case Report

Background: Kaposi sarcoma (KS) is an angioproliferative neoplasm caused by human herpesvirus-8 occurring in ~30% of patients with advanced HIV. KS presents with cutaneous and/or visceral involvement, with 50% of cases affecting the gastrointestinal (GI) tract, though only 20% have symptoms. Visceral KS has a poor prognosis as lesions can lead to hemorrhage and morbidity/mortality. There are no guidelines for endoscopic screening of GI-KS in advanced HIV in the United States.

Case: A 27-year-old male was diagnosed as an outpatient with HIV. He was lost to follow-up for six months until he was hospitalized for dyspnea/fever and diagnosed with Pneumocystis jiroveci pneumonia. Workup showed CD4 count 139 cells/µL, HIV viral load 140,000 copies/mL, and purple nodular lesions on his back, foot, groin, and hard palate with biopsies revealing KS. Antiretroviral therapy (ART) was initiated. Gastroenterology was consulted for iron deficiency anemia and hematemesis. Esophagogastroduodenoscopy revealed numerous hemorrhagic vascular nodules of various sizes carpeting the stomach (Figure 1). Biopsies confirmed GI-KS, and Doxorubicin was initiated for advanced KS. Colonoscopy was not performed due to bowel preparation intolerance. Hospitalization was complicated by cardiac tamponade with KS in pericardial fluid, respiratory failure, and septic shock. The patient passed away with comfort measures two months after admission.

Conclusion: Advanced HIV-related KS has decreased with ART, but providers should remain vigilant as most cases are clinically silent, and visceral lesions can contribute to mortality. Screening EGD/colonoscopy should occur in advanced HIV with cutaneous KS lesions, CD4 <100, or in men who have sex with men, based on Japanese research suggesting these factors increase GI-KS likelihood.





Figure 1. Esophagogastroduodenoscopy showing numerous large hemorrhagic vascular nodules throughout the stomach.

#72 Diarrheal Dilemma – A Case of Post Car-T T Cell Lymphoma Presenting as Refractory Diarrhea

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Mentors: Kathryn Hutchins, Sarah Malik

Program: Internal Medicine

Type: Case Report

Background: Chimeric Antigen Receptor T-cell (CAR-T) Therapy is becoming an increasingly popular treatment option for managing refractory leukemia and lymphoma. The FDA announced an investigation into CAR-T regimens due to an increase in secondary cancers following therapy. One rarely cited secondary cancer is T-cell lymphoma after ciltacabtagene autoleucel (Cilta-cel) in patients with multiple myeloma (MM). We present a case of refractory diarrhea secondary to small bowel T-cell lymphoma.

Case: A 75-year-old male with a history of multiple myeloma presented to the emergency department with profuse watery diarrhea four months after completing Cital-cel therapy. He had recently been hospitalized for the same, with a negative colonoscopy and infectious workup. A CT scan indicated intra- and extrahepatic biliary ductal dilation with subsequent MRCP showing a CBD dilation requiring stent placement. Additional testing showed a stool osmotic gap consistent with osmotic diarrhea and elevated gastrin. EGD with EUS showed no masses. Subsequent EGD with biopsy discovered cytotoxic CD4+ T-cells in intestinal mucosa. The patient was diagnosed with CAR-T cell associated T-cell lymphoproliferative disorder of the small bowel. Infliximab was initiated with concern for autoimmune etiology; however, diarrhea worsened. Ultimately, he was switched to high dose steroids and became stable for discharge.

Conclusion: CAR-T is a popular treatment for managing refractory leukemia and lymphoma. Our patient experienced a rare adverse effect months after treatment, which is not well documented in the literature. He was eventually diagnosed with refractory diarrhea caused by the development of CD4-positive T-cell lymphoma in the small bowel following treatment with Ciltacabragene Autoleucel.

#73 Virtual Versus Dye Chromoendoscopy in Dysplasia Detection in Patients With Inflammatory Bowel Disease: A Systematic Review and Meta-analysis

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Mentor: Kathryn Hutchins

Program: Internal Medicine – Gastroenterology & Hepatology

Type: Review

Background: Epithelial dysplasia is a risk for colon cancer in patients with long-standing inflammatory bowel disease. The rates of dysplasia detection using virtual-based versus dye-based chromoendoscopy remain controversial. Therefore, we conducted a systematic review and meta-analysis to analyze the available data on this topic.

Methods: We identified potentially eligible studies from the MEDLINE and EMBASE databases, searching from inception to September 2024, to compare the differences in virtual-based (VCE) and dye-based chromoendoscopy (DCE) in detecting dysplasia. To be included, studies needed to compare dysplasia detection rates between both DCE and VCE. Effect size and 95% confidence intervals (CIs) were combined using the generic inverse variance method. All statistical analyses were performed by Review Manager 5.4.

Results: Our meta-analysis included ten studies that met the eligibility criteria. There were 1,332 participants, with a mean age of 50.7 years, and 52% were males. We found that patients undergoing DCE have a higher rate of detecting dysplasia when compared to VCE with a pooled odds ratio (OR) of 1.56 (95% CI: 1.08 - 2.26; $I^2 = 36\%$; P = 0.02) (**Figure 1**).

Conclusion: Our study revealed that DCE is superior in detecting dysplasia lesions. Large scale cohort studies may be required to reinforce this relationship.

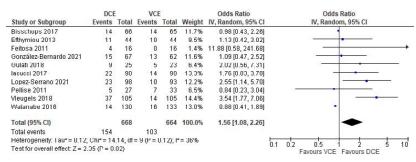


Figure 1. The forest plot demonstrated a pooled odds ratio of dysplasia detection rates for VCE compared to DCE.

#74 Encephalitis as the Initial Manifestation of Leptomeningeal Carcinomatosis in Gastric Cancer: A Diagnostic Challenge

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Mentor: Amy Dreessen

Program: Internal Medicine

Type: Case Report

Background: Gastric cancer (GC) is one of the leading causes of cancer deaths worldwide, with a five-year survival of metastatic disease at <5%. Bone metastasis in GC is uncommon and not well studied. Leptomeningeal carcinomatosis is exceedingly rare in GC, with an incidence of <1%. Nearly all previously reported cases of bone or meningeal involvement of metastatic GC were in patients with known advanced GC.

Case: One week following viral meningitis diagnosis, a previously healthy 32-yearold female presented with progressive neurologic symptoms including photophobia,
headache, and confusion. Leukocytosis was improved from previous. Erythrocyte
sedimentation rate, C-reactive protein, and lactate remained elevated. She had
episodes of posturing and seizure activity with signs of autonomic dysfunction and
was intubated for airway protection. Repeat MRI was remarkable for new leptomeningeal enhancement, which was not present one week prior. She was evaluated
by neurosurgery, who placed an emergent external ventricular drainage for cerebrospinal fluid (CSF) diversion. Meanwhile, extensive neurologic, infectious, and
autoimmune workup remained negative. Work up for autoimmuneencephalitis and
paraneoplastic syndrome was negative. Whole-body position emission tomography
was notable for numerous fluorodeoxyglucose avid osseous lesions, favored to
represent metastatic disease without evidence of a primary tumor. Ultimately, CSF,
bone biopsy, and esophagogastroduodenoscopy revealed poorly differentiated metastatic gastric adenocarcinoma.

Conclusion: This case demonstrates an extremely unusual presentation of gastric adenocarcinoma. Bone and leptomeningeal metastasis are individually uncommon in gastric cancer. The finding of either as the initial presenting sign of GC is rare and has been reported in less than five cases.

#75 Abdominal Fullness, Constipation, and Panniculitis in Acinar Cell Carcinoma of the Pancreas

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Mentor: Kelsey Klute

Program: Internal Medicine

Type: Case Report

Background: Pancreatic acinar cell carcinoma (PACC) is a rare type of exocrine pancreas neoplasm (1-2%) which can cause lipase hypersecretion and resultant subcutaneous fat necrosis ("pancreatic panniculitis"). We present the case of a 66-year-old female who presented with abdominal fullness and skin lesions with PACC.

Case: The 66-year-old female presented with abdominal fullness, hyperglycemia and painful, erythematous skin nodules. Her lipase level was >5000 U/L. She was started on Creon based on symptoms. CT A/P did not visualize a discrete mass in the pancreas typical of adenocarcinoma but showed a heterogenous mass-like prominence in the pancreatic head, with heterogenous expansion of the portal venous system compatible with tumor thrombus. Endoscopy ultrasound revealed a hypoechoic lesion in the pancreatic head, and a biopsy showed metastatic, nonsmall acinar cell carcinoma with +trypsin stain. A biopsy of a skin lesion was nondiagnostic.

The tumor was deemed unresectable, and she was initiated on modified folinic acid, fluorouracil, irinotecan and oxaliplatin (FOLFIRINOX). After 2 months of chemotherapy, her lipase level decreased to 866 U/L, and a restaging CT scan showed decreasing soft tissue density adjacent to the pancreas and improvement in the size and density of extensive tumor thrombus. She also experienced significant regression of the skin lesions after the initiation of systemic chemotherapy.

Conclusion: Acinar cell carcinoma of the pancreas is a rare neoplasm which can be associated with pancreatic panniculitis. This case demonstrates how skin conditions can be a harbinger of an underlying malignant disease.

#76 Hepatology Handbook for Hospitalists, A Retrospective Analysis

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Mentor: Marco Olivera-Martinez Program: Internal Medicine

Type: Original Research

Background: In-hospital mortality for patients with chronic liver disease remains a major health concern in the United States. Although cirrhosis patients in the Midwest maintain higher odds of survival, national in-hospital mortality rates range from 6.6% to 25.5% for those admitted for chronic liver disease and acute-onchronic liver failure, respectively.

Methods: A Hepatology Handbook for Hospitalists was embedded into the electronic medical record at the University of Nebraska Medical Center as a quality improvement initiative in November 2023. A retrospective analysis of 602 admissions to internal medicine or family medicine for alcohol withdrawal or chronic liver disease was performed to assess differences in patient survival and ICU duration in the 6 months pre- and post-intervention.

Results: Although no statistical differences were observed, a trend toward improved survival (p = 0.2179) was noted among chronic liver disease family medicine admissions.

Conclusion: Lack of survival benefit among those admitted to internal medicine groups may be explained by admission of patients with more advanced chronic liver disease or greater familiarity with decompensated cirrhosis management prior to intervention. Future analyses will focus on quantifying handbook utilization as well as any need for revising the guide with medical updates.

#77 A Distended Dilemma: The Quetiapine Quandary in Ogilvie's Syndrome

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Mentor: Sarah Malik

Program: Internal Medicine

Type: Case Report

Background: Acute colonic pseudo-obstruction (Ogilvie's syndrome) is characterized by acute colonic dilation in the absence of mechanical obstruction. It predominantly affects males over 60, often in the context of severe illness or post-operative state, with metabolic abnormalities or culprit medications. We present the first documented case of Ogilvie's syndrome associated with quetiapine.

Case: A 69-year-old male with recently diagnosed lung adenocarcinoma presented after being found down. Initial evaluation revealed intracranial hemorrhage with newly identified brain metastases.

Dexamethasone was initiated for cerebral edema, but the patient developed acute agitation, prompting scheduled quetiapine. He soon experienced nausea, vomiting, abdominal pain, and distention. Initial abdominal x-ray suggested adynamic ileus, absent on admission computed tomography. Despite an aggressive bowel regimen with stimulant and osmotic laxatives, stool softeners, suppositories, and enemas, his condition worsened

Serial x-rays revealed progressive cecal dilation to 11.2 cm, consistent with Ogilvie's syndrome. Quetiapine was discontinued, and neostigmine administered, resulting in temporary improvement. However, his cecal diameter later increased to 13.5 cm (**Figure 1**). He remained stable and underwent planned neurosurgery. Subsequent computed tomography imaging confirmed resolution of Ogilvie's syndrome with continued conservative management.

Conclusion: This patient developed Ogilvie's syndrome acutely while hospitalized with normal electrolytes and no identifiable triggers except quetiapine. While antipsychotics like clozapine and olanzapine are known to increase the risk for Ogilvie's syndrome due to anticholinergic and antiserotonergic properties, quetiapine has not been previously implicated. Given its common use inpatient for agitation, recognizing quetiapine's potential to trigger Ogilvie's syndrome in at-risk individuals is important.



Figure 1. Cecal dilation up to 13.5 cm as indicated by the white line.

#78 Percutaneous Transhepatic Cholangioscopy: New Horizons for Challenging Biliary Interventions

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Mentor: Lei Yu

Program: Interventional Radiology

Type: Case Report

Background: Percutaneous Transhepatic Cholangioscopy (PTCS) is an innovative approach for challenging biliary pathologies. It allows direct visualization of the biliary system for diagnostic and therapeutic interventions, including biopsy, biliary stone retrieval, lithotripsy, foreign body removal, and laser treatment of biliary strictures. In patients with altered anatomy following surgery and those who have failed Endoscopic Retrograde Cholangiopancreatography (ERCP), PTCS provides an alternative approach to manage biliary issues. We present a case of challenging biliary intervention aided by cholangioscopic guidance.

Case: Patient is a 74 y/o male with a history of gastric adenocarcinoma status post total gastrectomy and roux-en-y esophagojejunostomy. He has a long history of choledocholithiasis, which has resulted in multiple prior episodes of cholangitis. ERCP was attempted for stone removal, however, it was unsuccessful due to the inability to reach the jejunojejunostomy anastomosis. Interventional Radiology was consulted for percutaneous transhepatic stone removal. Percutaneous transhepatic access to the biliary tree was obtained, and cholangiogram demonstrated multiple biliary stones and severe narrowing of distal common bile duct. A biliary catheter was placed for drainage while the fistula tract matured. The patient was brought back 4 weeks later for cholangioscopy. PTCS system was introduced through the access, and multiple 1-2 cm biliary stones were visualized directly. The stones were fragmented using electrohydraulic lithotripsy. Balloon sweep was performed to push stone fragments into the small bowel. The structure was dilated with an 8mm balloon. The biliary drain was replaced and successfully removed at a follow up visit.

Conclusion: PTCS is a safe and effective treatment option for challenging biliary cases, especially in patients with post-surgical anatomy when traditional ERCP is unfeasible

#79 Is Generative Al Being Used in the Creation of Personal Statements in Emergency Medicine Residency Applicants?

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Mentor: Wesley Zeger

Program: Emergency Medicine

Type: Original Research

Background: A significant component of Emergency Medicine (EM) residency application is the Personal Statement , assessing experiences, motives, and ability to communicate in a written format. Artificial intelligence (AI) writing aids have gained notoriety in the last 6 years as programs such as the GPT series demonstrated capabilities for generating human-like writing samples. The primary objective of this study was to investigate the potential use of AI in creating the PS for EM residency applications.

Methods: Retrospective review of applicant's personal statements submitted to an academic EM residency program, between Sept of 2018-Jan 2023. AI detectors GPTZERO, Winston AI, and ContentAtScale were used for this purpose. Descriptive statistics summarized the data. Continuous measures were compared between groups using ANOVA. Chi-square looked at associations of categorical variables with AI classification groups. The correlation of readability from GPT and Winston was evaluated using Pearson correlation coefficient.

Results: There was a strong correlation between GPTZERO and Winston readability (r = 0.81; p < 0.0001). Only ContentAtScale identified different groups related to potential AI detection, therefore was used to compare other AI measurements and demographic groupings. No statistically significant interactions of gender, region, or race/ethnicity were identified between groups.

Conclusion: Our findings suggest that no consistent AI use was detected. AI tools may help enhance EM residency personal statements without introducing demographic biases. However, the findings also raise questions about the accuracy of AI detectors and the ethical considerations of using AI in personal narratives.

#80 Improvements in Physician and Staff Comfort & Efficiency With Clinical Procedures

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Mentor: Kelsey Noble

Program: Clarkson Family Medicine

Type: Original Research

Background: Clinical procedures in family medicine encompass a wide range of procedures, from simple biopsies to more complex ones such as colposcopies and exercise stress tests. Residents in training and the clinical staff who support them may not be familiar with the full scope of procedures available or how to most efficiently complete these procedures within the clinic setting. Our goal was to study perceptions of office procedures, identify real or perceived barriers to completion, implement changes to address these concerns, and evaluate for perceptual change.

Methods: Pre- and post-intervention surveys of perceived difficulty completing procedures (on a 10-point scale) and main barriers to completing office-based procedures (short answer) with perceived strength of the barrier scored 1-5. Surveys were completed by both family medicine residents and clinical staff. To be eligible for surveying, residents and staff had to be present at Clarkson Family Medicine for > 6 months and have completed or assisted in at least 5 office-based procedures in the past 6 months. Perceived difficulty and total barrier score were compared using paired T-tests.

Results: Surveying is still in progress at this time, but initial results suggest that written instructions, clear responsibilities for each team member, and improved reference materials improve physician and staff confidence in procedural completion.

Conclusion: Preliminary results suggest these changes significantly improved residents' and staff's perceptions of difficulty completing procedures. Further work may involve both additional procedural workshops and following the clinic longitudinally to see if total procedures retained within the clinic increase.

#81 Mycoplasma Genitalium: An Under-Diagnosed Sexually Transmitted Infection

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Mentor: Kelsey Noble

Program: Clarkson Family Medicine

Type: Case Report

Background: This is a case of delayed diagnosis of a symptomatic sexually transmitted infection (STI) of *Mycoplasma genitalium*.

Case: A 25-year-old male presented to a primary care clinic complaining of scant urethral discharge and urethral irritation that was worse after urination. Medical history included hypertension and migraines. Symptoms had been present for approximately six weeks. He had presented for care twice previously. At his first clinic encounter, he tested negative for gonorrhea and chlamydia from throat and urine samples but was treated empirically with a weeklong course of doxycycline, which provided an improvement in symptoms but incomplete resolution. In his second clinic encounter, he tested negative for urine gonorrhea and chlamydia and negative for serum HIV and syphilis antibodies. His sexual partner was also reportedly negative. At this follow up appointment, testing was expanded to include a urinalysis, urine culture, urine trichomonas, and Mycoplasma and Ureaplasma PCR genital swab. The physical exam was normal. Results were notable for positive leukocyte esterase and positive Mycoplasma genitalium. Symptoms responded well to treatment with one-week course of doxycycline followed by one-week course of moxifloxacin.

Conclusion: *M. genitalium* is a sexually transmitted bacterial infection that has similar incidence rates to *Neisseria gonorrhea* and *Chlamydia trachomatis*, however, it is not routinely included in STI testing. It also requires a different treatment course than other STIs. Therefore, patients with this infection are at risk of missed or delayed diagnosis, which may increase the incidence of complications from this infection and contribute to the increasing prevalence of the organism.

#82 Investigating the Efficacy and Safety of a Dose-Dense Paclitaxel, Cyclophosphamide With Trastuzumab in Stage I-II Human Epidermal Growth Factor Receptor 2 (HER2) Positive Breast Cancer

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Mentor: Jairam Krishnamurthy

Program: Clarkson Family Medicine

Type: Original Research

Background: The evolution of systemic therapies has improved outcomes for patients with human epidermal growth factor receptor 2-positive (HER2+) breast cancer. Nonetheless, the tolerability and safety profile of systemic therapies represent an area for further improvement. Here, we report the results of a phase II trial evaluating a non-anthracycline, non-platinum adjuvant treatment regimen for patients following initial surgical resection.

Method: The study was approved by the Institutional Review Board (IRB) (IRB#318-15). We enrolled patients with stage I or II HER2+ breast cancer who underwent upfront surgery to receive adjuvant treatment with 6 cycles of dose-dense Paclitaxel, cyclophosphamide and Trastuzumab (PC-H) every 2 weeks, followed by 13 cycles of maintenance trastuzumab every 3 weeks to complete 52 weeks of treatment (comprising 19 cycles). The primary objective was to determine the safety and feasibility of adjuvant PC-H measured by the completion rate and the frequency and the grade of adverse events, using National Cancer Institute Common Terminology Criteria. The secondary objective was to estimate relapse-free survival and overall survival.

Results: Between 2010 and 2019, a total of thirty-nine patients were enrolled. Of those, 34 patients (87.18%) completed the planned treatment. Severe adverse events of grade 3 or 4 occurred in 27 patients (69.23%), including 3 patients (7.69%) with grade 3-4 decrease in ejection fraction. At median follow up of 5.6 years, all 39 patients were alive. The 5-year relapse-free survival was 94.30% (95% CI: 75.3-100).

Conclusions: PC-H regimen demonstrated overall safety and efficacy, yielding high rates of relapse-free survival among patients with early stage (HER2+) breast cancer.

#83 Hitchhiking Spider: A Case of Unilateral Vasculitis

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Mentor: Anna Kozlowski

Program: Clarkson Family Medicine

Type: Case Report

Background: Dermatologic reactions secondary to spider bites can be difficult to diagnose and manage because spiders must be identified by a qualified professional. Herein, we highlight a case of unilateral vasculitis with a professionally identified hobo spider.

Case: A 63-year-old man presented with two days of palpable purpura over the right anterior shin and calf with notable point tenderness on the distal mid-calf without any palpable deep abnormality. Localized right calf pain worsened with walking and was associated with headache, chills, fatigue, and low-grade fevers. A punch biopsy of the anterior right lower leg showed necrotizing neutrophilic vasculitis of superficial and deep vessels. Direct immunofluorescence showed non-specific focal granular deposition of C3 within vessel walls. Three days after the presentation, a live spider was found and microscopically identified as a male hobo spider. The patient suspected the spider arrived via packages shipped from Seattle, Washington. The patient was treated with a prednisone taper with full resolution of his cutaneous symptoms. Given the unilaterality of his symptoms and otherwise unexplained etiology, the patient was diagnosed with acute unilateral vasculitis secondary to hobo spider bite. Microscopic examination is required for identification of hobo spiders. Although not deadly, there have been several reports of cutaneous and systemic reactions resulting from hobo spider bites.

Conclusion: Our case illustrates the importance of considering hobo spider bites in areas outside of their native regions, as they are known to travel in packaged items.

#84 Perspectives From a Family Medicine Residency Program on **Future Intent for Providing Obstetrical Care**

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Mentor: Kelsey Noble

Program: Clarkson Family Medicine

Type: Original Research

Background: In recent years, the role of family medicine physicians in obstetric care has garnered increasing attention, especially concerning the continuity of practice post-residency. This study examines data from a family medicine residency program to evaluate the trends and experiences of residents who choose to practice obstetrics after completing their training.

Methods: The anonymous survey gathered data electronically from participating residents regarding their experiences and intent to practice obstetrics post-residency via a combination of questions aimed to quantify demographic information, training experiences, and perceived confidence levels in obstetrical skills. There was also an opportunity to elaborate on motivations for pursuing obstetric practice and any recommendations on how to further shape obstetrical experiences/mentorship while in residency. Statistical analyses were conducted on quantitative data, while qualitative responses were subjected to thematic analysis to identify common trends and insights.

Results: Five of the eighteen residents polled intend to provide obstetrical care postresidency. Of those who noted they would not be providing this modality of care, 15% blamed lack of training, 46% expressed disinterest, 8% noted bad experiences, and 30% selected "all of the above" to the previous.

Conclusion: This data, alongside the available literature, highlights that fewer family medicine physicians plan to provide obstetrical care for various reasons, some of which include lack of training/exposure, disinterest, work-life balance, evolving landscape of healthcare policies, etc. This study contributes limited, yet valuable insights into the dynamics of family medicine training and its impact on the future workforce

#85 Diabetic Ketoacidosis in a Patient With Type 2 Diabetes Mellitus and Ketosis Prone Diabetes

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Mentor: Kelsey Noble

Program: Clarkson Family Medicine

Type: Case Report

Background: This is a case of a patient with type 2 diabetes mellitus (T2DM) presenting with diabetic ketoacidosis (DKA) instead of the typical hyperosmolar hyperglycemic state.

Case: A 54-year-old female presented to the emergency department due to 1 week of fatigue, polyuria, and polydipsia. Medical history included type 2 diabetes mellitus, hypertension, hyperlipidemia, obesity, and diffuse idiopathic skeletal hyperostosis (DISH). She had been diagnosed with T2DM six months earlier with an HbA1C of 6.6. She chose lifestyle modifications as treatment. On arrival, her glucose was greater than 800, and she had a high anion gap metabolic acidosis with beta hydroxybutyric acid of 3.6, which met the criteria for DKA. She required an insulin infusion with frequent glucose checks and metabolic panels to correct the abnormalities. A repeat HbA1C was 12.5, and type 1 diabetes labs for autoimmunity were obtained, and all were negative. Endocrinology was consulted and recommended long acting, short acting, and correction insulin. In addition, per their review of the patient's presentation and lab results, it was speculated that she may have atypical ketosis prone diabetes. She was discharged home and followed up with endocrinology outpatient and has had improvement in her A1c and has been able to reduce her diabetic medication dosages.

Conclusion: There is a subtype of type 2 diabetes known as ketosis prone diabetes where an individual may require high doses of insulin for a short period of time but can show rapid improvement in their HbA1C. Furthermore, research has shown that there are more subtypes of type 2 diabetes that predispose patients to more accelerated advancement to CKD, cardiovascular disease, retinopathy, and neuropathy, which makes the screening for diabetic complications important.

#86 A Rare Case of Benign Locally Aggressive Hamartoma- Facial Infiltrating Hamartoma

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Mentor: Allison Cushman-Vokoun

Program: Pathology - Molecular Genetic Pathology

Type: Case report

Background: Fewer than 80 cases of facial infiltrating hamartoma (FIL) have been reported in the literature. It was first described by Slavin in 1983 as a rare form of facial developmental malformation. In 2014, somatic mutations in the phosphatidylinositol 3-kinase catalytic subunit alpha (PIK3CA) gene in abnormal tissues from six FIL patients were identified. A subset of cases can show epidermal nevi, hyperplasia, and deformity of maxillofacial bones and/or hemimegalencephaly. There is no standardized treatment protocol. Surgical debulking is the mainstay of treatment with a high recurrence rate. Targeted PI3K inhibition (Alpelisib) reduces the adipose volume and improves functionality.

Case: We present a case of a 9-year-old female patient with a history of asymmetric right facial swelling involving maxillary and mandibular regions with infraorbital hyperpigmentation on the right. Previous surgical removal of a right scalp lipoma was noted. Imaging showed asymmetrically increased subcutaneous fat along the entire right side of the face with fatty infiltration and enlargement of the right parotid and submandibular glands and right masseter muscle (Figure 1A). Deformities of the bony maxilla and mandible with asymmetric thickening were also present (Figure 1B-C). No brain abnormalities, including hemimegalencephaly, were identified. Surgical debulking was performed. Histopathologic examination of the tissue showed lobules of mature adipose tissue with interspersing fibrous tissue. Next generation sequencing identified PIK3CA c.3140A>G (p.H1047R) and TSC2 c.5051_5068+16dup (p.D1690Gfs*27) with variant allele frequencies of 24% and 23.9%, respectively.

Conclusion: FIL is a rare disease with no standardized treatment and a high recurrence rate after surgical debulking. PI3K inhibition (Alpelisib) reduces overgrowth, vascular lesions, and other functional complications.

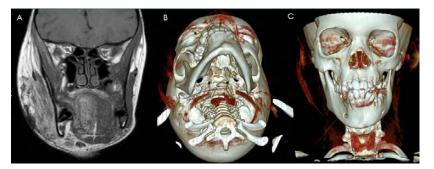


Figure 1. Imaging findings: **A**, Asymmetrically increased subcutaneous fat along the right face with fatty infiltration and enlargement of the right parotid gland and right masseter muscle. **B & C**, Deformity of the bony maxilla and mandible with asymmetric thickening.

#87 A Single Institutional Experience of FLT3-ITD in Genetically Rearranged Acute Myeloid Leukemias

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Mentor: Safina Hafeez

Program: Pathology – Hematopathology

Type: Original Research

Background: The feline McDonough sarcoma (FMS)-like tyrosinase kinase 3 (FLT3) gene is the most frequently somatically mutated gene in acute myeloid leukemia (AML), with internal tandem duplication (FLT3-ITD) mutations being the most common. FLT3 testing is recommended in all AML diagnoses, given they portend a worse prognosis. The goal of our study was to find the frequency of FLT3-ITD in genetically rearranged AMLs and to compare the overall survival among FLT3-ITD mutated and unmutated patients.

Methods: The Institutional Review Board approved this study. A search for new acute myeloid leukemias in our database from 2020-2024 yielded 267 cases. Data was obtained for genetic abnormalities, FLT3-ITD, and time interval between the diagnosis and last follow-up or death. The cases were classified as AML with defining genetic abnormalities based on the WHO 5th edition of hematolymphoid tumors.

Results: We found 100 cases of AML with defining genetic abnormalities. Of the 100, 66 were FLT3-ITD negative and 34 were positive. Of these, 47 cases (47%) had defined rearrangements, with 41 cases FLT3-ITD negative and six cases positive (12.8%). Of the six positive cases, five patients were alive until the last day of follow-up (2.2-44.5 months). Of the negative cases, 10 patients died of the disease (range of survival, 0.3-12.4 months). No follow-up data available for three patients. There was no significant difference in survival between the two groups (p = 0.67) (**Figure 1**). AML with nucleophosmin-1 (NPM1) mutation was the most common AML enriched in FLT3-ITD (82%, 28/34).

Conclusion: FLT3-ITD is uncommon in AMLs with defining genetic rearrangements and there is no significant difference in survival between FLT3-ITD negative and positive cases.

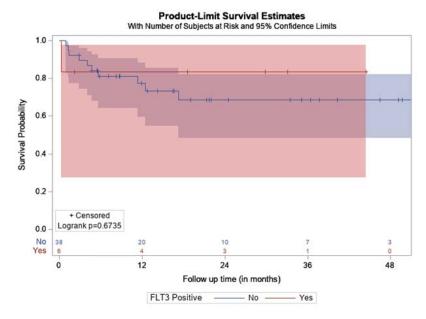


Figure 1. Survival curves comparing FLT3 positive patients to FLT3 negative patients.

#88 Diagnostic Accuracy of Whole Slide Imaging of Helicobacter Pylori Immunostains When Rare Organisms Are Present

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Mentor: Benjamin J. Swanson

Program: Pathology **Type:** Original Research

Background: *Helicobacter pylori* (HP) is estimated to affect ⁵0% of the world's population and is a risk factor for peptic ulcers, gastric lymphoma, and gastric carcinoma. Untreated HP cases have abundant organisms easily seen by IHC stain. However, PPIs cause rare, degenerating features which are difficult to assess on IHC, especially using digital pathology. Therefore, we sought to see how well HP organisms could be identified on IHC with digital pathology (**Figure 1**).

Methods: Twenty-three cases with a diagnosis of "rare" HP organisms (1-5) and forty-eight cases of chronic inflammation without HP infection were reviewed. Cases with significant chronic inflammation served as controls. All IHC slides were digitally scanned and blindly reviewed by two GI pathologists and one GI fellow to determine if HP organisms were present or absent. Results were compared to the original glass slide diagnosis.

Results: The average accuracy rate of correctly identifying HP organisms on digitally scanned slides was 82.2%. Specificity ranged from 83.3% -100%, with an average of 91.67%. Sensitivity ranged from 43.5% - 73.9%, with an average of 62.32%. The positive predictive value was 78.18%, and the negative predictive value was 83.54%.

Conclusion: The identification of rare HP organisms on IHC digitally scanned slides is not equivalent to IHC on glass slides. Although the specificity was high and false positives were low, a low sensitivity indicates cases of HP infections would be missed by the evaluation of digitally scanned slides alone. Therefore, glass slide evaluation of HP IHC should still be the gold standard while digital pathology technology improves.

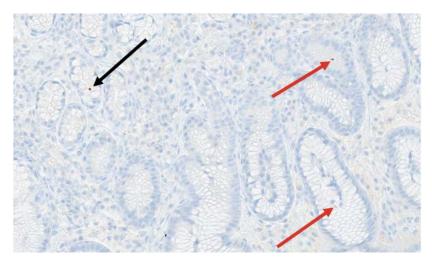


Figure 1. Rare *Helicobacter pylori* (HP) on IHC. The black arrow denotes a single coccoid HP organism. The red arrows denote possible HP organisms.

#89 Extent of Primary Gleason Pattern 4 Carcinoma Predicts Adverse Outcome Independent of Tertiary Pattern 5 in Prostatectomy Specimens

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Mentor: Subodh M. Lele

Program: Pathology

Type: Original Research

Background: Higher Gleason grades demonstrate increased risk of biochemical recurrence and advanced (metastatic) disease in radical prostatectomies. Prior literature has shown that tertiary pattern 5 in radical prostatectomies is a poor prognostic factor for disease progression. Our aim in the current study was to compare the clinical behavior based on radical prostatectomy assessment of limited versus extensive Gleason pattern 4 carcinoma in the presence or absence of tertiary pattern 5.

Methods: Our pathology database was searched for prostate carcinoma cases which had Gleason score 4+3=7 on prostatectomy. Cases were classified into Gleason score 4+3=7 with tertiary pattern 5 and less than 20% tumor volume (limited pattern 4), and Gleason score 4+3=7 with more than 20% tumor volume (extensive pattern 4). Follow-up information was obtained. The study was approved by our institutional review board.

Results: Of a total 1664 radical prostatectomies (2014-2022), 108 prostatectomies with Gleason score 4+3=7 were reviewed. More than 95% of the cases had been diagnosed and graded by one of the authors. Twenty-five cases had Gleason score 4+3=7 with tertiary pattern 5 and less than 20% tumor volume. Thirteen of 25 cases (52%) were high stage (pT3), while 2 of 25 cases (9%) had biochemical recurrence (mean recurrence free survival = 22 months). Seven cases had Gleason score 4+3=7 with more than 20% tumor volume. Five of 7 cases (71%) were high stage (pT3), while 3 of 7 cases (43%) had biochemical recurrence (mean recurrence free survival 21 months).

Conclusion: Extent of involvement by primary Gleason pattern 4 carcinoma in radical prostatectomies predicts adverse outcome independent of tertiary pattern 5.

#90 Institutional Review of Outside Pathology by Experienced Gynecologic Pathologists Results in Improved Patient Care in a Significant Number of Cases

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Mentor: Subodh M. Lele

Program: Pathology

Type: Original Research

Background: Review of gynecologic pathology cases by experienced institutional pathologists upon patient referral is important as the clinical team relies on their expertise to determine the best treatment option. Our goal was to assess the number of such cases with disagreement with the outside pathology results and clinical outcome of each case.

Methods: Our pathology database was searched for cases that were sent to our gynecologic pathology consultation service over 5 consecutive years. Cases were classified as discordant if there was a significant change in the diagnosis (benign versus malignant), tumor grade, stage, histologic type, or primary site of origin. Follow-up information on discrepant cases was obtained.

Results: A total of 282 gynecologic consult cases were studied. Of these, 24 cases (9%) were discrepant. These included 3 ovaries, 1 fallopian tube, 16 uterine, and 4 cervical cases. We changed the diagnoses of the ovarian cases from benign cyst to borderline change, identified granulosa cell tumor, and changed endometrioid adenocarcinoma to metastatic colorectal adenocarcinoma. The common revisions for uterine and cervical cases included upgrading endometrioid carcinoma from low to high grade, adding a second carcinoma component (mixed carcinoma), removing a second carcinoma component, reclassifying carcinoma to carcinosarcoma and endometrial stromal sarcoma to leiomyosarcoma, identifying high-grade cervical squamous dysplasia, and reclassifying squamous cell carcinoma to small cell carcinoma. All cases with follow-up data (mean 54 months) had a clinical course that matched the behavior expected from the revised diagnoses.

Conclusion: Academic institutional review of outside pathology by experienced gynecologic pathologists results in improved patient outcomes in a significant number of cases.

#91 Institutional Review of Outside Pathology by Experienced Breast Pathologists Results in Improved Patient Care in a Significant Number of Cases

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Mentor: Subodh M. Lele

Program: Pathology

Type: Original Research

Background: Review of breast pathology cases by experienced institutional pathologists upon patient referral is important as the clinical team relies on their expertise to determine the best treatment option. Our goal was to assess the number of such cases with disagreement with the outside pathology results and clinical outcome of each case.

Methods: Our pathology database was searched for cases that were sent to our breast pathology consultation service over 4 consecutive years. Cases were classified as discordant if there was a significant change in the diagnosis (benign versus malignant), tumor grade, stage, histologic type, or primary site of origin. Follow-up information on discrepant cases was obtained.

Results: A total of 175 breast consult cases were studied. Of these, 28 cases (16%) had disagreements. These included changes in tumor grade (15), Ki-67 index (6), stage (1), Her2/neu interpretation (1), classification of ductal epithelial hyperplasia (3), and assessment of residual tumor post-therapy (2). The most common revisions included upgrading of carcinoma, identifying lymph node micrometastasis, lowering the Ki-67 index (by more than 10%), reclassifying immunohistochemistry (IHC) Her2/neu expression scores from negative to 2+ (with subsequent positive fluorescence in situ hybridization (FISH) results), reclassifying atypical ductal hyperplasia to usual ductal hyperplasia, reclassifying usual ductal hyperplasia to ductal carcinoma in situ, and identifying foci of residual invasive cancer post-therapy. All cases with available follow-up (mean 27 months) had a clinical course that matched the behavior expected from the revised diagnoses.

Conclusion: Academic institutional review of outside pathology by experienced breast pathologists results in improved patient care outcomes in a significant number of cases.

#92 High-Yield Grossing Guides With One-on-One Instruction Prior to Each Rotation Focused on Error-Prone Areas Significantly Lowers **Errors in Pathology Trainees**

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Mentor: Subodh M. Lele **Program:** Pathology **Type:** Original Research

Background: For pathology trainees, oncologic specimens are difficult to describe and sample correctly as they involve detailed attention to multiple parameters that can significantly impact the diagnosis. The goal of the study was to supply focused instruction on complex breast, gynecologic (GYN), and genitourinary (GU) specimens and determine if such instruction resulted in a lower error rate

Methods: Our institutional database was studied to identify grossing errors for breast, GYN, and GU cases that required additional sectioning or amendments to the gross interpretation. High-yield grossing guides (text, photographs, and references) were created and provided to the trainees prior to each rotation and periodic meetings were conducted. The grossing quality/error rate was assessed prospectively.

Results: A total of 150 reports on breast, GYN, and GU resections were screened retrospectively, and 40 complex cases were identified (27%). Fourteen of 40 cases (36%) had grossing errors. These were divided into minor – wording (14%), missing information (7%); and major – insufficient sampling (43%), inaccurate margin assessment (14%), and improper sectioning (22%). After supplying pre-rotation grossing guides with one-on-one instruction, a prospective review identified 50 of 250 complex cases to show grossing errors (error rate reduction from 36% to 20%). Sampling errors reduced from 43% to 23%, while margin sampling errors reduced from 14% to 3%. Turnaround time improved by 30% as the need to re-sample diminished.

Conclusion: High-yield grossing guides with brief one-on-one instruction prior to each surgical rotation focused on specific error prone areas significantly lowers the grossing error rate in pathology trainees and improves patient safety.

#93 Breaking the Mold: An Atypical Presentation of Systemic Mucormycosis

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Mentor: Jill Zabih

Program: Internal Medicine-Pediatrics

Type: Case Report

Background: Mucormycosis is an invasive fungal infection among immunocompromised patients. The most common presentation is rhino-orbital infection. Retropharyngeal abscesses are rare manifestations with few cases reported in literature. The purpose of this case is to describe a fatal case of mucormycosis originating from a retropharyngeal abscess in a young patient with type I diabetes.

Case: An 18-year-old female with type 1 diabetes and recent culture-negative peritonsillar abscess refractory to first-line antibiotics presented with odynophagia, neck pain, and diabetic ketoacidosis. CT neck demonstrated fluid in the retropharynx, which was surrounding and completely occluding the right internal carotid artery. She was intubated and started on broad spectrum antibiotics.

I&D specimen grew *Candida albicans* and few respiratory florae. Although the patient's inflammatory markers initially improved with narrowed antibiotics, her neck pain persisted. Histopathologic examination demonstrated necrosis and granulation tissue, concerning for aspergillosis vs. mucormycosis. Microbial cell-free DNA testing confirmed the diagnosis of mucormycosis, and she was started on liposomal amphotericin B. Subsequent CT neck demonstrated angioinvasive disease and skull base osteomyelitis. The patient elected to continue IV Amphotericin and was discharged home with hospice, knowing that the mortality risk of aggressive debridement outweighed the very low likelihood of cure.

Conclusion: A high index of suspicion for atypical presentations of mucormycosis is needed in immunocompromised individuals who present with infectious symptoms, particularly when the patient fails first-line treatment. Furthermore, cell-free DNA PCR techniques will lead to reduced mortality and improved outcomes for patients with invasive fungal infections through early diagnosis and prompt initiation of targeted therapy.

#94 An Autopsy Case of Polymicrobial Cardiac Abscesses With Cultured *K. Pneumonia* in the Setting of Hyperosmolar Hyperglycemic State

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Mentor: Erin Linde Program: Pathology Type: Case Report

Background: Though rare in a time of broad-spectrum antibiotic use, pericardial abscesses continue to occur and can further evolve into pericarditis. Those with immunocompromised states and those of older age are at a greater risk for abscess development, and the more common etiologies of bacterial-caused pericardial abscess include S. aureus and S. pyogenes.

Case: We present the case of a decedent with a limited history who was found dead in his residence. Postmortem investigation revealed a hyperosmolar hyperglycemic state through ancillary biochemical testing, and gross and microscopic examinations demonstrated polymicrobial pericardial purulence and cardiac abscesses with cultures positive for K. pneumoniae.

Conclusion: As one of a limited number of Klebsiella pneumoniae-caused pericardial abscesses, our case demonstrates the need for proper gross inspection and ancillary laboratory testing to best determine a specific cause of death.

#95 A Comparison of Scar Infiltration, Scar Deactivation, and Standard of Care for Treatment of Chronic, Post-Surgical Pain After Cesarean Section in the Primary Setting: A Comparative Effectiveness Trial

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Mentor: Stephen Cagle

Program: Family Medicine

Type: Original Research

Background: Scar acupuncture deactivation (SD) and infiltration (SI) compared against physical therapy (PT) for reduction of chronic pain in the postpartum period after low-transverse cesarean (LTCS).

Methods: Unblinded randomized controlled trial for 16 weeks of therapy and a 20-week follow-up in outpatient military clinics. Participants were Tricare beneficiaries ≥3 months post-partum, ≥18 years with abdominal and/or back pain following a LTCS. Sixty enrollees were randomized to receive SI, SD, or PT every 2 weeks. Patient and Observer Scar Assessment (POSAS) and Defense and Veterans Pain Rating Scale (DVPRS) scores measured pain reduction. Chi-square tests and ANOVA assessed continuous variables.

Results: DVPRS declined in the PT, SD, and SI groups by -42.7%, -54.4%, and -63.5%, respectively. SD was associated with a stronger decline in POSAS score compared to PT (interaction regression coefficient = -0.29, 95% CI -0.54 to -0.04, p = 0.0217). Although the point estimate for SI was negative, change over time compared to PT was not significant (interaction regression coefficient = -0.20, 95% CI -0.45 to 0.05, p = 0.1179). No significant interactions were observed for SD and SI. DVPRS increased in the PT group from week 16 to week 20 by 1.8 points. SD and SI scores continued to decrease after completing treatment.

Conclusion: All groups demonstrated a reduction in DVPRS and POSAS. Only PT had a worsening DVPRS and POSAS scores between weeks 16 and 20. SD and SI improved scores from week 16 to week 20. SD had the most sustained improvement at 20 weeks.

#96 The Truth Lies in Her Eyes

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Mentor: T. Jason Meredith Program: Family Medicine

Type: Case Report

Background: Infectious mononucleosis (IM) is contagious and spread via bodily fluids. Symptoms are indolent; may take 4-6 weeks. Periorbital edema (Hoagland sign), a possible early symptom, may occur after fever onset, before exudative pharyngitis, cervical lymphadenopathy; may not be initially present. Team physicians need high suspicion for IM if an athlete presents with periorbital edema without cause

Case: National Collegiate Athletic Association female rower presented for concussion evaluation. Concussion suffered 1 day prior, struck by an oar to the back of the head. Immediate headache and blurry vision; headaches improved but now with difficulty focusing on objects. Friends noticed bilateral upper eyelid swelling. Denied swelling in her extremities. Took NSAIDs for headaches but no longer. The patient was advised to continue University's Concussion Protocol and follow up in 48 hours; now with worsening fatigue and a desire to sleep all day. Eyelid swelling also worsened. Reported URI symptoms 1 week before the concussion.

Conclusion: IM diagnosis was reviewed, and it was discussed that IM may explain the remaining symptoms. Updated American Medical Society of Sport Medicine guidelines on return to play after diagnosis were reviewed with the athlete, coaching staff. The patient was held from normal concussion RTP exercise protocol. Supportive cares for conservative management recommended for remaining symptoms. Symptoms resolved at 2 week follow up. The patient was started on supervised low-intensity cardio training with gradual increase over 1 week. No splenic imaging was completed. The patient returned to full activity 4 weeks after the initial presentation and completed her collegiate season.

#97 A Sweet Kick of Relief

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Mentor: Sara McCall

Program: Family Medicine

Type: Case Report

Background: Chondromalacia patella can be a common cause of patellofemoral pain, which is a frequent complaint seen by clinicians. Physical therapy and oral anti-inflammatory medications continue to be first line treatment. Intra-articular injection therapy may be helpful but has shown inconsistent results. Currently, there are no reported studies involving injections to the patellar facets. Dextrose prolotherapy (DPT) may be effective in providing sustained relief in patients who do not respond to the above measures.

Case: A 36-year-old female presents with chronic bilateral knee pain with associated feelings of instability. She has been experiencing symptoms in her left knee for many years. She started to develop the same symptoms in her right knee but worse. She has no known history of knee injury. Her symptoms are worse with bending, squatting, and going up or down stairs. She completed multiple sessions of physical therapy but reports it has not provided any relief. She had 2 bilateral dextrose prolotherapy (DPT) intra-articular injections, which did not provide relief. In this case, a new approach was attempted where the patient underwent 2 palpation-guided DPT injections consisting of 0.5mL 1% Lidocaine and 0.5mL 50% dextrose at the bilateral medial and lateral patellar facets at a 1-month interval.

Conclusion: After a series of 2 DPT injections to the bilateral medial and lateral patellar facets, the patient was able to increase her activity and return to running, as well as stairs and squatting. She experienced significant sustained relief, reporting 75% improvement in her symptoms for approximately 10 months.

#98 Cold Truths Exposed: An Uncommon Culprit of Neonatal **Hypothermia**

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Mentor: Aleisha Nabower Program: Family Medicine

Type: Case Report

Background: Neonatal hypothermia is often a sign of underlying pathology, with neonatal sepsis being the most concerning possible etiology. This case represents the importance of considering adrenal insufficiency, especially when hypothermia is persistent or recurrent.

Case: A 3-day-old term male born vaginally after induction due to fetal growth restriction presented with hypothermia, poor feeding, 10% weight loss and decreased responsiveness. Initial workup for neonatal sepsis, including blood cultures and herpes simplex virus testing, was negative. A lumbar puncture was attempted but not successful after many attempts. IV antimicrobials were initiated. After clinical improvement on days 2-4, the infant developed recurrent hypothermia (35.4C) on day 5, prompting return to isolette and reevaluation. Further testing revealed low cortisol (1.6), elevated adrenocorticotropic hormone (65.6), and inadequate response on ACTH stimulation test, leading to the diagnosis of primary adrenal insufficiency.

Conclusion: This case highlights the diagnostic challenge of neonatal adrenal insufficiency, a rare disease, occurring is 1:10,000-20,000 live births. While 90% of cases are detected on the newborn screen, high suspicion is needed to diagnose the other 10% which is often misdiagnosed as sepsis, metabolic disorders, or cardiovascular disease. Deterioration despite adequate treatment in patients with hypothermia, as this case shows, should prompt further examination of the suspected diagnosis, including assessment for adrenal insufficiency.

#99 An Atypical Cause of Headache in an Athlete

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Mentor: T. Jason Meredith **Program:** Family Medicine

Type: Case Report

Background: Hemicrania continua (HC) is a primary headache disorder in the category of trigeminal autonomic cephalgias characterized by persistent unilateral headache (HA), ipsilateral autonomic symptoms (i.e. lacrimation, conjunctival injection, congestion/rhinorrhea, eyelid edema, facial sweating, miosis/ptosis), restlessness or agitation, and aggravation of pain with movement. Diagnosis requires symptom duration greater than 3 months and an absolute response to treatment with indomethacin.

Case: A 22 year old National Collegiate Athletic Association tennis player presented to the training room with 2 days of severe, constant, unilateral HA that woke her from sleep the night prior. Pain was located in the retro-orbital, frontal, and temporal regions. Associated with photophobia, phonophobia, vision changes, nausea, agitation, irritability, and intermittent ipsilateral conjunctival injection. Denied previous HA history. No preceding trauma, neck pain, rash, or fever. No association with menses. Trialed ibuprofen, acetaminophen, and sumatriptan without improvement. The following day, she presented to the ER for worsening, debilitating symptoms; received Reglan and Toradol with only short term, mild relief in symptoms. At follow-up 2 days later, her HA persisted (same location/distribution and associated symptoms).

She was seen virtually by a local neurologist who treated with prednisone burst and rizatriptan; unfortunately, this did not provide sufficient relief. She was subsequently admitted to our academic inpatient team for intractable HA and neurology consultation. Labs and imaging were negative. While inpatient, she was treated with IV Decadron and started indomethacin ramp-up therapy. HA was aborted with indomethacin.

Conclusion: This case represents a rare cause of headache in an athlete that responds to a specific headache treatment, indomethacin.

#100 Temporal Trends of Obesity Among Nebraska Adults: EMR Data Shows a More Rapid Increase Than Projected

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Mentor: Birgit Khandalavala Program: Family Medicine

Type: Original Research

Background: Obesity data is typically obtained from national population surveys, while the use of more accurate electronic medical record (EMR) data is underutilized. The objective of this study is to calculate current obesity prevalence and weight trends using EMR data and compare the results to prior survey-based obesity prevalence projections for the state.

Methods: This retrospective study analyzed Body Mass Index (BMI) from deidentified EMR data from 16,491 adult patients in urban midwestern primary care clinics between January 2017 and October 2021 for obesity prevalence and weight trajectories, stratified by age and gender.

Results: There was a large discrepancy between the survey-based self-reported rates of obesity (35.5%) and those calculated from baseline EMR data (47.6%), along with a smaller discrepancy in females (47.9%) compared to males (47.2%). Young adults aged 20 to 29 years showed a larger increase in BMI over time compared to other age groups. Figure 1 compares the 2021 Nebraska obesity prevalence to the 2030 projections reported by Ward et al. (2019).

Conclusion: EMR-derived data indicates a prevalence of obesity greater than projections that have been based on self-reported survey data as well as higher weight trends than projected for this midwestern state. As evident from our study, cohorts such as at-risk young adults with a more rapid weight gain trajectory should be prioritized for enhanced obesity management.

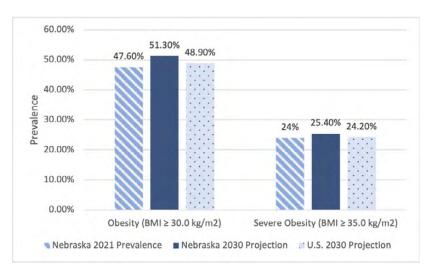


Figure 1. Comparison of the 2021 Nebraska obesity prevalence to the 2030 projections, as reported by Ward and colleagues (Ward et al. *N Engl J Med.* 2019;381(25):2440-2450).

#101 The Hamate: An Unexpected Fracture

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Mentor: T. Jason Meredith

Program: Family Medicine – Primary Care Sports Medicine

Type: Case Report

Background: Hook of the hamate fractures are often seen in sports, presenting with ulnar-sided palmar hand/wrist pain. Definitive diagnosis typically requires advanced imaging.

Case: A 20-year-old male baseball player presented for evaluation of left dorsoulnar wrist pain. The pain started after a round of golf one month prior. No inciting trauma. He initially ignored the pain and continued to practice on it; however, worsening of pain led to an evaluation. The pain worsened with catching pitches and completing batting practice. Mild improvement with rest and anti-inflammatories. No improvement with soft tissue modalities. No prior injuries to that hand/wrist. On examination, vitals were normal. The patient appeared comfortable and was in no acute distress. Left hand/wrist demonstrated no erythema, warmth, atrophy, ecchymosis, or obvious deformity. Tender over the dorsal surface of the hand/wrist at the base of the 5th metacarpal and hamate bone. Non-tender over the palmar aspect of the hamate. Hand and wrist demonstrated full active and passive range of motion (ROM). Pain at end ranges of wrist extension and ulnar deviation. Sensation was intact.

Xray of the wrist and hand was unremarkable. Diagnostic injection at the carpometacarpal and hamate joints provided no relief.

MRI showed non-displaced fracture of the hook of the hamate.

Conclusion: The final diagnosis was fracture of the hook of the hamate. Surgery was performed to remove the fractured hook. Therapy started immediately postoperatively, focusing on swelling reduction and ROM. Six weeks post-op, the player was allowed to return to baseball related activities. He had no further pain and played out the season without limitations.

#102 The Effect of Pitch Clock Rules on Pitching Injuries in MiLB From 2012 to 2024

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Mentor: T. Jason Meredith

Program: Family Medicine - Primary Care Sports Medicine

Type: Original Research

Background: The impact of pitch clock rules in professional baseball on pitcher health and safety remains unclear. This study examines the relationship between pitch clock regulations and the number of days pitchers spent on the injury list (IL) in minor league baseball (MiLB).

Methods: Data was obtained from a public database containing all MiLB IL entries for the 2012-2024 seasons. Pitching injuries were separated into three groups: Group 1 (no pitch clock rules), Group 2 (original pitch clock rules), and Group 3 (updated pitch clock rules with disengagement limits). A one-way ANOVA, Tukey's post hoc tests, Levene's test, and effect size calculations were completed.

Results: In total, 11795 injuries were reported across the 2012-2024 seasons and included in the analysis. Significant differences were observed among the groups in days spent on the IL (p < 0.001). Group 3 exhibited the highest mean injury duration (total n injuries = 3271, days on IL = 53.88 +/- 54.05 days), followed by Group 1 (total n injuries = 5340, days on IL = 44.11 + -45.35 days) and Group 2 (total n injuries = 3184, days on IL = 39.54 + -45.74 days). Tukey's post hoc tests revealed that Group 3 had significantly higher injury durations compared to Groups 1 and 2 (p < 0.001 for both comparisons).

Conclusion: The updated pitch clock rules were associated with longer appearances on the IL, suggesting potential unintended consequences of increased game pace and limited disengagement opportunities. These findings highlight the need for further investigation into the physical demands and recovery implications of pitch clock regulations.

#103 Corneal Confocal Microscopy as a Tool for Detecting Axonal Degeneration in Multiple Sclerosis and Correlations With Severity: A Meta-Analysis

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Mentor: Evanthia Bernitsas

Program: Neurology

Type: Review

Background: There exists a need for reliable, non-invasive biomarkers to detect axonal degeneration in people with multiple sclerosis (pwMS). Unlike retinal fiber layers, corneal nerve fibers are not affected by optic neuritis. This study explores the role of corneal confocal microscopy (CCM) in detecting axonal degeneration in pwMS and its correlation with severity.

Methods: A literature search was conducted across PubMed, Scopus, and Google Scholar. Differences in corneal nerve fiber density (CNFD), corneal nerve fiber branch density (CNBD) and corneal nerve fiber length (CNFL) between pwMS and healthy controls were quantified using risk ratio (RR) and estimated using random effects models due to high observed heterogeneity. Random-effects meta-regression was utilized to evaluate the relationship between severity and CNFD, CNFL and CNBD.

Results: A total of 8 studies were included with 351 pwMS. CNFD and CNFL were lower in pwMS compared to controls (Effect Size = -1.53, 95% CI: [-2.62, -0.44], p = 0.01). Meta-regression analysis (**Figure 1**) showed that CNFD (Mean b = -1.93, 95% CI [-3.32, -0.55], p = 0.01), CNBD (Mean b = -33.36, 95% CI [-48.90, -17.82], p < 0.01) and CNFL (Mean b = -2.31, 95% CI [-2.94, -1.68] p < 0.01) had significant associations with Multiple Sclerosis Severity Score (MSSS) but not with Extended Disability Severity Score (EDSS).

Conclusion: CCM can be a non-invasive imaging biomarker for axonal degeneration in pwMS. Additionally, MSSS had clear inverse associations with CNFD, CNFL and CNBD. However, CNBD might be a potential marker of neural regeneration, more than degeneration.

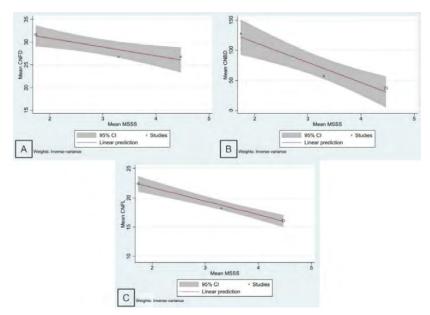


Figure 1. Bubble plots for the meta-regression evaluating association between each of **(A)** CNFD, **(B)** CNBD, and **(C)** CNFL, and EDSS. The X-axis shows the mean EDSS, while the Y-axis shows **(A)** CNFD, **(B)** CNBD, and **(C)** CNFL. Each bubble represents a study with the size of the bubble being proportional to the individual study weight. The solid red line shows the fitted regression line with the slope representing direction and magnitude of the association. The shaded gray area represents the 95% confidence interval.

#104 Assessing the Impact of a Resident Wellness Curriculum: A Retrospective Study in an Internal Medicine Residency Program

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Mentor: Samy McFarlane

Program: Internal Medicine – Hospice & Palliative Medicine

Type: Original Research

Background: Residency training is a crucial career development period with high levels of stress and potential burnout. Wellness curriculums have been proposed as a solution, yet their impact remains underexplored in residency programs. This study assessed a resident-led wellness curriculum in an Internal Medicine residency program in Brooklyn, New York, focusing on resident awareness, program performance, and feedback.

Methods: A retrospective study in May 2024 utilized a 20-point questionnaire distributed to residents across Post-Graduate Year (PGY) levels. The curriculum, based on the American Medical Association's (AMA) six aspects of wellness, was integrated into outpatient rotations. Expert-led talks covered burnout, sleep hygiene, nutrition, fitness, financial planning, emotional health, and relationships. Statistical analysis included Chi-squared tests, with significance set at p < 0.05.

Results: Out of 90 total residents, 48 (53%) participated in the survey. PGY-1 residents constituted 19 (40%) respondents. Twenty eight (58%) respondents reported awareness of AMA-defined wellness, and 40 (83%) expressed satisfaction with the curriculum. Supportive program leadership and work-life balance were the most valued aspects. Forty one (85%) respondents recommended continuing the curriculum, suggesting improvements such as increased hospital support staff, upgraded computer systems, mental health workshops, addressing workplace culture, and team outings during didactics. Attendance at the wellness talks was high, underscoring resident engagement.

Conclusion: The implemented wellness curriculum addressed critical aspects of resident well-being, with increased levels of awareness and resident satisfaction. Resident feedback emphasized the importance of addressing organizational challenges, fostering a supportive workplace culture, and expanding the curriculum to better address resident needs

#105 Optimizing Cardiothoracic Surgical Stewardship via Echocardiography in a Resource-Limited Setting: A Case Report

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Mentor: Megan Chacon

Program: Anesthesiology – Adult Cardiothoracic

Type: Case Report

Background: Worldwide, rheumatic disease is the most common cause of mitral stenosis. We present an aborted mitral valve replacement in a sub-Saharan African country due to echocardiographic findings that imparted an increased risk of inability to separate from cardiopulmonary bypass.

Case: A 51-year-old male with a history of symptomatic severe mitral stenosis related to rheumatic disease and a previous mitral valve reconstruction 30 years prior presented with worsening symptoms. Preoperatively, the right heart catheterization revealed biventricular dysfunction and mixed pulmonary hypertension. Optimization was attempted with diuresis. At presentation, he was tachycardic (120 beats per minute in 2:1 rapid atrial flutter) and normotensive. The surgical plan included mechanical mitral valve replacement and tricuspid valve repair with an annuloplasty ring. After induction, a comprehensive transesophageal echocardiographic exam found severe rheumatic mitral stenosis with restricted leaflet motion and commissural fusion (Figure 1) and severe right ventricular dysfunction. Before incision for redo sternotomy, an extensive multidisciplinary discussion resulted in deferring the case in anticipation of potential referral to a comprehensive or primary valve center.

Conclusion: In this case, symptoms consistent with stage D mitral stenosis, severe annular calcification, and prior reconstruction necessitated definitive surgical replacement. The constellation of findings above and the potential for left ventricular outflow tract obstruction upon separating from cardiopulmonary bypass pose difficulty for capable comprehensive valve centers, let alone under-resourced facilities. As a result of echocardiography, we were able to adjust for the risk of morbidity and mortality in real-time, altering plans in an environment potentially unsuitable for a major redo cardiothoracic surgery.

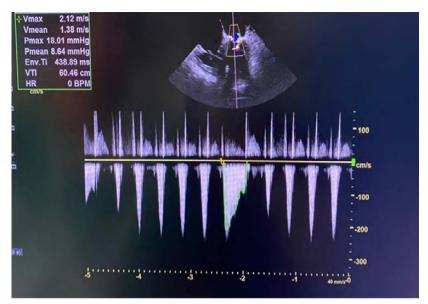


Figure 1. Transesophageal mid-esophageal four-chamber view with pulse wave Doppler of mitral inflow indicative of severely stenotic rheumatic mitral valve. Mean pressure gradient ~9 mmHg with systemic pressure 117/65 and atrial flutter with rates in the 120s.

#106 Extracorporeal Membrane Oxygenation (ECMO) and Abdominal Complications in Adults: Identifying the Risk Factors

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Mentor: Shaun Thompson Program: Anesthesiology Type: Original Research

Background: Extracorporeal membrane oxygenation (ECMO) is an invasive, advanced form of respiratory or circulatory support. ECMO is not without risk, and various complications may arise. We examined abdominal complications that occurred in an adult patient population during or after receiving ECMO support.

Methods: A total of 98 patients were included in this retrospective review, approved by the Institutional Review Board. Evaluated comorbidities included peripheral arterial disease, coronary artery disease, stroke, congestive heart failure, hypertension, chronic obstructive pulmonary disease, chronic kidney disease, diabetes, obesity, liver disease, neurological disorders, cancer, chronic hematologic disease, organ transplant, and immunosuppressive disorders. Social factors included a history of tobacco, alcohol, or drug use. Abdominal complications included gastrointestinal bleeding, abdominal compartment syndrome, ischemic colitis, mesenteric ischemia, renal failure requiring dialysis, or the need for endoscopy or laparotomy.

Results: In this study, 65 patients (66.3%) experienced an abdominal complication. Coronary artery disease (p = 0.02) and obesity (p = 0.01) demonstrated statistical significance. Additionally, ECMO type (veno-arterial vs veno-venous), ECMO pump brand, downtime before ECMO, cardiac arrest prior to ECMO, vasopressor use, length of stay, need for Interventional Radiology intervention, and number of days intubated were evaluated. The length of intubation (median 4.5 vs 11 days, p = 0.03) and vasopressor use (p = 0.001) demonstrated statistical significance.

Conclusion: The results of this study highlight the association between cardiovascular health and recovery from illness. Coronary artery disease and obesity, in particular, lead to an increased risk of abdominal complications in patients on ECMO. Moreover, there is an increased risk of complications in patients requiring prolonged intubation or vasopressor support.

#107 Perioperative Risk of Aspiration and Postoperative Complications With GLP-1 Therapy (PROTECT) Study

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Mentor: Kathryn Hutchins Program: Internal Medicine

Type: Original Research

Background: Perioperative guidelines advise against Glucagon-like peptide-1(GLP-1) agonist due to the risk of aspiration. There is a relative lack of data regarding the risk or incidence of aspiration and postoperative complications in patients using GLP-1s. We investigated the incidence of perioperative aspiration and postoperative complications in patients using GLP-1s.

Methods: A single-center retrospective review was conducted on deidentified patients with diabetes who underwent non-emergent procedures requiring anesthesia between January 2017 and October 2023. Descriptive statistics summarized patient demographics and outcomes. An independent samples t-test assessed differences in continuous variables of interest between patients on GLP-1s and those not on GLP-1s. Chi-square or Fisher's exact test was applied to compare all categorical variables of interest between groups. Analyses were performed using SAS version 9.4.

Results: A total of 20,808 patients were included in the analysis. Of these, 502 patients used a GLP-1, and 383 took additional diabetes medications. There was no significant difference in aspiration pneumonia rates (0.2% vs. 0.6%, P = 0.54) or pneumonia rates (2.2% vs. 2.2%, P = 0.95) while taking a GLP-1 (**Table 1**). Those without a GLP-1 faced a 4.16 (95% CI: 2.59 - 6.67) higher risk of aspiration pneumonia.

Conclusion: We investigated the incidence of aspiration and gastrointestinal complications associated with the use of GLP-1 during the perioperative and postoperative periods, with and without other diabetes medications. This study supports the growing literature indicating no significant increase in aspiration complication rates linked to perioperative GLP-1 use. Patients using GLP-1 experienced statistically significant postoperative constipation and higher rates of bowel obstruction and ileus.

Table 1. Perioperative outcome results with and without GLP-1 agonist use.

Table 3: Outcomes				
	GLP1			
	No	Yes	Total	
	(N=20306)	(N=502)	(N=20808)	P-value
Pneumonia, n (%)				0.951
No	19852 (97.8%)	491 (97.8%)	20343 (97.8%)	
Yes	454 (2.2%)	11 (2.2%)	465 (2.2%)	
Aspiration Pneumonia, n (%)				0.542
No	20189 (99.4%)	501 (99.8%)	20690 (99.4%)	
Yes	117 (0.6%)	1 (0.2%)	118 (0.6%)	
Large Bowel Obstruction, n (%)				0.81 ²
No	20126 (99.1%)	497 (99.0%)	20623 (99.1%)	
Yes	180 (0.9%)	5 (1.0%)	185 (0.9%)	
lleus, n (%)				0.871
No	20079 (98.9%)	496 (98.8%)	20575 (98.9%)	
Yes	227 (1.1%)	6 (1.2%)	233 (1.1%)	
Constipation, n (%)				<.01 ¹
No	19629 (96.7%)	463 (92.2%)	20092 (96.6%)	
Yes	677 (3.3%)	39 (7.8%)	716 (3.4%)	
Nausea Vomiting, n (%)				0.73 ²
No	20224 (99.6%)	501 (99.8%)	20725 (99.6%)	
Yes	82 (0.4%)	1 (0.2%)	83 (0.4%)	
Post Op Nausea Vomiting, n (%)				0.861
No	19961 (98.3%)	494 (98,4%)	20455 (98.3%)	
Yes	345 (1.7%)	8 (1.6%)	353 (1.7%)	

Yes

¹Chi-Square p-value; ²Fisher Exact p-value;

#108 Inpatient Genetics Service and Testing Trends: A Retrospective Multi-Institution Analysis (2021-2024)

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Mentor: Lois J Starr

Program: Pediatrics - Medical Genetics

Type: Original Research

Background: Clinical genetics has been revolutionized by rapid improvements in testing. The Medical Genetics consult team serves five hospitals. Prior to 2019, prior authorizations limited genetic testing. In 2019, these restrictions were lifted for microarray and cytogenetic testing. By the end of 2022, most institutions approved our ordering of rapid exome sequencing for patients with insurance without a formal prior authorization. These changes and advancements improved the quality and timeliness of care for patients and reduced the burden of additional cost considerations for families.

Methods: Every inpatient consult performed since January 2021 was recorded with patient demographics, location, indication, recommendations, and results. Preliminary analysis assessed consult patterns, testing recommendations, and results. No IRB was utilized for this project.

Results: Preliminary review identified 1,177 genetic consults with 1,039 tests initiated. Neonatal intensive care units consistently accounted for 60-70% of consults each year. Only 1% involved adult patients. Diagnostic yield improved annually, with pathogenic results identified in 34%. Non-diagnostic results accounted for 43%, while variants of uncertain significance rates decreased from 37% in 2021 to 15% in 2024. The proportion of pathogenic diagnoses increased from 27% in 2021 to 38% in 2024.

Conclusion: Our findings underscore the critical role of inpatient genetic consultations in patient care. An increased diagnostic rate and reduction of uncertain results occurred since 2021, likely due to improved testing processes, availability of exome testing, and variant curation. Additional analyses will explore correlations between consult characteristics, test methodologies, and clinical outcomes. Our experience highlights the transformative potential of integrating advanced genetic diagnostics into inpatient care models and reinforces the importance of equitable access.

#109 Geo-Mapping as a Method for Prehospital Blood Management for Trauma Patients

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Mentor: Reynold Henry Program: General Surgery Type: Original Research

Background: Prehospital whole blood (PHWB) transfusion has been shown to improve outcomes and is becoming increasingly common for trauma patients. Whole blood is a scarce resource that must be stewarded appropriately. We propose municipalities utilize geo-mapping to determine their highest need zones and appropriately distribute high-cost resources such as whole blood.

Methods: A retrospective analysis was performed using prehospital trauma registry data from level 1 and 2 trauma centers in Nebraska. All trauma patients for whom massive transfusion protocol (MTP) was activated in the trauma bay were included. MTP activation served as a surrogate for patients who would benefit from PHWB. MTP incidence was mapped for Omaha and Lincoln. A χ 2 goodness of fit test compared MTP incidence by patient zip code with historical controls from traffic and crime incident databases

Results: A total of 338 MTP patients were included. Geo-mapping revealed a higher need for PHWB in lower social economic centers of both Omaha (Figure 1A) and Lincoln near their respective downtowns, where African American and Latinx populations are most concentrated. Goodness of fit demonstrated a $\chi 2 = 2167.05$ (p < 0.001) for Omaha (**Figure 1B**) and $\chi 2 = 121.53$ (p < 0.001) for Lincoln.

Conclusion: Geo-mapping of MTP data for Omaha and Lincoln demonstrated a strong correlation with historical controls, supporting the use of MTP activation as a surrogate for patients who would benefit from PHWB. This validates a novel and simple method for municipalities to plan for a prehospital blood program by using geo-mapping to ensure that scarce resources are distributed equitably and cost-effectively.

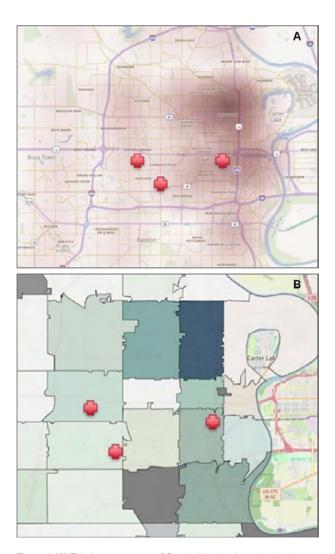


Figure 1 (A) This is our geo-map of Omaha blunt and penetrating trauma patients who had MTP activated in the trauma bay. Red crosses represent the trauma centers in Omaha from which our data was collected. (B) This is an Omaha zip code map with an overlay of historical control data from the Omaha police department crime incident database and the Nebraska Department of Transportation database. Darker shades of blue represent a stronger correlation between MTP incidence and MVC/assault incidence based on the goodness of fit test. Red crosses represent the trauma centers in Omaha from which our data was collected.

#110 A Rare Case: Dental Panoramic Radiograph Leads to the Diagnosis of a Large Internal Carotid Artery Aneurysm

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Mentor: Jason B. Untrauer

Program: Oral & Maxillofacial Surgery

Type: Case Report

Background: Extracranial internal carotid artery aneurysms are rare entities with an incidence of <1% of all arterial aneurysms. They are usually asymptomatic and found incidentally but can grow large enough to produce local mass effect symptoms, stroke-like symptoms, or rupture. Although previous studies have demonstrated 3-15% of panoramic radiographs (PRs) show evidence of carotid artery calcifications (CACs), usually below the angle of the mandible near the C3-C4 intervertebral junction (Figure 1A), we were unable to find any case reports of carotid artery aneurysms identified on PR. The following case report illustrates the important role that dentists may play in the identification and surgical management of carotid artery pathology.

Case: A 38-year-old male presented to his dentist complaining of dental pain. A panoramic radiograph was taken and found by his dentist to have left CACs. The patient was otherwise asymptomatic and denied any history of trauma or neck surgery. He was sent to the University of Nebraska Medical Center for further evaluation. Further work up by vascular surgery with computed tomography angiography (CTA) of the neck revealed a 3.9 cm mid-left internal carotid artery (ICA) aneurysm (Figure 1B). An extraoral vertical ramus osteotomy (EVRO) was performed by oral and maxillofacial surgery (OMFS) to assist vascular surgery with improved surgical exposure (Figure 1C-D). The ICCA (Figure 1E) was successfully resected and free of recurrence or symptoms on follow-up.

Conclusion: Panoramic radiographs can aid in the early diagnosis and intervention of ICA pathologies. This gives dentists an additional responsibility to carefully analyze this often-ignored area on PR.

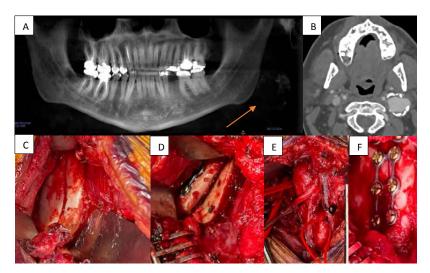


Figure 1. (A) Panorex showing CAC (B) CTA Neck showing left ICA aneurysm (C) Extraoral vertical ramus osteotomy (D) Anterior rotation of proximal mandibular segment aid in vascular access (E) ICA aneurysm, and (F) Fixation of osteotomy after vascular repair.

#111 Temporomandibular Joint Articular Eminence Anatomy as a Predictor of Anterior Disc Displacement on MRI

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Program: Oral & Maxillofacial Surgery

Type: Original Research

Background: The temporomandibular joint (TMJ) is a ginglymoarthrodial synovial joint supported by a complex system of muscles and ligaments and plays an important role in masticatory function and speech. Temporomandibular joint dysfunction (TMJD) affects between 5-12% of the population. TMJ anterior disc displacement (DD) is relatively common and is highly associated in patients with symptomatic TMJD. It has been suggested that articular eminence steepness and morphology may play a role in the development of DD, as it directly influences the condylar and articular disc path of movement. The aim of this study was to help clarify the role that articular eminence anatomy plays in the development of DD of the TMJ, which has future implications on surgical management of internal derangement of the TMJ.

Methods: This was a retrospective study approved by the institutional review board (UNMC IRB-0354-20-EP). TMJ MRIs of 129 Patients (253 joints) with symptomatic TMJD were reviewed and assessed for disc displacement and eminence characteristics. Statistical analysis was performed to investigate whether TMJ eminence morphology (classified into A- Box, B - Sigmoid, C- Flat, D-Deformed, **Figure 1**), eminence height, or inclination is related to DD. Fisher's exact test was used for comparisons of categorical variables with any disk displacement (left or right) at the patient level. P < 0.05 was considered statistically significant.

Results: There were no statistically significant associations between TMJ morphology, mean height, and inclination with TMJ anterior disc displacement.

Conclusion: In our study, TMJ eminence anatomy did not appear to have an association with the presence of DD. Additional studies are needed to determine the role of the eminence in the development of TMJD.

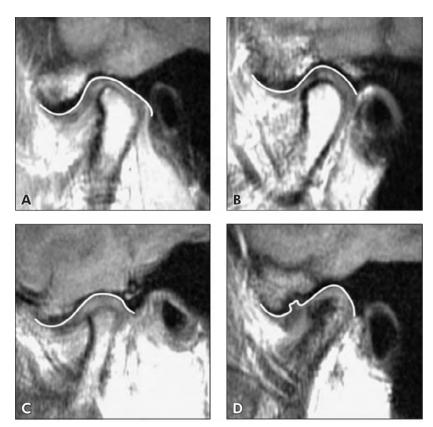


Figure 1. Eminence morphology, eminence height, and inclination were identified for this study. Four types of TMJ eminence morphology: **A**, Box-shaped; **B**, Sigmoid-shaped; **C**, Flat; **D**, Deformed.

#112 Accuracy of Predicted Angular Measurements Utilizing Virtual Surgical Planning in Bimaxillary Orthognathic Surgery for Treatment of Angle Class III Malocclusions

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Mentor: Jason Untrauer

Program: Oral & Maxillofacial Surgery

Type: Case Report

Background: Many studies have demonstrated the accuracy of virtual surgical planning (VSP) for orthognathic surgery. Although the literature supporting VSP accuracy is growing, there are still unknowns surrounding the accuracy of predicted angular changes. Several important angular measurements to address facial symmetry and esthetics include the incisor angle to the Frankfort horizontal plane (FHP), the occlusal plane angle, the mandibular plane angle, and maxillary yaw. Orthognathic surgery involves 3-dimensional changes, especially in patients with Angle class III malocclusions who often have some degree of facial asymmetry requiring yaw correction of the maxilla, therefore, accuracy should be assessed for both linear and angular measurements.

Case: An 18-year-old Asian female underwent orthognathic surgery utilizing VSP for correction of an Angle Class III skeletal. A postoperative Cone Beam Computed Tomography (CBCT) taken one week after surgery was compared to the preoperative surgical plan. Angular measurements (**Figure 1A-C**) were measured at various cephalometric landmarks and compared. The postoperative CBCT was superimposed with the preoperative surgical plan (**Figure 1D**). The deviation between the planned and actual linear measurements were within the acceptable range of 2.00 mm (**Figure 1E**). The difference between predicted versus actual for incisor angle was 0.83° (115.73° and 116.57°, respectively), 0.78° for occlusal plane angle (14.91° and 14.13°), 0.08° of change for mandibular plane angle (35.35° and 35.27°, and maxillary yaw change of 1.2° in a counter-clockwise direction (Figure 1E).

Conclusion: VSP was accurate for predicting surgical movements in both linear and angular dimensions for Skeletal Class III patients undergoing bimaxillary orthognathic surgery.

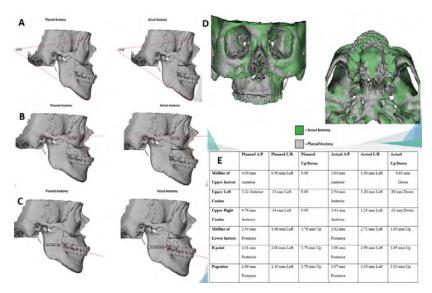


Figure 1. A, Predicted versus actual mandibular plane angle; B, Planned versus actual maxillary incisor angle; C, Planned versus actual occlusal plane angle; D, Superimposition demonstrating planned versus actually maxillary yaw; 1.2 degrees of difference; E, Planned Vs. actual linear movements following orthognathic surgery.

#113 Loss to Follow-Up in Patients Undergoing Thoracic Endovascular Aortic Repair for Trauma

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Mentor: Jason Cook

Program: Surgery – Vascular Surgery

Type: Original Research

Background: High rates of loss to follow-up are common in the trauma population. Patients with traumatic thoracic aortic injuries who have undergone thoracic endovascular aortic repair (TEVAR) require routine surveillance to monitor for endoleak and other long-term complications, and therefore represent a high-risk loss to follow-up cohort. The purpose of this study was to examine loss to follow-up after trauma TEVAR at our facility and to identify any factors contributing to failure to follow-up.

Methods: A retrospective review was conducted of all patients undergoing trauma TEVAR at a single Level 1 trauma center from January 2018 to October 2021. Electronic medical records were reviewed for CPT codes and demographic information. All patients who qualified for long-term follow-up per Vascular Quality Initiative (VQI) guidelines were included. Data analysis was performed using Microsoft Excel.

Results: A total of 17 trauma TEVARs were performed during the study period. One patient expired prior to hospital discharge. Of the 16 patients eligible for long-term follow-up, 5 (31%) were lost to follow-up. Age (p = 0.19), race (p = 0.81), gender (p = 0.29), insurance status (p = 0.69), and travel distance to the medical center (p = 0.69) were not significant contributors to loss to follow-up.

Conclusion: Roughly one-third of our trauma TEVAR patients are lost to follow-up. No statistically significant demographic factors were identified as contributing to loss to follow-up. Moving forward, we would like to complete retrospective telephone surveys with our trauma patients to further understand their barriers to follow-up and to provide additional patient education on the importance of close monitoring of their aortic endografts.

#114 High-Energy, High-Resource: Attempting to Predict 4th of July Hand Call Burden

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Mentor: Joseph Morgan

Program: Orthopaedic Surgery

Type: Original Research

Background: Blast-related upper extremity injuries sustained during the Independence Day holiday are time- and resource- intensive. The objective of this study was to evaluate incidence of blast-related injuries and system burden against weather and holiday timing.

Methods: Available records from 2017-2023 for patients treated by fellowshiptrained hand surgeons at a single tertiary institution for blast injuries sustained during the Independence Day holiday period (7 days preceding and following the holiday) were reviewed. This study is IRB exempt. Tourniquet time and return to operating room within holiday period were collected as proxies for system burden. The weather as documented by National Oceanic and Atmospheric Administration data and the day of the week on which Independence Day fell were recorded.

Results: Twenty-three blast-related injuries occurred during the defined period. Mean tourniquet time was 70.5 minutes and 10 of the injuries (43.5%) required 13 returns to the operating room within the period. Six of the injuries (26%) occurred each on Tuesday and Sunday while 10 (43.5%) total occurred Friday-Sunday. Fifteen (65.2%) injuries occurred on days with zero or trace precipitation; the maximum amount of precipitation on any day of injury was 0.86 inches. High temperatures ranged from 78-92 degrees Fahrenheit on day of injury.

Conclusion: The systematic burden of blast-related upper extremity injuries each year is likely influenced by multiple factors. Injuries in this study were almost evenly split between mid-week and weekend days; most injuries occurred on days without precipitation. Hand surgeons and hospital systems may be best served by optimizing resource flexibility.

#115 Initial Assessment of an Obstetrics and Gynecology Research Interest Group

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Mentor: Kristen Gerjevic

Program: Obstetrics & Gynecology

Type: Original Research

Background: Specialty-specific research interest groups (RIG) have been shown to increase research participation throughout physician careers and serve as a formal setting for mentorship, encouraging residents to act in a mentor/teacher role. The goal of this project is to evaluate the utilization and impact of an Obstetrics and Gynecology (OB/GYN) RIG after its first year of implementation and identify areas of improvement.

Methods: This cross-sectional survey queried medical students, residents, and faculty about the department RIG at Creighton University Department of Obstetrics and Gynecology. The survey examined training level, satisfaction, perceived accessibility of residents and faculty mentors, and interest in academic medicine. The institutional review board deemed the study exempt.

Results: A total of 26 responses were collected: 14 students, six residents, and five faculty members. Resident and medical student reasons for attendance included: research mentorship (70%, n = 14), understanding research topics (50%, n = 10), and discovering research opportunities (84.6%, n = 22). Ninety percent (n = 18) of residents and medical students reported attendings are more approachable. Sixty-five (n = 17) percent reported satisfaction with the RIG. Respondents desired better communication regarding ongoing projects and more faculty involvement. In total, 34.6% (n = 9) of respondents reported they are considering an academic career after attending the RIG.

Conclusion: RIGs are an important addition to clinical training to engage students, residents, and faculty, provide an avenue for mentorship, and foster interest in academic medicine. Results from this survey provide an understanding of the impact of a newly instituted RIG, and demonstrated areas for improvement, including providing updates on projects and expanding faculty involvement.

#116 A Case of Stage IIB Squamous Cell Carcinoma Arising in a Mature Cystic Teratoma of the Ovary

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Mentor: Jennifer Ducie

Program: Obstetrics & Gynecology

Type: Case Report

Background: Malignant transformation occurs in 0.2-2% of mature cystic teratomas of the ovary and comprises 2.9% of all malignant ovarian germ cell tumors.

Case: A 46-year-old presented for consultation for bilateral complex adnexal cysts. On exam, the uterus measured 6 cm, and a large, fixed pelvic mass occupied the posterior cul-de-sac. Transvaginal ultrasound revealed a uterus measuring 11.0 x 3.0 x 6.0 cm. Endometrial stripe measured 6.5mm. A large right adnexal mass present measured 17.0 x 12.1 x 13.4 cm. Left ovary contained a 4.7 x 4.0 x 4.9 cm complex cyst. CA-125, CA 19-9, CEA 2.1, and Inhibin A and B were normal. Diagnostic laparoscopy was converted to exploratory laparotomy, and she underwent total hysterectomy and bilateral salpingo-oophorectomy with staging due to an intraoperative frozen section consistent with squamous cell carcinoma (SCC) arising within a mature cystic teratoma. Final pathology demonstrated stage IIB SCC; perirectal biopsy with invasive SCC upstaged the cancer. Her postoperative course was benign, and the PET CT was negative for occult malignancy elsewhere. She was treated with carboplatin, paclitaxel, and bevacizumab, with the plan for maintenance therapy with bevacizumab

Conclusion: In patients >45yo with large teratomas, an intraoperative frozen section should be performed. Staging and optimal debulking with lymphadenectomy has been shown to improve survival in advanced stages. High concentrations of squamous-cell carcinoma antigen and CA-125 are associated with decreased 5-year survival rates. Adjuvant treatment with carboplatin, paclitaxel, and bevacizumab for advanced stage disease may improve survival, but adjuvant radiotherapy has not been shown to improve survival.

#117 Partial Response to Cervical Radiofrequency Ablation in Veteran With Severe Cervical Diffuse Idiopathic Skeletal Hyperostosis

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Mentor: Justin Choi

Program: Physical Medicine & Rehabilitation

Type: Case Report

Background: Cervical Diffuse Idiopathic Skeletal Hyperostosis (DISH) is characterized by enthesopathy of the spine and extremities. The etiology of the condition is unknown; however, bone formation distinctive from DISH results from abnormal osteoblastic differentiation and activity at the enthesis. Presentation includes pain and stiffness resulting in a physical exam that reveals decreased range of motion (ROM). Treatment includes physical therapy, medications, and lifestyle modification. Here we present a patient with severe cervical DISH causing axial neck pain who partially responded to radiofrequency ablation (RFA) of medial branch nerves in the cervical spine.

Case: The patient is a 62-year-old veteran with the past medical history of Type 2 Diabetes Mellitus, hypertension, hyperlipidemia, depression, right rotator cuff injury, and chronic neck/low back pain seen for chronic axial neck pain without radiation. On initial evaluation, he was found to have severely limited cervical active ROM in all directions. MRI C-spine revealed bridging anterior osteophytes at C2-T1, compatible with DISH. His pain was initially refractory to medications. We performed a cervical medial branch block right C3-C5 followed by RFA of the right C3-C5. The right-sided RFA produced a >50% reduction in pain relief for 11 months. A follow-up left-sided RFA C3-C5 and left-sided C7-T1 epidural steroid injection were not impactful.

Conclusion: RFA procedures may continue to be used for the mediation of face-togenic cervical pain secondary to DISH. Spinal fusions may not necessarily be a contraindication to RFA procedures so long that hardware does not impede visualization of desired targets.

#118 Pain From Cervical Radiculopathy Effectively Treated With Ultrasound-Guided Erector Spinae Plane Block In a Complex Patient

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Mentor: Redgy Fuller

Program: Physical Medicine & Rehabilitation

Type: Case Report

Background: The present case highlights the potential effectiveness of an erector spinae plane block for the treatment of cervical radiculopathy in a medically complex patient.

Case: We describe the case of a male patient in his thirties with known cerebral palsy, nonverbal status, and left-sided spasticity who was referred to pain management by his primary care physician for right-sided neck pain radiating down the posterior lateral right arm for six months. Unfortunately, the patient had chronic hemiballistic movements throughout his left side, necessitating sedation to obtain an MRI. This revealed high grade neuroforaminal stenosis at the right cervical 5-6 and 6-7 levels. As the risks of an interlaminar epidural steroid injection outweighed the benefits, it was decided to pursue an erector spinae plane block with saline and dexamethasone under ultrasound guidance, anticipating diffusion of the solution towards the affected nerve roots. The patient tolerated the procedure well, and in follow up two weeks later, he reported significant improvement in pain and no longer needing to use his oxycodone prescription at this appointment. The pain relief lasted several months before he returned to have the procedure repeated.

Conclusion: This case highlights an alternative method of epidural analgesia in a patient with comorbidities that render traditional approaches for cervical epidural injection less favorable. High volume erector spinae injections have been shown to have variable spread that often reaches the epidural space and neural foramen. An ultrasound-guided high volume erector spinae injection using dexamethasone may be a safe and efficacious alternative to interlaminar epidural steroids.

#119 Sinking Skin Flap Syndrome in a Patient With a Traumatic Brain Injury

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Nebraska Medical Center, Omaha, NE

Mentor: Christopher Anderson

Program: Physical Medicine & Rehabilitation

Type: Case Report

Background: Sinking skin flap syndrome is a complication after a large craniectomy with sunken skin above the bone defect with neurological symptoms.

Case: The patient was the pedestrian in a pedestrian vs pick-up accident. CT head showed multi-compartmental intracranial hemorrhage, including likely right transverse sinus injury, right parietal epidural hematoma, and diffuse bifrontal and right temporal contusion with multiple calvaria fractures. She was noted to have a 2 millimeter, right to left midline shift. CT cerebral venography also showed a dural sinus injury. Five days after the initial injury, she was taken for an emergent craniectomy. She was discharged to LTACH 24 days after surgery. However, she was discharged back to the acute hospital one day after admission due to purulent discharge from her wound and wound dehiscence due to an infected bone flap, which was subsequently removed. During her return to LTACH stay, she had a repeat head CT due to decreased ability to follow commands and decreased attention, requiring more cues for participation in therapies, particularly with upright positioning. Additionally, she experienced the onset of cervical dystonia. CT showed progressive inward concavity at the right craniectomy flap with associated progressed midline shift to the left consistent with Sinking Skin Flap Syndrome (Figure 1). She ultimately underwent cranioplasty via 3D printing skull flap.

Conclusion: Sunken Skin Flap Syndrome should be a complication considered in patients with large craniotomies experiencing a decline in mental status, worsening headaches, new or worsening focal deficits, or new-onset seizures.

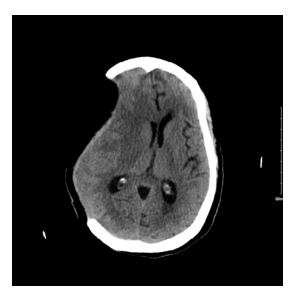


Figure 1. Sinking flap syndrome with associated right to left midline shift in the CT head.

#120 Occult Presentation of Spinal Epidural Abscess

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⁴Department of Internal Medicine, College of Medicine, University of Nebraska Medical Center, Omaha, NE, USA

Mentor: Brett Begley

Program: Physical Medicine & Rehabilitation

Type: Case Report

Background: Spinal epidural abscesses (SEA) commonly arise from hematogenous dissemination, typically occurring from direct extension from adjacent tissue or inoculation from procedures involving the spinal canal. SEA are uncommon, with a reported incidence of 5.1 out of 10,000 admissions, but the nonspecific syndrome of back pain, fever, and neurological deficit may not always be present, leading to failure of early detection and treatment of SEA

Case: An 87-year-old man with a history of chronic back pain presented to the emergency department with acute worsening of back pain for two weeks. He denied acute trauma, but he underwent cystoscopy three weeks prior with an isolated fever the following day. Pyuria was detected at presentation, and subsequent culture grew Streptococcus, treated with cephalexin. He re-presented the following week for worsened back pain without neurological deficits or lab abnormalities aside from c-reactive protein of 20 mg/dL. CT spine showed degenerative changes, and he was discharged with oxycodone and a neurosurgery referral. One week later, he presented with unresolving pain and weakness with an elevated erythrocyte sedimentation rate (138 mm/hr). Admission MRI demonstrated left psoas myositis with abscess and L4-L5 discitis/osteomyelitis with epidural abscess. Serum testing was unremarkable. Infectious disease and orthopedics consults recommended biopsy of the psoas abscess, which grew Streptococcus gallolyticus pasteuranius. He was discharged with ceftriaxone for six weeks.

Conclusion: Spinal epidural abscess is a rare condition requiring prompt diagnosis and treatment to prevent complications, especially sepsis. Commonly, it presents with localized pain with radiculopathy, and treatment typically includes 6 weeks of antibiotics with possible surgical intervention if there is neurological involvement.

#121 Cabergoline and Impulse Control Disorders: Screening Patients With Pituitary Adenomas in an Endocrinology Clinic

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Mentor: Andjela Drincic Program: Psychiatry Type: Original Research

Background: Cabergoline, a dopamine agonist used to treat prolactinoma, can cause impulse control disorders (ICDs). This study examined risk factors for ICD development and the effectiveness of standard screening practices.

Methods: IRB approval was obtained, and electronic medical records were reviewed for patients diagnosed with "Benign neoplasm of the pituitary gland (D35.2*)" and prescribed cabergoline. Records were screened for ICD risk factors, development, and whether ICD screening or discussions occurred at initial and follow-up endocrinology visits.

Results: Among 282 patients, 14 (5%) developed clinically significant ICDs. The median age was 43, with 43% female and 57% male. ICDs were more common in males (86% vs. 41%, p = 0.001). ICDs were associated with higher cabergoline doses (median 1.5 mg vs. 1 mg, p = 0.01) but not race (p = 0.17), ethnicity (p = 1.00), smoking (p = 0.77), testosterone therapy (p = 0.80), psychiatric diagnoses (p = 0.37), or psychotropic medication use (p = 0.48). Screening was performed in only 26.6% of first visits, with a significant association between screening and ICD development (p < 0.0001); 93% of ICD patients were screened vs. 17% of non-ICD patients.

Conclusion: Male sex and higher cabergoline doses were risk factors for ICDs, aligning with prior research, while testosterone therapy and smoking were not. Psychiatric diagnoses and psychotropic medication use did not increase ICD risk, addressing a gap in the literature. Inadequate screening likely contributed to the low prevalence observed.

#122 Sustained Positive Buprenorphine After Long-Acting Injectables and Transition to Naltrexone With a Novel Micro-Dosing Approach in Treating Opioid Use Disorder: A Case Report

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Mentor: Kenneth Zoucha

Program: Psychiatry – Addiction Medicine

Type: Case Report

Background: Oral buprenorphine-naloxone was approved for opioid use disorder (OUD) treatment in 2002 for patients over 16. A monthly long-acting injectable (LAI) form was approved in 2017, using the Atrigel Delivery System for slow release. LAI Buprenorphine can remain detectable in blood and urine for 6-12 months, creating challenges when transitioning to opioid antagonists like naltrexone.

Case: An 18-year-old female with OUD was weaned off LAI buprenorphine after two years of remission. Six months later, she overdosed on hydrocodone, was resuscitated with fluids, and initially tested negative for buprenorphine on a urine drug screen (UDS). Nine days later, after starting oral naltrexone (25 mg), she developed severe withdrawal symptoms, and repeat UDS tests were positive for buprenorphine. She denied recent buprenorphine use, and further investigation revealed that the initial urine sample had a specific gravity < 1.010, likely due to urine dilution from fluid resuscitation. A novel micro-dosing regimen with compounded naltrexone (starting at 2 mg, increasing to 20 mg) was used, followed by a transition to traditional naltrexone (50 mg daily). The patient tolerated this approach with minimal withdrawal symptoms and was eventually switched to LAI naltrexone.

Conclusion: This case highlights the challenges of managing OUD with buprenorphine, particularly LAI forms that can remain in the system for up to 12 months. It also emphasizes the complexity of interpreting UDS, as aggressive fluid resuscitation can dilute urine, leading to false negatives. The micro-dosing regimen with compounded naltrexone allowed for smoother initiation of treatment with minimal withdrawal symptoms.

#123 Exercise Interventions and Physical Activity in Adult Blood Cancer Survivors: A Scoping Review

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Mentor: Vijaya R. Bhatt

Program: Internal Medicine – Oncology & Hematology

Type: Review

Background: Cancer survivors often experience physical and psychological challenges, such as pain, fatigue, sleep disturbances, and depression, which impair their quality of life. While exercise interventions have proven beneficial for survivors of solid tumors, research on their impact on blood cancer survivors remains limited. This review examines the current evidence of the impact of exercise interventions in patients with hematologic malignancies, with a focus on interventions used, study participants characteristics, reported outcomes, and limitations.

Methods: The literature search included research articles that met the following criteria: included adults aged 18 years or older, who currently have or previously had a hematologic malignancy, where an exercise intervention was being implemented and were published in English from data inception until March 15th,2024.

Results: Eighteen studies were found, feasibility studies (n=10), randomized controlled trials (n=7), and a randomized parallel trial (n=1). Participants were predominantly younger adults and mostly white. The most common intervention was combined aerobic and resistance exercises (n=10), typically delivered three times per week over 8-12 weeks. Intensity was mainly monitored through heart rate devices. Feasibility studies demonstrated adherence rates of 66-87% and retention rates of 70-95%, with improvements reported in fatigue, quality of life, physical function, and cardiorespiratory fitness. Randomized trials reported similar benefits but showed mixed results regarding fatigue, quality of life, and physical fitness.

Conclusion: This review highlights the potential of exercise interventions to improve outcomes in hematologic malignancy patients. However, larger, diverse studies are needed to address long-term effectiveness, psychological impacts, cost-efficiency, and barriers to implementation.

#124 A Rare Case of Human Herpes Virus-8 Associated Multicentric Castleman Disease With Kaposi Sarcoma in an Immunocompetent Patient

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Mentor: Christopher D'Angelo

Program: Internal Medicine - Oncology & Hematology

Type: Case report

Background: Castleman disease (CD) is a rare lymphoproliferative disorder that can be classified into unicentric and multicentric forms. Multicentric Castleman disease (MCD) is characterized by systemic manifestations, including generalized lymphadenopathy, hepatosplenomegaly, polyclonal hypergammaglobulinemia, hematological abnormalities, and constitutional symptoms. MCD is often associated with Human Herpesvirus 8 (HHV-8), particularly in immunocompromised individuals, such as those with HIV/AIDS. This case report presents a patient diagnosed with HHV-8-associated MCD and Kaposi Sarcoma(KS) in an immunocompetent individual.

Case: A 57-year-old male with a history of hypertension, type 2 diabetes, and hyperlipidemia presented to our center after a gradual health decline over five months. His symptoms began while on a trip to Mexico and started as a persistent cough and fatigue that progressively worsened to increased fatigue, weakness, chills, and night sweats. Evaluations at outside hospitals revealed lymphadenopathy and a core biopsy showed reactive lymphoid hyperplasia without malignancy. Workup at our center showed anemia, thrombocytopenia, hypoalbuminemia, generalized lymphadenopathy, and splenomegaly. Lymph node excision biopsy confirmed Kaposi Sarcoma and HHV8-associated MCD (Figure 1). He met criteria for hemophagocytic lymphohistiocytosis and was given dexamethasone followed by doxorubicin and rituximab for HHV-8 associated MCD with KS. He continued to deteriorate despite treatment and died.

Conclusion: This case highlights the challenges in the diagnosis of MCD associated with HHV-8 and Kaposi Sarcoma, as it can present similarly to infectious and malignant conditions and stresses the importance of early diagnosis and multidisciplinary management. Clinicians should have a high index of suspicion for MCD in patients presenting with unexplained lymphadenopathy and systemic symptoms.

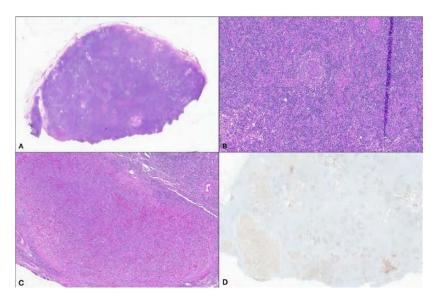


Figure 1. Lymph node Excisional Biopsy. **A)** The low-power view shows partially reserved lymph node architecture but with many vaguely nodular pale areas. **B)** A higher power shows involuted/atretic germinal centers with onion-skinning and lollipop appearance created by vessels penetrating through the atretic germinal centers, which are consistent with Castleman-like changes. **C)** The pale areas at higher power are composed of bland spindle cell vascular proliferation with red blood cell extravasation. **D)** HHV8 stain is positive in scattered areas in the lymph node. The constellation of findings is consistent with HHV8-associated Castleman Disease and Kaposi Sarcoma by histology.

#125 Appropriate DVT Prophylaxis Usage Among Patients Admitted to Meyer Academic Teams

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Mentor: Carrie Valenta

Program: Internal Medicine

Type: Original Research

Background: Hospitalized patients can be at higher risk for deep vein thrombosis (DVT), though this risk varies. At the University of Nebraska Medical Center, most patients admitted to Internal Medicine teaching teams (referred to as Meyer teams) receive DVT chemoprophylaxis during their admission, regardless of functional status or risk, potentially increasing adverse events like medication reactions, bleeding, and decreased patient satisfaction. There are several risk assessment models for predicting DVT risk. UNMC uses the Caprini score within the electronic medical record (EMR) to assess hospital-associated DVT risk. Though it was only validated for surgical patients, it is commonly applied to non-surgical patients as well.

Methods: A retrospective chart review analyzed patients ≥19 years old admitted to Meyer teams and discharged between January 1 and June 30, 2024. Patients were stratified by EMR-calculated Caprini scores into high (Caprini ≥3) or low (Caprini 0-2 with <2-day stay) DVT risk. Patients on therapeutic anticoagulation were excluded.

Results: Of 1,987 patients, 1,743 were high risk, and 244 were low risk; 131 low-risk patients received DVT prophylaxis.

Conclusion: Currently, Meyer teams prescribe DVT prophylaxis to low-risk patients. EMR-calculated DVT risk is not prominently displayed in order sets but is accessible through the VTECAPRINIRISK smart phrase. To address this, educational information sheets and an algorithm for DVT prophylaxis decision-making (Figure 1) were distributed to Meyer teams. Repeat data collection is planned to evaluate the impact on DVT prophylaxis prescribing. Future improvements could focus on integrating EMR-calculated DVT risk scores directly into EMR order sets for enhanced point of care decision support.

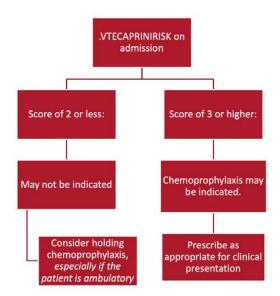


Figure 1. Decision support algorithm for DVT prophylaxis prescribing while admitting patients to Meyer Internal Medicine teams.

#126 Multisystem Inflammatory Syndrome in Adults (MIS-A) Leading to Shock in a Previously Healthy Male

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Program: Internal Medicine

Type: Case Report

Background: Multisystem Inflammatory Syndrome (MIS) has been reported in both children (MIS-C) and adults (MIS-A) following COVID-19 infection, with MIS-C being more common and better characterized. We present a case of MIS-A in a previously healthy male in his twenties.

Case: The patient presented with five days of nausea, vomiting, diarrhea, and subjective fevers. His family had confirmed COVID-19 infections two weeks prior to presentation. He was febrile with a temperature of 39°C and developed progressive hypotension requiring vasopressor support. Initial computed tomography (CT) chest/abdomen/pelvis suggested possible enterocolitis, with no chest abnormalities. He developed a scattered erythematous rash, bilateral conjunctivitis, acute kidney injury, and thrombocytopenia. Echocardiogram demonstrated a left ventricular ejection fraction (LVEF) of 25–30% with global hypokinesis. Broad infectious workup, including bronchoalveolar lavage and a gastrointestinal pathogen panel, was negative. Repeat chest CT revealed a small right upper lobe pulmonary embolism without hemodynamic significance or right heart strain. He improved with high-dose steroids and diuresis. Vasopressors were discontinued, and he was successfully extubated. A cardiac magnetic resonance imaging at discharge demonstrated LVEF recovery to 55%.

Conclusion: Given the negative infectious workup and the improvement with steroids, MIS-A secondary to recent COVID-19 infection was suspected. Primary diagnostic criteria include fever with new-onset cardiac dysfunction, conjunctivitis, and rash. MIS should be considered in patients with recent COVID-19 infection and otherwise unexplained decompensation. Unlike MIS-C, MIS-A lacks specific treatment guidelines. The National Institutes of Health supports extrapolation of pediatric therapies to adults, commonly high-dose glucocorticoids. The patient was discharged on a 15-day prednisone taper without symptom recurrence.

#127 Characteristics of Anxiety and Stress-Triggered Inducible Laryngeal Obstruction

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Mentor: Jennilee Luedders **Program:** Internal Medicine

Type: Original Research

Background: A range of triggers are associated with inducible laryngeal obstruction (ILO), including exercise, inhaled irritants, infections, and anxiety or emotional stress. These may drive disease independently or in combination. The purpose of this study is to investigate characteristics of those with vs. without anxiety/stressinduced ILO.

Methods: Subjects age >12 years referred for ILO assessment at the time of provocation challenge-rhinolaryngoscopy were eligible for this ongoing. IRB-approved registry. An investigator-designed questionnaire was administered with corresponding electronic medical record data collection. Chi-square tests and Student's t-test were utilized for statistical assessments

Results: Of 70 subjects, 54% (N = 38) reported anxiety/stress as a trigger for ILO. This group had higher prevalence of generalized anxiety (61% vs 31%, p = 0.01) and history of domestic violence (37% vs 16%, p = 0.047) compared to those without anxiety/stress as a trigger. The anxiety/stress-induced ILO group reported more dyspnea at rest (76% vs 44%, p = 0.005) and throat tightness (74% vs 50%, p =0.04) than those without anxiety/stress as a trigger. In contrast, those with anxiety/ stress-induced ILO reported less post-nasal drip than those without anxiety/stressinduced ILO (76% vs 94%, p = 0.046). There were no differences between groups with respect to age, sex, race, BMI, smoking status, asthma history, or other reported ILO symptoms and triggers.

Conclusion: Anxiety and stress play an important role in ILO symptoms in the majority, but not all, of ILO subjects. Detailed assessments are necessary to phenotype subpopulations of ILO to tailor therapy and develop new approaches to disease management. Clinical awareness and treatment of underlying anxiety remains a critical component in the management of ILO.

#128 Facilitating Living Kidney Donation: Retrospective Evaluation of Weight Loss Interventions to Support Kidney Donation

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Mentor: Roslyn B. Mannon **Program:** Internal Medicine

Type: Original Research

Background: Living donor kidney transplantation provides excellent outcomes of graft function and survival for those with kidney failure. Donation of a kidney entails thorough medical and psychosocial evaluations. Obesity is an increasingly prevalent medical condition and known risk factor for the development of chronic kidney disease post-donation. Accepting overweight and obese individuals as donors remains controversial. We evaluated the impact of obesity on living donation in the Nebraska Medicine kidney transplant program. Our long-term goal was to define best practices for assessing donor suitability and donor health.

Methods: We performed an IRB-approved retrospective chart review of living kidney donors evaluated from January 1, 2019-June 23, 2024 (n = 375). Data collected included donor demographics, lab testing, body mass index (BMI), and weight loss interventions for those identified as overweight (BMI ≥30) or obese $(BMI \ge 32)$.

Results: A total of 375 individuals were invited for in-person evaluation; 155 (41.3%) were declined for donation. Key reasons for declination included medical co-morbidities (n = 73; 47%), psychosocial factors, (n = 14; 9.2%), and BMI (n = 22; 14%) as either primary or secondary reason (Figure 1). Of the 22 obese individuals, nearly all (n=20) had consultation with our dietician. Interventions are shown in Figure 1.

Conclusion: Candidacy for living kidney donation is in part dependent on BMI, but often other factors co-exist. Weight loss interventions included primarily dietician consultation, as well as diet and exercise. Use of glucagon-like peptide-1 agonist was infrequent, likely related to the time-frame of the study. These results should inform protocolized management of living donor candidates with obesity.

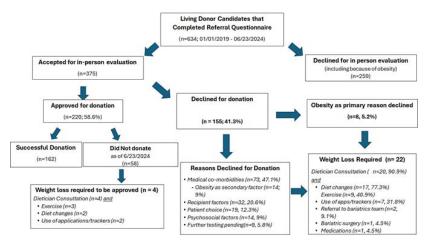


Figure 1. Study cohort of living donor candidates.

#129 4 Weeks of Dyspnea in Immunocompromised Woman: Presenting Symptom of Disseminated *Histoplasma Capsulatum*

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Mentor: Jennifer M. Davis

Program: Internal Medicine - Infectious Diseases

Type: Case Report

Background: Histoplasmosis is a dimorphic fungus that often presents with symptoms of community-acquired pneumonia. Immunocompromised patients can also present with disseminated disease involving other organ systems.

Case: A 25-year-old female with a past medical history of papillary thyroid carcinoma status post-surgical resection, dermatomyositis (managed with mycophenolate and monthly IVIG) presented to the emergency department with progressive shortness of breath associated with fevers, night sweats, and malaise. She had a new 2L oxygen requirement. Laboratory evaluation demonstrated pancytopenia (WBC 3,500, hemoglobin 9.7, platelets 129,000) and elevated liver function tests (AST 106 U/L, ALT 199 U/L, alkaline phosphatase 107 U/L). Chest CT chest and abdomen demonstrated diffuse submillimeter pulmonary nodules, a 1.6 cm pulmonary nodule, and splenomegaly. Serum 1,3 Beta D glucan returned elevated >500 pg/mL. The bronchoalveolar lavage (BAL) specimen showed fungal elements (Figure 1). Aspergillus galactomannan was elevated at 7.91. Histoplasma antigen returned positive from BAL (>25 ng/mL), serum (>25.0 ng/mL), and urine (>25 ng/mL). The patient received 6 days of intravenous liposomal amphotericin and was transitioned to oral itraconazole to complete 12 months of therapy for disseminated histoplasmosis.

Conclusion: Patients with immunocompromising conditions are at increased risk for the development of disseminated histoplasmosis, and it is often difficult to assess the degree of a patient's immunocompromise. The adrenal glands, liver, spleen, and bone marrow are often affected by disseminated disease. Diagnosis of Histoplasma capsulatum is often made by glycoprotein antigen testing, which has better sensitivity and specificity compared to culture. Providers should be aware of cross reactivity between aspergillus galactomannan, histoplasmosis antigens, and blastomycosis antigens.

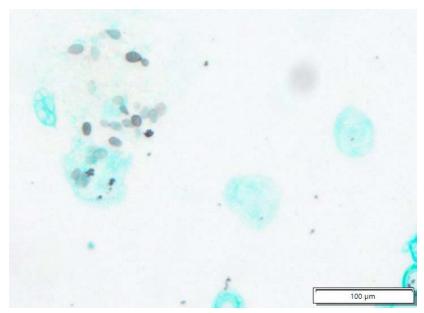


Figure 1. Bronchoalveolar lavage cytology with fungal yeast forms identified, consistent with Histoplasma.

#130 Midtown Clinic Buprenorphine Quality Improvement Project

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Mentor: Claudia Moore

Program: Internal Medicine

Type: Original Research

Background: There is a well-known need for medication for addiction treatment (hereafter referred to as MfAT), specifically for opioid use disorder via opioid agonist therapy (hereafter referred to as OAT). Reports from local MfAT-prescribing physicians (namely, those in Nebraska Medicine's addiction medicine division) indicate an opportunity for Midtown Clinic (MTC) to adopt stable/chronic patients on the medication buprenorphine, which also creates an opportunity to establish further primary care. Patients would be stabilized by addiction specialists and then handed off to MTC both for MfAT and other chronic and preventative cares. The goal of this is trifold: to open access to new patients seeking addiction cares, to increase educational opportunities for residents to learn management of a unique patient population, and to promote the health of this population in realms beyond just their substance use disorder.

Methods: In order to facilitate the above, the aforementioned quality improvement (QI) team worked to:

- 1. Create training modules to educate providers on MfAT with Buprenorphine.
- Create institutional policies and physician guidance for MfAT in the Midtown Clinic.
- Create a succinct/streamlined electronic medical record (EPIC) note template to document these encounters.

Results:

- 1. Protocol, training modules, and note template were successfully created.
- 2. We are currently planning on transferring patients via warm handoff to the midtown clinic.

Conclusion: Our goal with a poster presentation in the GME symposium is to display our methods/the tools created, the workflow of policy creation and implementation, and to help spread the word to these cares to help encourage other providers to be open-minded about MfAT and the general clinical utility of Buprenorphine therapy.

#131 Giant Cell Myocarditis in the Setting of Ischemic Cardiomyopathy

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Mentor: Scott Lundgren Program: Internal Medicine

Type: Case Report

Background: Giant cell myocarditis is a rare case of myocarditis that can be disguised as other cardiovascular conditions, such as acute heart failure.

Case: A 68-year-old male presented with four days of intractable vomiting, and chest pain found to be in monomorphic ventricular tachycardia, requiring direct current cardioversion. Labs were notable for elevated brain natriuretic peptide and negative troponin. Transthoracic echocardiogram showed depressed left ventricular function with inferolateral wall hypokinesis. He underwent left heart catheterization that showed chronic 70% left anterior descending artery and 50% right posterolateral coronary artery stenosis. He continued to deteriorate and developed cardiogenic shock, requiring Impella 5.5 placement. However, the patient continued to have poor perfusion, was unable to wean off Impella, and ultimately transferred to our institution for advanced therapy evaluation. We suspected acute myocarditis on presentation and emergently performed an endomyocardial biopsy, which revealed giant cell myocarditis (Figure 1). Despite initiating immunosuppressive therapy, he remained dependent on Impella and inotropes. He was ultimately listed as United Network for Organ Sharing status 2 and underwent successful orthotopic heart transplantation.

Conclusion: Giant cell myocarditis is a rare and often rapidly progressive condition that is difficult to diagnose due to its overlapping presentation with other cardiovascular conditions. It is usually evident by acute heart failure, cardiogenic shock, and ventricular arrhythmias. Any patient with a new onset of rapidly progressive acute decompensated heart failure and cardiogenic shock despite aggressive medical treatment should be considered for further workup for giant cell myocarditis to avoid delay in treatment.

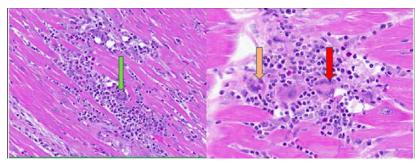


Figure 1. Giant Cell myocarditis with lymphocytes (green arrow), histocytes (orange arrow) and several giant cell (red arrow).

#132 Presentation and Management of Pinch-off Syndrome: A Rare **Complication of Subclavian Venous Catheters**

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Mentor: Lei Yu

Program: Interventional Radiology

Type: Case Report

Background: Pinch-off syndrome (POS) is a rare complication associated with subclavian central venous catheter (CVC) placement. It occurs when the catheter is repetitively compressed between the clavicle and first rib, causing transient catheter occlusion, catheter fracture, or migration of fractured fragment (Figure 1 A-B). Patients may present with catheter dysfunction, pain with flushing, dyspnea, or sometimes cardiac arrhythmia. Thus, this condition should be recognized and treated promptly. We present two cases of POS to illustrate the presentation, diagnostic imaging, and management.

Case: Patient one is a 23-year-old male presenting with malfunction of tunneled Broviac catheter. The catheter was placed surgically through a right subclavian approach one year prior. Fluoroscopy showed a fractured catheter at the venotomy site with distal fragment in the left pulmonary artery. After removing the remaining tunneled catheter from the chest, the migrated fragment was snared from the left pulmonary artery. A new right internal jugular catheter was placed. Patient two is an 83-year-old with a subclavian port placed three years prior presenting with malfunction. After injecting the port with contrast, extravasation was noted near the venotomy site (Figure 1C), confirming catheter tear (Figure 1D). The port was removed, and a tear at the proximal catheter was visualized upon examination.

Conclusion: These cases highlight the rare complications of subclavian CVC. When POS is suspected, appropriate imaging studies can be used to confirm the diagnosis. The damaged catheter should be promptly removed to avoid serious complications like catheter fracture and fragment migration.

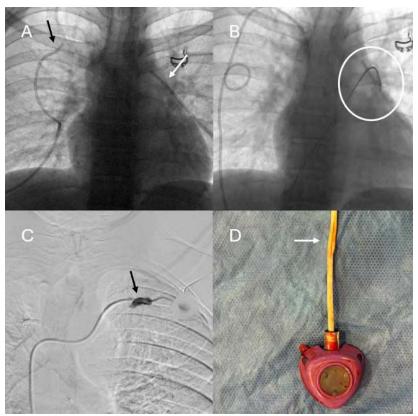


Figure 1. (A) CVC fractured at subclavian venotomy site (black arrow) with fractured fragment migrating to left pulmonary artery (white arrow); (B) Endovascular snare caught the catheter fragment (white arrow) which was later removed; (C & D) Contrast extravasation during port injection (black arrow) indicates a tear in the catheter (white arrow).

#133 Technical Quality of CTA Chest Pulmonary Embolism Protocol: Can we do Better?

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Mentor: John Haas

Program: Diagnostic Radiology

Type: Original Research

Background: The ability to diagnose a pulmonary embolism is paramount to quality patient care. Like other tertiary hospitals, we struggle with optimal pulmonary embolism (PE) Protocol Chest CT image quality, more often after hours and on weekends. Various suboptimal technical acquisition parameters are the most common reasons for poor imaging. Our goal was to improve PE CT image quality through a multidisciplinary quality improvement project while maintaining a low radiation dose.

Methods: A short illustrative PowerPoint explaining the importance of proper technique was distributed to all CT techs. Reminder signs were placed near the CT scanners. Technologists were called at the start of their shifts to remind them of the project. Fifty five CT PE studies from one month immediately preceding the interventions and 55 CT PE studies after the interventions were analyzed. Data points recorded include arm position, radiation dose, pulmonary trunk ROI, and equivocation phrases in the report. Two board-certified radiologists independently reviewed the images for quality and assigned a Likert score ranging from 1 to 5.

Results: Statistically significant improvements were noted after our interventions. Ideal arm positioning increased from 65% to 85%. Scan quality ratings increased by 0.47 units on average from pre- to post-intervention (p = 0.017). The average Likert scores increased for both readers post-intervention. There was a statistically significant decrease in average radiation dose from 1148 DLP to 877 DLP (p = 0.003).

Conclusion: Our interventions were effective at increasing imaging quality as well as reducing radiation dose. These interventions do not have substantial costs or barriers to achieving and can be implemented almost universally.

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