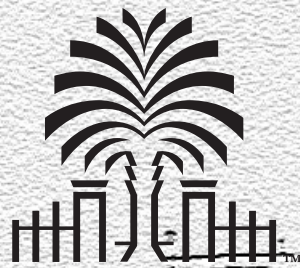


# **7th Annual Student Research Symposium**



UNIVERSITY OF  
**South Carolina**

**School of Medicine Greenville**

**12:30 PM - 5:45 PM**

**Zen  
924 South Main Street  
Greenville, SC 29601**

# SYMPOSIUM SCHEDULE

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**Lunch and Opening Remarks** ..... 12:30 PM – 1:00 PM  
Studio

Phyllis MacGilvray, MD, FAAFP, Dip ABLM  
Dean  
*University of South Carolina School of Medicine Greenville*

Alain H. Litwin, MD  
Chief Scientific Officer  
*Prisma Health*  
Professor of Medicine  
*University of South Carolina School of Medicine Greenville*

Sudha Garimella, MD  
Interim Associate Dean for Research  
Associate Professor  
*University of South Carolina School of Medicine Greenville*  
Medical Director, Division of Pediatric Nephrology and Hypertension  
*Prisma Health*

**Poster Session 1** ..... 1:00 PM – 2:00 PM  
Lounge

**Oral Presentations** ..... 2:15 PM – 3:45 PM  
Studio

**Afternoon Break** ..... 3:45 PM – 4:00 PM

**Poster Session 2** ..... 4:00 PM – 5:00 PM  
Lounge

**Awards and Closing Ceremony** ..... 5:00 PM – 5:45 PM  
Studio

**Adjournment**

# ORAL PRESENTATION SCHEDULE

**2:15 PM - 3:45 PM | Studio**

**Meaghan Arnold - Abstract #97**

The Impact of the Molecular Characterization Initiative on Care of Pediatric, Adolescent, and Young Adult Cancer Patients

**Amariyah Ayee - Abstract #91**

Stability in Vulnerability: Longitudinal Assessment of Material Need Insecurity in Patients with Cardiovascular Disease and HIV

**Mya Beasley - Abstract #49**

Imaging Modalities for Preoperative Location of Parathyroid Adenomas: Increasing Efficiency

**Molly Crowell - Abstract #45**

Good Vibes, Healthy Lives: A Community-Based Lifestyle Medicine Curriculum for School-Aged Children

**Evelyn Farah - Abstract #19**

CircRNA Profiles Reveal Race Specific Biomarkers in African American Breast Cancer Patients

**Cooper Kuess - Abstract #96**

The Effect of Social Drivers of Health on HgbA1c Reduction in the Wellness and Empowerment for Women Program at Prisma Health in Greenville, South Carolina

**Danny Pharm - Abstract #70**

Patients with Higher Preoperative ASES Scores have a Lower Chance of Achieving Successful Outcomes After Arthroscopic Rotator Cuff Repair

**Shrika Ravichandran - Abstract #78**

Promoting Growth While Avoiding Hyperglycemia in Neonates: an algorithm approach

**Abigail Rohr - Abstract #52**

In Vitro Characterization of Glioblastoma Inflammatory Signatures: Insights into Resistance and Model Selection

**Yash Verma - Abstract #107**

Gene Expression Profiles of Human Macrophages Reveal Insights into Pathogenesis of Necrotizing Fasciitis-associated *Acinetobacter baumannii*

# Andrew Abdelnour

Session 1  
Abstract 20



## Authors

Shivani Desai, MDa, Andrew Abdelnour, BSNb, Braelyn Webb, Ellaree Estesc, Dawn Blackhurst, DrPHa, John Scott, MDa,b

## Affiliations

Prisma Health Bariatric Surgery

## Mentor

John David Scott, MD FACS FASMBS



## Comparative Effectiveness of Two- Versus Four-Week Preoperative Liquid Diets on Postoperative Weight Loss in Bariatric Surgery Patients: A Retrospective Cohort Study

### Background/Purpose

Preoperative liquid diets are a common implementation prior to bariatric surgery to optimize surgical outcomes. However, the optimal duration of diets remains unclear. This study compares the effects of a two-week versus a four-week Optifast-based preoperative liquid diet on postoperative weight loss outcomes.

### Methods

A retrospective analysis was conducted using electronic medical records of 576 patients who underwent bariatric surgery. Of these, 512 had complete one-year postoperative weight data. Patients were categorized by preoperative diet duration (2-week vs. 4-week) and received nutritional counseling at each visit. Baseline characteristics, intraoperative details, and weight outcomes were analyzed using chi-square tests, t-tests, and multivariable linear regression modeling. Total body weight loss (TBWL%) at one year served as the primary outcome.

### Results

Patients in the 4-week group lost significantly more weight during the liquid diet phase (-3.8% vs. -2.5%,  $p < 0.001$ ) and had a lower BMI prior to surgery ( $p = 0.001$ ). However, TBWL% at 30 days and at 1 year did not significantly differ between groups. Mean TBWL% at 1 year was -26.5% for the 2-week group and -25.6% for the 4-week group ( $p = 0.452$ ). In multivariable analysis, age ( $p = 0.001$ ) and race ( $p < 0.001$ ) were the only significant predictors of TBWL%.

### Conclusions

Although a four-week liquid diet resulted in greater preoperative weight loss, it did not lead to improved one-year postoperative weight outcomes compared to a two-week regimen. These findings suggest that a shorter liquid diet may be sufficient in achieving comparable long-term weight loss, with implications for patient adherence and preoperative planning.

Student research funding was provided by  
Scholars Fellowship Award, School of Medicine Greenville

# Lanie Acosta, MS

Session 1  
Abstract 54



## Authors

Lanie Acosta; Lauren McAbee; Dr. Mary Blumer

## Affiliations

University of South Carolina, School of Medicine Greenville; Prisma Health

## Mentor

Mary Blumer, MD



## Incidence and Risk Factors Linked to Transfusion-Associated Circulatory Overload (TACO) At Greenville Memorial Hospital

### Background/Purpose

Transfusion-associated circulatory overload (TACO) is a post-transfusion reaction that occurs due to fluid volume overload. Typically occurring within 6 hours of transfusion, TACO can lead to pulmonary edema, acute hypoxic respiratory failure, heart failure, and, ultimately, death if left untreated. The current reported rate of TACO in transfused patients is 1%, yet it remains one of the leading causes of transfusion-related deaths. Patients at higher risk for TACO often have other comorbidities and risk factors that can also contribute to or cause volume overload, leading to diagnostic uncertainty and underreporting. Therefore, the current research aims to document the true incidence of TACO in transfused patients at Prisma Health Greenville Memorial Hospital (GMH) and the comorbidities that increase the risk of TACO.

### Methods

Briefly, to determine the incidence of TACO, chart reviews will be performed on patients who were admitted to GMH in 2024 and received a transfusion(s). Upon review, if it is determined that the patient experienced TACO, a positive diagnosis will be recorded for that patient regardless of whether the patient was initially diagnosed during their admission. Using this list of patients, the researchers will determine the comorbidities that are associated with a higher susceptibility to TACO.

### Results

Ultimately, the insight gained from this research into TACO prevalence and risk at GMH will be used to develop a tool within the EMR that alerts providers of patients who are at a greater risk of TACO.

### Conclusions

Therefore, additional precautionary measures, including administration of prophylactic diuretics and alteration of transfusion rates, can be implemented in efforts to decrease the incidence of TACO.

Student research funding was provided by  
Scholars Fellowship Award, School of Medicine Greenville

STUDENT RESEARCH  
SYMPOSIUM

# Ryan Adams, BS

Session 1  
Abstract 31



## Authors

Ryan Adams, BS; Evan Stravolo, BA; Mirinda Ann Gormley, PhD, MSPH; Tibor Nagy, DO; Daniel Schwerin, MD; Johnathon Elkes, MD; Elizabeth Mannion, MD; Aaron Dix, MBA; Ronald Pirrallo, MD; Gerald Beltran, DO

## Affiliations

University of South Carolina School of Medicine Greenville Prisma Health

## Mentor

Dr. Mirinda Gormley

## Effectiveness of Prehospital Blood Administration in Pediatric Populations: A Scoping Review Protocol



### Background/Purpose

Prehospital blood administration (PBA) is a life-saving intervention in emergency medical services (EMS) for trauma and medical resuscitations, yet inclusion of pediatric patients in PBA protocols and evidence supporting PBA effectiveness in this population remain unclear. Our scoping review maps existing literature on PBA in pediatrics, identifying key characteristics of protocols and common outcomes assessed.

### Methods

PubMed, CINAHL, MEDLINE, and Scopus were searched from database inception through June 1, 2025. We included any study design or media article written in English describing PBA provided by EMS via ground or air ambulance. Titles, abstracts, full-text selection and data extraction were performed independently by two authors and assessed by percent agreement (PA), a third author resolved disagreements. A standardized spreadsheet extracted location and operational characteristics from each source and identified sources discussing pediatric ( $\leq 16$  years) populations by assessing: inclusion of pediatrics in eligibility/exclusion criteria, inclusion of pediatrics in population, specialized protocols for pediatric blood administration, outcomes assessed for pediatrics, and outcome results. Data were synthesized and qualitatively summarized. Methods were performed following the Preferred Reporting Items for Systematic Reviews and Meta-Analyses extension for Scoping Reviews.

### Results

Investigators reviewed 3,813 titles (PA=91.2%); 256 abstracts (PA=83.9%) and 128 full texts (PA=85.0%). Ninety-seven were chosen for data extraction (PA=86.0%). Of 57 studies reporting results from a PBA program, 7 (12.3%) excluded pediatrics, 19 (33.3%) did not exclude pediatrics in eligibility/exclusion criteria but did not include them in the analysis and 31 (54.4%) included pediatrics. Of those 31, less than one-third (10, 32.3%) assessed outcomes disaggregating pediatrics from adults; occurring primarily in the USA (60.0%) with sample sizes from 10-559. Five studies reported 30-day mortality or hospital/intensive care unit (ICU) length of stay, with two studies comparing pediatric PBA recipients to a control group. Our ability to synthesize findings was limited due to small sample sizes, heterogeneity in the population, PBA protocol, and EMS operations, and variability in outcome definitions.

### Conclusions

Our findings show a significant paucity of pediatric-specific evidence supporting PBA. Pediatric populations must be included in robust studies of PBA to inform evidence-based guidelines for prehospital pediatric trauma and medical resuscitation.

Student research funding was provided by  
Scholars Fellowship Award, School of Medicine Greenville

# Joel Aguilera-Flores, BS

Session 2  
Abstract 67



## Authors

Joel Aguilera-Flores, BS; Caroline Bailey, MS; Sonia Garg, BS; David Westberry, MD; Richard Thurston, BS; Jacob Bailey, MS; Avery Callaway, PA-C; Lauren Hyer, MD; Emily Shull, PhD

## Affiliations

Shriners Hospitals for Children-Greenville; University of South Carolina, School of Medicine Greenville Prisma Health

## Mentor

David Westberry, MD

## Operative Treatment of Ectrodactyly of the Foot: A Multicenter Review of Indications, Techniques and Outcomes



### Background/Purpose

Ectrodactyly (cleft foot) is a rare congenital deformity characterized by central ray deficiency. While many cases are managed non-operatively, surgery may be indicated for pain, shoe-wearing difficulty, or cosmesis. Operative strategies include central cleft closure, ray realignment, or combined approaches, but no standardized guidelines exist. This multicenter study evaluates surgical indications, strategies, and outcomes in cleft foot reconstruction.

### Methods

A multicenter review was conducted of patients with ectrodactyly treated operatively between 2010 and 2022. Demographic, radiographic, and clinical data were collected, including preoperative shoe-wear difficulty, pain, and cosmesis concerns. Surgical indications, operative strategies, long-term outcomes, revision procedures, and complications were analyzed. Radiographic outcome parameters included forefoot splay angle and splay index.

### Results

Ninety-six feet (66 patients) underwent reconstruction at a mean age of  $5.8 \pm 4.5$  years, with mean follow-up age of  $11.3 \pm 5.7$  years. Revision was required in 13 feet (14%, 17% of patients), most often after soft tissue-only correction. Radiographs demonstrated significant improvements in forefoot splay angle ( $36^\circ$  to  $21^\circ$ ,  $p < 0.001$ ) and splay index (1.87 to 1.70,  $p < 0.001$ ). Preoperatively, 76% of the cohort reported difficulty with shoe wear, 47% reported pain, 23% had callous or skin complaints, and 14% reported cosmetic concerns. Approximately 70% of procedures were performed in Blauth type II, III, and IV deformities. Initial procedures included soft tissue closure in 13 feet, osteotomies alone in 25 feet, and combined bony and soft tissue procedures in 58 feet. Surgical techniques included 41 cleft closures with realignment, 28 simple cleft closures, 13 ray excisions, 9 hallux valgus corrections, and 2 transverse phalanx excisions. Twenty-four patients underwent bilateral procedures, 36 had unilateral procedures, and 6 underwent staged bilateral procedures.

### Conclusions

This study, the largest multicenter series on cleft foot reconstruction, demonstrates that combined bony and soft tissue procedures consistently yield durable radiographic correction and low revision rates. These findings highlight considerable management heterogeneity across centers and underscore the need for an indication-based classification system that integrates radiographic severity with patient-centered concerns to guide surgical decision making, increase consistency, and optimize outcomes.

Student research funding was provided by  
Shriners Childrens Hospital

STUDENT RESEARCH  
SYMPOSIUM

# Callum Allison, BS

## Session 1 Abstract 12



### Authors

Hunter Bohon, BS; Howell Thomas, BS; Julia Ngo, BS; Johnell Brooks, PhD; Stephan Pill, MD, MSPT

### Affiliations

USC School of Medicine - Greenville, Hawkins Foundation, Clemson University, Prisma Health

### Mentor

Stephan Pill, MD

## Association of ASES Score with Surgical Arm Steering After Shoulder Surgery: A Driving Simulation Study



### Background/Purpose

The increasing number of shoulder surgeries has raised a critical question: when is it safe for patients to resume driving? Currently, there are no formal guidelines to inform this decision, leaving providers to rely on subjective clinical judgment. The American Shoulder and Elbow Surgeons (ASES) score, a 100-point scale assessing pain and function, provides an objective measure of recovery and may help guide this decision. This pilot study aims to determine the timeline for resumption of steering with the surgical arm following rotator cuff repair or shoulder arthroplasty and to examine the relationship between ASES scores and this functional milestone.

### Methods

Patients scheduled for rotator cuff repair or shoulder arthroplasty completed a standardized driving simulation preoperatively, 3 weeks postoperatively ( $\pm 7$  days), and every 2 weeks through 9 weeks. The DriveSafety Clinical Driving Simulator's Steering Static: Level 1 measured steering, stabilization, pedal pressure, and reaction time. ASES scores and surgical versus non-surgical arm usage were recorded at each session.

### Results

Patient 5, with ASES  $> 70$ , resumed partial surgical arm use by week 7 and returned to full use by week 9, paralleling marked improvement in ASES score. Patient 8, with persistently low ASES ( $< 30$ ), relied exclusively on the non-surgical arm throughout. On average, surgical arm usage declined initially, reaching a low at week 5, then progressively increased, while non-surgical arm reliance decreased accordingly.

### Conclusions

Patients with higher ASES scores demonstrated earlier and more predictable return to steering with the surgical arm. Those with low scores showed persistent functional limitations. These preliminary findings suggest ASES scores may be useful for guiding postoperative driving clearance. Recruitment is ongoing with a target of 25 patients to confirm these trends and to inform future, larger-scale studies aimed at establishing evidence-based driving clearance guidelines after shoulder surgery.

Student research funding was provided by

Scholars Fellowship Award, School of Medicine Greenville and Prisma Health Department of Surgery

# Sarah Aloi, BS

Session 1  
Abstract 76



## Authors

Sarah Aloi, B.S.; Justin Barron, B.S.; Thomas Nathaniel, Ph.D.

## Affiliations

University of South Carolina, School of Medicine Greenville

## Mentor

Thomas Nathaniel, Ph.D.

## Predictors of Intravenous Tissue Plasminogen Activator (IV t-PA) Administration Among Ischemic Stroke Patients with Elevated Triglycerides (>200mg/dl)



### Background/Purpose

Ischemic stroke is a leading cause of death worldwide. By focusing on ischemic stroke treatment, some studies have found that there is a significant difference in the IV-tPA administration rates between men and women, while others have found that this difference may be diminishing. This study investigates how sex-specific risk factors affect IV-tPA administration in a population of ischemic stroke patients with hypertriglyceridemia.

### Methods

We conducted a retrospective review with 765 ischemic stroke patients with elevated triglycerides (>200mg/dl) who presented at a Prisma Health stroke center between January 2010 and 2016. We then conducted univariate and multivariate analyses culminating in the development of three binary logistic regression models analyzing sex-specific differences in ischemic stroke risk factors and IV-tPA administration.

### Results

We found no significant difference in IV-tPA administration between men and women with hypertriglyceridemia. However, multiple risk factors associated with IV-tPA administration were identified. In both men and women, an elevated INR and a lack of thrombolytic administration outside of the hospital were negatively associated with IV-tPA administration. Also, in both men and women, being able to ambulate independently was associated with receiving IV-tPA. In men, prior TIA was also negatively associated with IV-tPA administration. In women, the ability to ambulate independently, an inability to ambulate, and an undetermined ambulatory status were all associated with receiving IV-tPA.

### Conclusions

While no significant difference in IV-tPA administration overall between the sexes was observed, many sex-specific predictors were identified. These highlight the interaction between clinical factors and treatment of ischemic stroke. This study emphasizes the importance of individualized care in ischemic stroke treatment.

Student research funding was provided by  
Scholars Fellowship Award, School of Medicine Greenville

STUDENT RESEARCH  
SYMPOSIUM

# Grace Anderson, BS

Session 2  
Abstract 82



## Authors

Grace Anderson<sup>1</sup>; Callum Allison<sup>1</sup>; Jolie Guinn<sup>1</sup>; Michael Wolfe<sup>2</sup>; Frankie Bennett, MS<sup>1</sup>; Ginny Simmons<sup>3</sup>; Randolph Hutchison, PhD<sup>2</sup>; Larry Gluck, MD<sup>2</sup>; Jennifer L. Trilk PhD, FACSM, DipACLM<sup>1</sup>

## Affiliations

University of South Carolina School of Medicine Greenville<sup>1</sup>; Furman University<sup>2</sup>; Prisma Health<sup>3</sup>

## Mentor

Jennifer Trilk, PhD

## Regimen-Specific Impacts of Chemotherapy on Skeletal Muscle Mitochondrial Function in Patients with Breast or Gynecological Cancer



### Background/Purpose

Cachexia and mitochondrial dysfunction are common in cancer patients undergoing chemotherapy, contributing to reduced VO<sub>2</sub>max, declining skeletal muscle function, and increased chemotherapy-related fatigue. Chemotherapy-induced oxidative stress may impair mitochondrial function, though effects vary by regimen. This ongoing study uses non-invasive near-infrared spectroscopy (NIRS) to assess longitudinal changes in skeletal muscle mitochondrial function in patients with non-metastatic breast or primary gynecological cancer, with the aim of evaluating, through a case series, the varying effects of different chemotherapy regimens on skeletal muscle mitochondrial dysfunction and fatigue.

### Methods

A mixed-methods, case series observational design is being employed. Patients participate in an on/off kinetics cycling protocol, during which near infrared spectroscopy (NIRS) data is recorded (PortaMon) to non-invasively assess skeletal muscle mitochondrial function. Changes in hemoglobin oxygenation and deoxygenation of the right vastus lateralis muscle are measured while cycling on a stationary bike. We examine differences between patients and changes in mitochondrial function using parameters such as tau (time to recovery), VO<sub>2</sub>max, heart rate, rate of perceived exertion, and brief fatigue inventory, which assesses fatigue upon entering the lab prior to kinetics testing.

### Results

This study is currently in the data collection phase, with n=26 completed participants. In the case series evaluation, the NIRS model revealed a positive trend between chemotherapy cycle number and average tau, suggesting a greater mitochondrial dysfunction with chemotherapy agents doxorubicin and cyclophosphamide than with paclitaxel. In two patients receiving doxorubicin and cyclophosphamide, mitochondrial dysfunction increased during treatment, indicated by prolonged oxyhemoglobin recovery time. Upon switching to paclitaxel, both patients demonstrated improved recovery times (as indicated by a trend in lower tau values), suggesting partial restoration of mitochondrial function.

### Conclusions

Chemotherapy regimens may differentially impact skeletal muscle mitochondrial function. These preliminary findings support the need for further investigation into how specific treatments contribute to or mitigate mitochondrial dysfunction in cancer patients.

Student research funding was provided by  
Scholars Fellowship Award, School of Medicine Greenville

STUDENT RESEARCH  
SYMPOSIUM

# David Arnold

Session 1  
Abstract 100



## Authors

David H Arnold; Shannon Harold; Ella G Markalunas; Anna V Blenda; W Jeffery Edenfield

## Affiliations

Department of Biomedical Sciences, University of South Carolina School of Medicine Greenville; Department of Public Health, Brown University; Prisma Health Cancer Institute, Prisma Health; Department of Medicine, University of South Carolina School of Medicine Greenville

## Mentor

Anna V Blenda, Ph.D.

## Unmasking Mutation Patterns: A Path Toward Improving Colon Cancer Care



### Background/Purpose

The diversity of colon cancer holds the potential personalization of regimens for individuals, such as targeted therapies for mutations in BRAF, KRAS, and PIK3CA. While studies have analyzed patient responses to colon cancer therapies based on genetic mutations in a handful of genes, our research takes a comprehensive approach by examining the interplay between a larger set of mutated cancer-critical genes and treatment options. This project aims to explore the relationships between colon cancer mutations, treatment plans, and responses to determine how genetic mutations influence the outcomes to certain regimens.

### Methods

Clinical data for 181 colon cancer patients was obtained from the Prisma Health Cancer Institute's Biorepository derived from EPIC®. The mutation status of 50 cancer-critical genes in those patients was determined through multiplex PCR using Ion Ampliseq Cancer Hotspot panel v2 by Precision Genetics and USC Functional Genomics Core. Data analysis was performed using Microsoft Excel and R (version 4.4.2).

### Results

The most frequently mutated genes in this group of colon cancer patients were TP53 (54.1%), KRAS (37.6%), and APC (33.7%). A greater proportion of Black patients had mutated JAK3 compared to White patients ( $p > 0.001$ ), with 88.9% of Black patients having a p.Pro132Thr JAK3 mutation. All patients with mutated JAK3 had at least one co-occurring mutation in another gene including APC, KRAS, and PIK3CA. FOLFOX treatment alone was utilized in 23.9% as first-line therapy, capecitabine in 14.9%, and FOLFOX + bevacizumab in 11.7%.

### Conclusions

Our preliminary analysis highlights the predominance of TP53, KRAS, and APC, supporting the mutated gene distribution observed in previous studies. The higher frequency of JAK3 mutations in Black patients requires further exploration, as JAK3 is rarely discussed in prior literature in the setting of colon cancer but has been associated with poorer outcomes in other solid tumors such as gastric cancer.

# Meaghan Arnold, BS

Oral Presentation  
Abstract 97



## Authors

M Arnold; E McKay; A Saha; AR Huppmann

## Affiliations

Department of Biomedical Sciences, USC SOMG; Department of Pediatrics, Prisma Health

## Mentor

Alison, Huppmann, MD

## The Impact of the Molecular Characterization Initiative on Care of Pediatric, Adolescent, and Young Adult Cancer Patients



### Background/Purpose

Recent advances in molecular profiling have significantly enhanced the diagnosis and treatment of pediatric malignancies. The Molecular Characterization Initiative (MCI), part of the National Cancer Institute's Childhood Cancer Data Initiative, provides comprehensive molecular testing at no cost to patients enrolled in the Children's Oncology Group protocol APEC14B1 (Project:EveryChild).

### Methods

This retrospective study assessed the institutional impact of MCI testing at Prisma Health Children's Hospital Upstate. Records of patients enrolled in APEC14B1 through July 2025, were reviewed. Outcomes evaluated included whether the MCI results led to a change in diagnosis or change in treatment, whether germline findings were known prior to MCI testing, and cost of the molecular tests if not provided through the protocol.

### Results

Forty-seven patients had at least partial MCI testing. MCI results altered the diagnosis in 3 patients (6%), further subclassified the diagnosis in 1 patient (2%), and confirmed the diagnosis in all other patients (92%). MCI testing led to treatment changes in 18 patients (38%), and an additional 9 patients (19%) had actionable findings that could inform future therapy. Germline mutations were identified in 8 patients (17%), 6 of which (75%) were previously unknown. The mean cost avoided per patient was \$8,097.87 (range: \$3,100-\$9,900).

### Conclusions

MCI data provided immediate or potential future treatment changes in over half (57%) of patients. Germline mutations were frequent, potentially affecting personal and family health care. The protocol saved patients thousands of dollars in possible charges. MCI testing demonstrates direct clinical utility in pediatric oncology, supporting its integration into routine pediatric cancer care.

STUDENT RESEARCH  
SYMPOSIUM

# Emanuel J Ayala, MS

Session 2  
Abstract 94



## Authors

Emanuel J. Ayala, M.S.; Bradley Elliott, B.S.; Alex Vandenberg, B.S.; Namratha Appaji, B.S.; Hee Chang Shin, M.S.; and Jeoung Soo Lee, Ph.D.

## Affiliations

USC School of Medicine Greenville, University of South Carolina, Greenville, SC 29605 USA; Drug Design, Development, Delivery (4D) lab, Department of Bioengineering, Clemson University, Clemson, SC 29634, USA

## Mentor

Jeoung Soo Lee, Ph.D.



## Synergistic effects of rolipram loaded PgP (Rm-PgP) and minocycline on motor and cognitive function, and secondary injury in a rat moderate controlled cortical impact (CCI) TBI model

### Background/Purpose

Traumatic brain injuries (TBI) are a major cause of morbidity and mortality. The initial injury causes immediate cellular and structural damage followed by a delayed secondary inflammatory response. After TBI, cAMP level decreases due to degradation by activated phosphodiesterase 4 (PDE4) enzymes. Therefore, restoration of the cAMP level is a promising target for the treatment of TBI. Rolipram (Rm), a PDE4 inhibitor, can restore cAMP level and mitigate neuroinflammation after TBI. One challenge for the clinical use of rolipram is its low water solubility. In our lab, we developed an amphiphilic copolymer, poly (lactide-co-glycolide)-graft-polyethylenimine (PgP) for delivery of hydrophobic drugs. In our previous study, Rm delivered by PgP (Rm-PgP) reduced secondary neuroinflammation and improved motor function in a rat controlled cortical impact (CCI) rat model. Minocycline, a tetracycline antibiotic, has also been shown to provide neuroprotective benefits in settings of TBI. Here, we evaluate the synergistic effect of Rm-PgP intraparenchymal (IPa) injection with Minocycline (Mino) intraperitoneal (i.p.) injection in a rat moderate CCI TBI model.

### Methods

After injury, rats were randomly assigned to one of three groups (n=7-8/group): 1) Untreated TBI: TBI + saline (IPa inj.), 2) TBI-Mino: Mino (i.p. inj. for 5 days), and 3) TBI-Rm-PgP + Mino: Rm-PgP(IPa inj.) + Mino (i.p. inj. for 5 days). Motor function was analyzed using beam walk and rotarod at timepoints 1, 3, 5, and 7 days post injury (DPI). Rats were sacrificed at 7 DPI after functional studies via cardiac perfusion and brains were harvested, sectioned and stained for histological analysis.

### Results

We observed that motor function in Rm-PgP with Mino treatment group showed slightly better motor function compared to untreated TBI group even though it is not significantly different.

### Conclusions

Currently, we are analyzing the effect of Rm-PgP with Mino treatment on secondary injury by histological analysis.

Student research funding was provided by  
Scholars Fellowship Award, School of Medicine Greenville

# Amariyah Ayee, MS

## Oral Presentation Abstract 91



### Authors

Amariyah Ayee, MS; Audrey Richards; Edward Frongillo, PhD

### Affiliations

University of South Carolina, School of Medicine Greenville; University of South Carolina, Arnold School of Public Health

### Mentor

Edward Frongillo, PhD

## Stability in Vulnerability: Longitudinal Assessment of Material Need Insecurity in Patients with Cardiovascular Disease and HIV



### Background/Purpose

Material-need insecurities remain a widespread issue in the U.S., with significant implications for individuals living with chronic illness, contributing to mental health challenges, disease exacerbation, and harmful management strategies. Stability is a critical, yet underexplored domain of material-need insecurity. This study aims to examine the role of stability in multiple material-need insecurities among individuals with chronic illness, evaluate the underlying causes & consequences of these insecurities, and assess strategies used to address them.

### Methods

Qualitative interviews were conducted with 41 participants in the MACS/WIHS Combined Cohort Study living in San Francisco, Baltimore, and Birmingham. All participants had HIV or cardiovascular disease and at least one form of material need insecurity (e.g., food, housing, financial, or healthcare). Semi-structured interviews were conducted at baseline, with 34 completing a follow-up interview 6–18 months later. Participant memos were written to trace stability-related events and changes between the two interviews. Using the constant comparison method, we derived themes reflecting the nature and effects of stability and instability.

### Results

Anticipated instability generated significant psychological stress, with housing instability producing the greatest disruption to health management and well-being. Stability, particularly with housing and transportation, supported medication adherence and autonomy, while instability in even one insecurity often cascaded into others. Loss of resources such as public insurance or food stamps rapidly destabilized finances, especially for caregivers. Although healthcare security was generally stable, health was indirectly undermined by stress from instability elsewhere, with mental health decline often preceding physical deterioration. Programs requiring constant re-certification amplified stress, while dependable supports fostered sustained stability.

### Conclusions

Interventions that promote long-term stability, particularly in housing and income, are needed to reduce cascading risks and support better health outcomes for people with chronic illness. Recognizing stability as a distinct and measurable domain of material-need insecurity can guide future programs and policies.

Student research funding was provided by  
Scholars Fellowship Award, School of Medicine Greenville

# Caroline Bailey, MS

Session 2  
Abstract 66



## Authors

Joel Aguilera-Flores, BS; Caroline Bailey, MS; Sonia Garg, BS; David Westberry, MD; Richard Thurston, BS; Jacob Bailey, MS; Avery Callaway, PA-C; Lauren Hyer, MD; Emily Shull, PhD

## Affiliations

University of South Carolina, School of Medicine Greenville; Shriners Children's Hospital, Greenville

## Mentor

Jacob Bailey, M.S.

## Operative Treatment of Ectrodactyly of the Foot: A Multicenter Review of Indications, Techniques and Outcomes



### Background/Purpose

Ectrodactyly (cleft foot) is a rare congenital deformity characterized by central ray deficiency. While many cases are managed non-operatively, surgery may be indicated for pain, shoe-wearing difficulty, or cosmesis. Operative strategies include central cleft closure, ray realignment, or combined approaches, but no standardized guidelines exist. This study evaluates surgical indications, strategies, and outcomes in ectrodactyly reconstruction.

### Methods

A multicenter review was conducted of patients with ectrodactyly treated operatively between 2010 and 2022. Demographic, radiographic, and clinical data were collected, including preoperative shoe-wear difficulty, pain, and cosmesis concerns. Surgical indications, operative strategies, long-term outcomes, revision procedures, and complications were analyzed. Radiographic outcome parameters included forefoot splay angle and splay index.

### Results

Ninety-six feet (66 patients) underwent reconstruction at a mean age of  $5.8 \pm 4.5$  years, with mean follow-up age of  $11.3 \pm 5.7$  years. Revision was required in 13 feet (14%, 17% of patients), most often after soft tissue-only correction. Radiographs demonstrated significant improvements in forefoot splay angle ( $36^\circ$  to  $21^\circ$ ,  $p < 0.001$ ) and splay index (1.87 to 1.70,  $p < 0.001$ ). Preoperatively, 76% of the cohort reported difficulty with shoe wear, 47% reported pain, 23% had callous or skin complaints, and 14% reported cosmetic concerns. Approximately 70% of procedures were performed in Blauth type II, III, and IV deformities. Initial procedures included soft tissue closure in 13 feet, osteotomies alone in 25 feet, and combined bony and soft tissue procedures in 58 feet. Surgical techniques included 41 cleft closures with realignment, 28 simple cleft closures, 13 ray excisions, 9 hallux valgus corrections, and 2 transverse phalanx excisions. Twenty-four patients underwent bilateral procedures, 36 had unilateral procedures, and 6 underwent staged bilateral procedures.

### Conclusions

Operative management of foot ectrodactyly provides favorable functional and aesthetic outcomes. Combined bony and soft tissue strategies were most common, yielding significant radiographic correction and relatively low revision rates.

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Shriners Children's Hospital

STUDENT RESEARCH  
SYMPOSIUM

# E. Palmer Ball, MS

## Session 2 Abstract 3



### Authors

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### Mentor

Jennifer Grier, PhD

## A Review of *Trichomonas vaginalis* Immunomodulation by Co-Infection Status



### Background/Purpose

*Trichomonas vaginalis* (TV) is the most prevalent non-viral sexually transmitted infection (STI) worldwide, yet it remains underdiagnosed and understudied despite significant reproductive health consequences. TV infection is linked to pelvic inflammatory disease, infertility, preterm birth, cancer, and heightened susceptibility to HIV, but its role in co-infection with other bacterial STIs, such as *Neisseria gonorrhoeae* (NG) and *Chlamydia trachomatis* (CT), remains poorly understood.

### Methods

This is a review of existing literature analyzing immunomodulation by TV, co-infections with NG, CT, and bacterial vaginosis (BV), as well as highlighting opportunities for future research studies.

### Results

While the immunopathogenesis of TV has been increasingly described, the mechanisms by which TV may increase risk for NG and CT acquisition or persistence remain unclear. Emerging evidence suggests that TV-induced inflammation and disruption of the vaginal microbiota may create an immune environment favorable to co-infection. Epidemiological studies demonstrate higher-than-expected TV/CT and TV/NG co-infection prevalence, particularly in high-risk populations, yet few investigations have stratified by TV infection status or explored immunologic interactions. Moreover, some research has alluded to bacterial vaginosis (BV), a common yet undertreated overgrowth of bacteria in the vagina, may further promote TV infection; despite this knowledge, these conditions are not considered common co-infections.

### Conclusions

This review synthesizes current knowledge of TV-mediated immune modulation and highlights critical gaps in understanding the immunological interplay of TV co-infections with bacterial vaginosis (BV), CT and NG. Elucidating these pathways is essential for improving diagnostic strategies, informing treatment guidelines, and addressing disparities in STI burden.

Student research funding was provided by  
Scholars Fellowship Award, School of Medicine Greenville

# Justin Barron, BS

## Session 1 Abstract 5



### Authors

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### Mentor

Jennifer Grier, PhD

## Analyzing Human Gene Expression in *Acinetobacter baumannii* infection with Dual RNA-Sequencing



### Background/Purpose

The World Health Organization classifies *Acinetobacter baumannii* as one of three critical-priority pathogens. *A. baumannii* has become increasingly resistant to antibiotics, making research on its pathogenesis and novel treatment options clinically necessary. Gene expression studies in pathogenic infections show promise in pharmaceutical targeting. Specifically, dual-RNA sequencing provides a snapshot of bacterial and host RNA expression during infection, improving our understanding of pathogenesis, host response, and treatment strategies. In this study, we evaluated the transcriptional response to *A. baumannii* infection to identify key pathways regulated during respiratory infection with this priority pathogen.

### Methods

Total RNA was collected from human lung epithelial cells (A549), six hours post-infection with *A. baumannii* (multiplicity of infection=25) or mock infection. Extracted RNA was subjected to Ribosomal RNA depletion followed by dual-RNA sequencing. Differential expression was calculated relative to mock infected cells using a log fold change algorithm in R. Subsequently, pathway analysis was performed using the Panther Classification System database for RNA sequences with a significant change in expression between groups.

### Results

We identified 184 RNA sequences with  $\geq$  two-fold magnitude of change, irrespective of direction, between groups with an adjusted P-value  $< 0.05$ . Of these, 123 were upregulated and 61 were downregulated in infected cells. Pathway analysis identified a significant proportion of downregulated sequences relating to chromatin binding, and upregulated sequences relating to protein modifying enzymes, protein activity modulators, gene-specific transcriptional regulators, and intercellular signaling molecules.

### Conclusions

This work provides insight into the complex genetic interactions between human lung epithelial cells and *A. baumannii* during early infection, particularly the impact of infection on protein modifications and chromatin regulation. Future work will expand upon this insight through evaluation of the late phase of infection, and the bacterial transcriptome in parallel. The RNA sequences uncovered in this, and future studies may serve as viable targets for novel infection treatments.

Student research funding was provided by  
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# Vanessa Bartholomew, BS

Session 2  
Abstract 74



## Authors

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## Mentor

Melissa Hite, M.D.



## Post-Diverticulitis Colonoscopy: Referral Patterns, Completion Rates, and Cancer Detection in a Cohort of 762 Patients

### Background/Purpose

Diverticulitis, an inflammation of colonic diverticula, is common among older adults. Clinical guidelines recommend a follow-up colonoscopy to rule out underlying pathologies, such as colorectal cancer (CRC). However, adherence varies based on patient and system-level factors. This study evaluated adherence to colonoscopy recommendations following diverticulitis, referral patterns, and identified barriers to care.

### Methods

A retrospective chart review was conducted of 762 adults presenting to the emergency department of a single academic center with CT-confirmed diverticulitis (January 2023-January 2024). Outcomes included rates and timing of colonoscopy after diverticulitis, referral patterns, colonoscopy findings, and disparities by demographic and socioeconomic factors.

### Results

Of 762 patients, 609 (79.9%) had uncomplicated and 153 (20.1%) had complicated diverticulitis. Colonoscopy was recommended in 399 (52.4%), of whom 218 underwent the procedure: 117 (29.3%) timely, 101 (25.3%) delayed, and 166 (41.6%) not completed. Findings on follow-up colonoscopy (n=218) revealed adenomas in 37.2%, advanced adenomas in 4.1%, and CRC in 0.9% (n=2), both in patients with complicated diverticulitis. Among complicated cases not completing colonoscopy, reasons included prior colonoscopy within 5 years (46.8%), need for surgery (21.3%), lack of referral (8.5%), multiple episodes (6.4%), and loss to follow-up (10.6%). There was no statistically significant difference in demographics between patients who did and did not complete follow-up. Patients without a primary care provider were significantly less likely to undergo colonoscopy (p=.001). Trends suggested higher adherence among patients with prior colonoscopy, cancer history, and private insurance, though not statistically significant.

### Conclusions

Post-diverticulitis colonoscopy completion rates remain below guideline targets; however, many missed scopes were clinically justified. The low CRC detection rate, particularly among uncomplicated cases, raises concern for over-referral and potential overuse of colonoscopy. Disparities related to primary care access, insurance, and referral coordination were identified. A system-level, structured, evidence-based pathway could prioritize high-risk patients, improve care coordination, and reduce inequities.

# Connor Bates, BS

Session 1  
Abstract 75



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## Mentor

Christopher Farrell



## PPIs with Chemotherapy: Inducing Multi-Drug Resistance (MDR) with Omeprazole in Esophageal Cancer Cell Lines

### Background/Purpose

Multi-drug resistance (MDR) is partly mediated by ABCB1 and ABCG2 genes, which encode ATP-binding cassette (ABC) transporters. Upregulation of these genes allows for elimination of cytotoxic drugs via membrane-bound efflux pumps. Omeprazole, the 9th most prescribed medication in the United States, and is frequently taken by patients with esophageal cancer (EC), has been shown to decrease the effectiveness of capecitabine and lower long-term survival of EC. Preliminary data indicates that omeprazole heightens expression of ABCB1 and ABCG2 in certain colorectal and esophageal cancer cell lines. This study hypothesizes that omeprazole will induce MDR in chemotherapy-naïve EC lines.

### Methods

The first part of the investigation examines DNA/RNA extracted from colorectal cancer specimens, which are separated into groups of patients that were taking omeprazole and those not taking any medications. The DNA/RNA is extracted using a Qiagen kit, quantified, and assessed for their A260/A280 ratio, to ensure adequate material for sequencing, which will focus on transporter genes and drug pathways that indicate MDR. The second part of the experiment involves culturing EC lines (OE33) over 4 months and dividing them into experimental and control groups. The experimental group consists of cells treated with low (10  $\mu$ M) and high (50  $\mu$ M) concentrations of omeprazole, while the positive control group is treated with paclitaxel (a known inducer of ABCB1 and ABCG2), and the negative control group is treated with RPMI and DMSO. The lysates are analyzed for MDR expression via q-PCR and RNA sequencing.

### Results

Results of sequencing for the frozen clinical specimens is still pending, and cell culturing is in-progress, with treatment groups established to induce MDR expression.

### Conclusions

The results of this study could be used to inform clinical practice decisions regarding the inclusion of PPIs in the treatment regimen for esophageal adenocarcinoma.

Student research funding was provided by  
Scholars Fellowship Award, School of Medicine Greenville

# Anna E. Bazell, BS

## Session 1 Abstract 71



### Authors

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### Mentor

Kacey Marra, PhD

## Perioperative Nutrition in Plastic Surgery: A Systematic Review of Screening Tools and Nutritional Interventions (2010-2025)



### Background/Purpose

Perioperative nutrition is a key determinant of surgical recovery, with direct effects on complications, wound healing, and length of stay. Up to one in four plastic surgery (PS) patients are at risk for malnutrition, making pre-operative nutritional status particularly important in this field. Despite its established importance, there are limited standardized PS specific perioperative nutrition guidelines, and current practice relies on general surgery tools. This review evaluates United States (U.S.) studies published from 2010-2025 to assess reported screening tools, nutritional interventions, and gaps in guideline development for perioperative PS care.

### Methods

A literature review was conducted in accordance with PRISMA guidelines, searching PubMed, Embase, and Web of Science Library for studies published between 2010 and 2025. Eligible studies were (1) U.S. based, (2) published in English, and (3) addressed perioperative nutrition in PS, including nutritional assessment tools, management strategies, interventions, or reported outcomes.

### Results

Of the 97 studies identified, 10 met inclusion criteria after screening. Six articles (60%) reported on pediatric PS nutritional interventions and four (40%) articles on adult PS nutritional guidelines. Subspecialties included six (60%) Craniofacial, two (20%) Breast, and two (20%) Head & Neck Reconstruction articles. The majority (50%) of articles discussed clinical indications for parenteral nutritional interventions (i.e. J-tube placement). Three (30%) explored the utility of pre-operative albumin screening, one (10%) described monitoring weight fluctuations, and one (10%) utilized the Nutrition Related Index (NRI).

### Conclusions

The majority of plastic surgery literature focused on pediatric craniofacial nutritional interventions and assessments. Multiple studies reported an association between pre-operative parenteral management and albumin level screening with hospital stay length, post-operative complication rate, and readmission rate. Though similar interventions were reported, their implementation was largely unstandardized across the included articles. Future research is needed to develop standardized nutritional practice guidelines specific to plastic surgery patients.

# Mya Beasley, BS Georgia Roper, BS

Session 1  
Abstract 39



## Authors

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## Mentor

Christine Schammel, PhD

## Exploring the Therapeutic Potential of Frequency-Modulated Tumor Treating Fields in Glioblastoma Multiforme In Vitro



### Background/Purpose

Glioblastoma multiforme (GBM) is the most common and aggressive primary brain tumor in adults, with a five-year survival rate of approximately 5% and a median survival of 15 months. Tumor Treating Fields (TTFields) are a non-invasive therapy that uses alternating electric fields to disrupt mitosis and reduce tumor growth. Recent studies suggest that frequency-modulated TTFields (FM-TTFields) may enhance therapeutic efficacy compared to unmodulated TTFields (UM-TTFields), particularly in aggressive tumor types.

### Methods

Two established GBM cell lines, LN229 (chemosensitive) and LN18 (chemoresistant), were cultured and treated with UM-TTFields or FM-TTFields for 24, 48, and 72 hours. Cell viability was assessed using 7-AAD and Annexin-V staining followed by flow cytometry. Images were captured at each time point to evaluate morphological changes.

### Results

LN229 cells treated with UM-TTFields showed average viabilities of 84%, 98%, and 79% relative to controls at 24, 48, and 72 hours, respectively. FM-TTField treatment resulted in viabilities of 81%, 82%, and 89% at the same time points. Both UM-TTFields ( $p < 0.05$ ) and FM-TTFields ( $p < 0.01$ ) significantly reduced viability at 24 hours, with UM-TTFields also causing a significant decline at 72 hours ( $p < 0.01$ ). LN18 cells treated with UM-TTFields demonstrated viabilities of 93%, 95%, and 88% at 24, 48, and 72 hours, respectively, while FM-TTField treatment yielded 68%, 84%, and 60%. FM-TTFields significantly reduced LN18 viability at 24 hours ( $p < 0.01$ ).

### Conclusions

Contrary to expectations, both UM-TTFields and FM-TTFields produced only modest reductions in cell viability compared to controls. The high standard errors suggest that the treatment may have been non-uniformly distributed among all cells. Future studies will use coverslips to lift cells closer to electrodes and ensure all cells analyzed in the results are uniformly treated. These refinements aim to better evaluate the potential therapeutic advantage of FM-TTFields in GBM treatment.

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STUDENT RESEARCH  
SYMPOSIUM

# Mya Beasley, BS Georgia Roper, BS

Session 2  
Abstract 65



## Authors

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## Mentor

Christine Schammel, PhD

## Obstacles and Possible Solutions Regarding Use of Tumor Treating Fields on Glioblastoma Multiforme in vitro



### Background/Purpose

Tumor Treating Fields (TTFields) therapy using an FDA-approved wearable device has shown significant improvements in overall survival and progression-free survival of glioblastoma multiforme (GBM). Prior studies found that frequency-modulated TTFields (FM-TTFields) enhanced the therapeutic potential of TTFields; however, our attempts to replicate this in GBM cell lines in vitro yielded highly variable results with large standard errors. The aim of this discussion is to identify obstacles in the experimental execution and propose solutions for researchers encountering similar difficulties.

### Methods

GBM cell lines LN229 and LN18, were cultured and treated with UM-TTFields and FM-TTFields and analyzed using flow cytometry. Imaging was performed at 24, 48, and 72hr with the goal of being removed from treatment for <1hr. The TTFields electrodes were inserted into the wells and sealed in place. During this process, multiple technical and procedural obstacles interfered with both cell culture and experimentation.

### Results

Identified problems included fungal contamination, extended imaging time, non-uniform treatment distribution over, potential inconsistencies in TTFields output, and malfunctioning CO2 sensors on cell culture incubators. These factors likely contributed to the high standard error and great variability between experimental results. Increasing sterile precautions, ensuring uniform treatment of cells using coverslips, and enhancing equipment monitoring may mitigate some of these issues.

### Conclusions

Despite clear methodologies presented by current literature, unexpected difficulties frequently arise in in vitro studies, yet these challenges are rarely reported. By presenting the obstacles encountered and potential solutions in conducting in vitro experiments with TTFields and GBM cells, this work aims to guide future researchers, improving reproducibility and facilitating experiments that may ultimately enhance GBM treatment efficacy, survival, and patient quality of life.

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STUDENT RESEARCH  
SYMPOSIUM

# Mya Beasley, BS

## Oral Presentation Abstract 49



### Authors

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### Mentor

Christine Schammel, PhD



## Imaging Modalities for Preoperative Location of Parathyroid Adenomas: Increasing Efficiency

### Background/Purpose

Parathyroid adenomas are benign tumors that cause primary hyperparathyroidism through autonomous PTH secretion. Accurate preoperative localization is essential for minimally invasive parathyroidectomy and reducing operative morbidity. Common imaging modalities include ultrasound, technetium-99m sestamibi (Tc-99m MIBI), four-dimensional CT (4D-CT), and SPECT/CT. This study evaluates the performance of these modalities in identifying and localizing parathyroid adenomas at a single institution.

### Methods

A retrospective chart review was conducted of patients who underwent parathyroidectomy at a single institution from 2016–2024. Imaging results were classified as positive or negative. Surgical localization confirmed by intraoperative PTH drop and histopathology served as the gold standard. Sensitivity, specificity, positive predictive value (PPV), negative predictive value (NPV), and accuracy were calculated for each modality.

### Results

Ultrasound (n=54) demonstrated a sensitivity of 50.00%, specificity of 33.33%, PPV of 77.78%, NPV of 12.50%, and accuracy of 47.06%. 4D-CT (n=48) showed sensitivity 71.43%, specificity 14.29%, PPV 71.43%, NPV 14.29%, and accuracy 57.14%. Tc-99m MIBI (n=44) had sensitivity 55.00%, specificity 50.00%, PPV 84.62%, NPV 18.18%, and accuracy 54.17%. SPECT/CT (n=12) achieved the highest specificity (100.00%) and PPV (100.00%), with sensitivity 66.67%, NPV 33.33%, and accuracy 71.43%; however, the small sample size may limit generalizability.

### Conclusions

Preliminary results indicate that no single modality demonstrated both high sensitivity and specificity. SPECT/CT showed the highest accuracy and perfect PPV, though results are limited by small sample size. Tc-99m MIBI and SPECT/CT positives were often correct, but all modalities had low NPVs, limiting the reliability of negative studies. These findings support a multimodal imaging approach, combining high-sensitivity and high-specificity techniques to enhance localization accuracy, guide surgical planning, and improve patient outcomes in primary hyperparathyroidism.

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Scholars Fellowship Award, School of Medicine Greenville, Prisma Health Department of Radiology

# John Benedetto, BS

Session 2  
Abstract 40



## Authors

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## Mentor

Erin R. Weeda, PharmD



## Factors associated with the use of intravenous opioids among patients treated with ketorolac for nephrolithiasis in the emergency department

### Background/Purpose

Although seemingly benign, receipt of opioids in the emergency department (ED) has been identified as a risk factor for long-term opioid use. Little is known about opioid use patterns in the setting of nephrolithiasis pain management in the ED. We sought to describe patient- and facility-level factors associated with the administration of intravenous (IV) opioids to patients treated with ketorolac for nephrolithiasis in the ED.

### Methods

Patients with nephrolithiasis treated in the ED and discharged home were identified for inclusion and stratified into groups who received IV opioids plus IV ketorolac or IV ketorolac without IV opioids, using a national US ED dataset from 2021-2022. Chi square and Fisher's exact tests were used to conduct univariable analysis, and a backwards elimination approach was used for multivariable analysis.

### Results

A total of 127,395 individuals were identified in the dataset for inclusion, of which 59,916 received an IV opioid. Obesity (odds ratio [OR] 1.353), an income level in the 76th-100th percentile (OR 1.341), a history of cancer (OR 1.305), and depression (OR 1.304) occurred more frequently among patients treated with IV opioids. In comparison to facilities in the Northeastern US, facilities in the Western US (OR 1.898), Midwestern US (OR 1.643), and Southern US (OR 1.555) administered IV opioids to patients more often.

### Conclusions

In this study, a multitude of variables were associated with IV opioid use for nephrolithiasis pain management in the ED. These findings suggest that both clinical and contextual variables may influence opioid utilization practices in nephrolithiasis management.

STUDENT RESEARCH  
SYMPOSIUM

Student research funding was provided by  
Scholars Fellowship Award, School of Medicine Greenville

# Meredith Bhend, BS

## Session 1 Abstract 16



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### Mentor

Dr. Ki Chung, MD and Dr. Christine Schammel, PhD

## CA19-9 Levels as Predictors of Progression in Pancreatic Adenocarcinoma



### Background/Purpose

Pancreatic adenocarcinoma (PAC) remains one of the most lethal malignancies with a 5 year survival of <10% due to its difficulty to diagnose and high recurrence rate. CA19-9 is a tumor-associated antigen that is elevated in 90% of patients with PAC. It is commonly assessed in these patients to track overall prognosis and disease progression. Elevated CA19-9 has been linked to poorer prognosis and some studies have indicated CA19-9 levels may rise months before radiographic evidence of disease progression. These findings indicate potential utility in CA19-9 as a predictive biomarker, but elevation from benign conditions and false negatives in individuals with the Lewis antigen-negative genotype complicate its use. The goal of this study is to evaluate the levels of CA19-9 associated with disease progression in patients with PAC and to identify the predictive value of CA19-9 levels using CT imaging as the clinical standard for comparison.

### Methods

This is an ongoing retrospective study of patients diagnosed or treated at a single institution with histologically confirmed stage I-III PAC who underwent surgical resection of their original tumor. Those included in the study underwent serial CA19-9 testing and CT imaging. Data collection is completed, including CA19-9 levels, imaging findings, demographics, and relevant clinical variables. The primary aim is to correlate CA19-9 levels with imaging-confirmed disease progression. Secondary analyses will assess whether CA19-9 elevation precedes radiographic recurrence and evaluate the time interval between marker elevation and imaging changes.

### Results

Preliminary findings suggest CA19-9 levels rise drastically with disease progression, particularly in metastatic recurrence, and may precede imaging findings in some cases. Statistical analysis is ongoing to determine the sensitivity, specificity, and predictive value of CA19-9 in this context.

### Conclusions

Early findings support CA19-9 as a potential early marker of recurrence in PAC. Further analysis may inform surveillance strategies and optimize follow-up timing.

Student research funding was provided by  
Scholars Fellowship Award, School of Medicine Greenville

# James Bowron, BS

Session 1  
Abstract 51



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## Mentor

Ben Ho Park, MD, PhD

## Improving liquid biopsy sensitivity by enhancing cfDNA yield through chemical modification



### Background/Purpose

Cell-free DNA (cfDNA) and its tumor-derived fraction, circulating tumor DNA (ctDNA), are promising biomarkers for non-invasive cancer monitoring. However, the sensitivity of liquid biopsy assays is limited by low cfDNA abundance and nuclease-mediated degradation. Our goal was to evaluate whether combining apoptosis-inducing agents with nuclease inhibition could increase cfDNA yield and integrity, thereby improving liquid biopsy sensitivity.

### Methods

We treated breast (MCF-10A, MDA-MB-468) and colorectal (HCT116) cell lines with DR5 agonists (TRAIL, Conatumumab, Tigatuzumab) across dose ranges and time courses. cfDNA was quantified by fluorometric assays and fragment size distributions were analyzed on an Agilent TapeStation. To assess nuclease inhibition, sodium EDTA was applied in vitro and administered intraperitoneally in mice (25 mg/kg, 2–30 minutes before sacrifice). Plasma cfDNA was quantified and fragment profiles compared to untreated controls.

### Results

DR5 agonists significantly increased cfDNA release in a concentration-dependent manner, with Annexin V staining confirming apoptosis as the mechanism of release. EDTA treatment preserved cfDNA integrity in vitro, shifting MCF-10A fragment profiles toward larger sizes and increasing the proportion of longer fragments in MDA-MB-468 cells. In vivo, EDTA transiently enhanced cfDNA yield, with peak concentrations observed at 2 minutes post-injection. TapeStation analysis further demonstrated that EDTA increased both cfDNA concentration and fragment size compared to untreated controls.

### Conclusions

Our findings support a two-pronged strategy to improve cfDNA recovery: promoting apoptotic release with DR5 agonists and preserving fragment integrity with EDTA. By enhancing both the quantity and stability of cfDNA, this approach has the potential to markedly increase the sensitivity of liquid biopsy assays. Improving liquid biopsy sensitivity could better inform oncologists' treatment decisions while potentially limiting unnecessary adjuvant therapy by identifying patients who are truly cured.

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Scholars Fellowship Award, School of Medicine Greenville

STUDENT RESEARCH  
SYMPOSIUM

# Sally Brown, BS

Session 2  
Abstract 58



## Authors

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## Mentor

Neha Hudepohl, MD

## Investigating the bidirectional relationship between lactation and maternal mental health



### Background/Purpose

Numerous studies have shown that breastfeeding positively impacts maternal mental health. Conversely, there is evidence that indicates that breastfeeding can be associated with worsening mental health, especially in mothers experiencing breastfeeding challenges. It has also been shown that mothers with mental health conditions are less likely to start breastfeeding or end breastfeeding earlier than mothers without mental health conditions. This study aims to investigate this complex relationship between maternal mental health and breastfeeding. Given the seemingly predominant literature findings, it is expected that having a mental health diagnosis prior to, during, or after pregnancy will be associated with lower rates of breastfeeding.

### Methods

In this retrospective study, 134 study participants' data from prepregnancy to six months postpartum was manually abstracted from Epic and entered into REDCap. A biostatistician performed statistical analysis and breastfeeding rates at hospital discharge and postpartum visits were compared between mothers with a psychiatric diagnosis and mothers without a psychiatric diagnosis.

### Results

At hospital discharge, 93.9% of mothers with no psychiatric diagnosis were breastfeeding and 81.8% of mothers with a psychiatric diagnosis were breastfeeding (OR 0.30; 95% CI 0.9, 1.00). At their postpartum visit, 70.7% of mothers with no psychiatric diagnosis were breastfeeding and 68.1% of mothers with a psychiatric diagnosis were breastfeeding (OR 0.89; 95% CI 0.38, 3.04).

### Conclusions

No association was found between having a mental health diagnosis and the likelihood of breastfeeding. These findings emphasize the fact that breastfeeding and maternal mental wellbeing do not always correlate and highlight the need for additional research. This study was limited by power due to the small sample size and potential confounders. Given that mental health conditions are a leading cause of maternal mortality, it is crucial to continue researching factors that potentially impact maternal mental health.

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STUDENT RESEARCH  
SYMPOSIUM

# Kassie Carlson, BS

Session 1  
Abstract 109



## Authors

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## Mentor

Caroline Astemborski, MD, MEHP



## Individual Learning Plans in ACGME Graduate Medical Education: Scoping Review Protocol

### Background/Purpose

Background: Individual Learning Plans (ILPs) are an educational tool used with the purpose of regulating self-improvement and aligning one's personal goals with their career goals. Students use these documents to highlight their competencies and identify areas for growth. In response to the Accreditation Council for Graduate Medical Education (ACGME) mandate to incorporate ILPs into residency programs, this scoping review aims to compile the literature on ILP use in Graduate Medical Education (GME). Objective: The main objective of this scoping review is to identify common trends, approaches, and challenges in preexisting ILP use in GME, highlight potential research gaps in ILP use, and propose future directions for research.

### Methods

Methods: We will conduct a scoping review of published articles in the following electronic databases: PubMed/MEDLINE, Embase, ERIC, Scopus, Web of Science, PsycINFO, as well as Grey literature sources, Google Scholar, ProQuest Dissertations, and conference proceedings. We will use predefined search terms of "Graduate Medical Education", "GME", and "residency" combined with other terms such as "individual learning plans", "learning plans", "learning contract", or "annual review". We have decided to exclude Undergraduate Medical Education studies as a scoping review already exists in this population, as well as excluding non-English language articles (unless translation is feasible).

### Results

Results: The initial electronic database search was completed in October 2025 and yielded 4,124 results. Retrieved articles are currently being screened, with an expected initial screen review completed by the end of 2025.

### Conclusions

Conclusion: This scoping review will highlight the variability and use of ILPs in GME. The findings will inform clinical practice and help conceptualize the best application of ILP in GME, as well as highlighting the challenges and gaps that come with it.

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Scholars Fellowship Award, School of Medicine Greenville

# Tyler Carlson, MD Candidate

Session 2  
Abstract 11



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## Association between Polypharmacy and Medication Adherence: A Meta Analysis

### Background/Purpose

Medication nonadherence is a growing concern for both the patient and healthcare system. Non-adherence to medications is associated with poor disease control, increased healthcare costs, frequent hospital admissions, and higher mortality rates. Many factors, including age, socioeconomic status, and diagnosis, could play a key role in the patient's ability to adhere to their treatment plans. One factor that has been proposed to impact medication adherence is polypharmacy; however, the relationship between polypharmacy and medication adherence has not been systematically summarized. We aimed to perform a meta-analysis to summarize real-world medication adherence in polypharmacy versus non-polypharmacy groups.

### Methods

A systematic search of Ovid Medline, Scopus, and Embase was conducted and imported into Covidence. To meet the inclusion criteria, real-world articles had to be published in the full-text form and directly compare medication adherence in polypharmacy to a reference non-polypharmacy cohort. Only studies using adherence via proportion of days covered (PDC), with a PDC cutoff of 80% for dichotomous adherence, were included. Non-adherence, defined as the proportion of patients with a PDC<80%, was the primary outcome.

### Results

A total of 8 studies evaluating 30,834 polypharmacy and 81,423 non-polypharmacy patients were included in the meta-analysis. The studies captured data spanning from 2014 to 2023. Of the polypharmacy patients, 17,727 showed nonadherence (57.7%) versus the 43,155 non-polypharmacy patients showing nonadherence (53.0%). Upon meta-analysis, there was no significant difference in medication adherence among patients experiencing polypharmacy and non-polypharmacy across included studies (Risk Ratio = 1.03 (95%Confidence Interval=0.74-1.43; I<sup>2</sup> = 98.8%).

### Conclusions

There was no difference in medication adherence in polypharmacy versus non-polypharmacy treatment regimens. These findings suggest that other factors may play a more important role in medication adherence among patients. Further studies are needed to investigate such factors.

Student research funding was provided by  
Scholars Fellowship Award, School of Medicine Greenville

STUDENT RESEARCH  
SYMPOSIUM

# Hayden Carrillo, BS

Session 1  
Abstract 62



## Authors

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## Mentor

Helen Kaiser, PhD

## Measuring Medical Student Resilience to Identify Behavioral Insights



### Background/Purpose

Medical students have high levels of anxiety, depression, and burnout, while their resilience levels, an individual's ability to overcome adversity, are often lower than the general population. Higher resilience levels measured by the validated and reliable Connor-Davidson Resilience Scale (CD-RISC-25) are associated with reduced stress, exhaustion, and higher life satisfaction. Therefore, exploring the protective potential of resilience is essential. This mixed-methods study investigates resilience among medical students and behaviors that may enhance resilience. We hypothesized that students would demonstrate lower resilience scores than the general population and that healthy lifestyle behaviors would support resilience.

### Methods

Resilience was assessed voluntarily in 48 of 110 third-year medical students at The University of South Carolina School of Medicine Greenville using the CD-RISC-25, administered via Qualtrics with a \$25 incentive. Scores were separated into quartiles compared to national norms. CD-RISC items were divided into domains: hardiness, coping, adaptability/flexibility, meaningfulness/purpose, optimism, regulation of emotion/cognition, and self-efficacy. Participants could opt into semi-structured follow-up interviews via Microsoft Teams to investigate resilience-enhancing behaviors.

### Results

The mean participant CD-RISC-25 score was 72.2 (General population:79.0). Quartiles were: Lowest: 41.7%, 2nd: 29.2%, 3rd: 20.8%, highest: 8.3%. The highest scoring domain of resilience was self-efficacy, while the lowest was optimism. Thematic analysis of the interviews revealed an overarching theme regarding how participants embody resilience: either bouncing back from or pushing through hardship. Further analysis will compare themes to CD-RISC scores.

### Conclusions

The average participant CD-RISC-25 score fell into the lowest quartile of scores which are correlated with increased anxiety, depression, and PTSD. Preliminary thematic results suggest that students' understanding of resilience differs, and that mindset can play a substantial role in a student's relationship with resiliency. It is essential that resilience-building behaviors be identified and implemented into medical students' schedules to improve their overall well-being.

Student research funding was provided by

ASPIREinG Grand Funding

STUDENT RESEARCH  
SYMPOSIUM

# Evan Case, BS

## Session 1 Abstract 111



### Authors

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Matthew Hindman, MD

## A Qualitative Analysis of White Coat Oaths and the Hippocratic Oath



### Background/Purpose

Historically, the Western medical profession has regulated itself through a consistent ethical vision formed around the Hippocratic Oath. However, beginning in the mid-20th century, many North American medical schools have shifted from the traditional Hippocratic Oath to new rituals involving annually written student-generated oaths. One such ritual is the white coat ceremony conducted at the beginning of each school year for the incoming first-year class. This qualitative study establishes a methodology for analyzing ethics-related themes in white coat oaths.

### Methods

A semantic, thematic analysis framework was used to analyze 14 student-generated white coat oaths of one Southeastern medical school and the Hippocratic Oath. The coding process involved a hybrid deductive-inductive strategy to compile a theme list of predefined themes from the literature and emergent themes from the white coat oaths. Inter-coder reliability was established through a multi-stage, iterative process involving three researchers.

### Results

In total, 50 themes were identified and categorized into Ethical Principles, Professional Virtues, Public Equity and Community Commitments, Reflective Sentiments, and Oath-binding Pledges. Four themes from the literature were not found in any of the oaths examined while 23 new themes were identified in the oaths that were not in the literature. 24 themes were present in both the literature and the analyzed oaths, and 3 themes were adapted from the literature and found in the oaths.

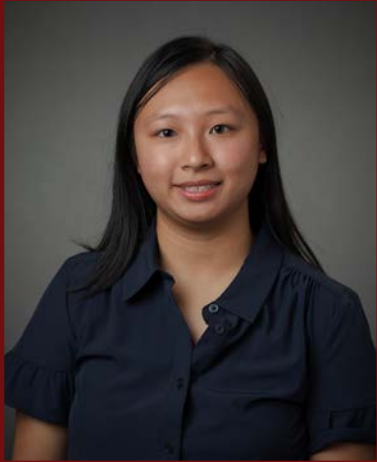
### Conclusions

With student-generated oaths, medical schools have introduced new commitments reflecting contemporary community-based concerns, such as community engagement and public health. This study established a method for coding white coat oath themes. Future research should quantitatively explore the prevalence of each theme, temporal changes in themes, and theme category prevalence in the white coat oaths. Future research could also compare differences in themes present in the white coat oaths compared to the Hippocratic Oath.

Student research funding was provided by  
Scholars Fellowship Award, School of Medicine Greenville

# Feng Chen, BS

## Session 1 Abstract 6



### Authors

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### Mentor

Kasey McDonald, DO

## Annual Wellness Visit QI Project at Center of Family Medicine-Oconee



### Background/Purpose

Annual Wellness Visits are integral in supporting healthy aging and maintaining clinic revenue. These visits occur yearly and provide physicians with the opportunity to take inventory of a patient's overall health and any concerns they may have. Working with the Center for Family Medicine Oconee, our group noticed the clinic underutilized these visits compared to the Prisma average. Using the Plan-Do-Study-Act model, our goal is to complete 80% of AWV by the end of the Fiscal Year and to reach a 10% or more increase with one of our interventions.

### Methods

We conducted a Pre and Post Intervention Study over a 3-month period while monitoring AWV completion rates within the clinic's Medicare population. The intervention consisted of listing "AWV due" as a pre-charting reminder in the notes section of Epic for each provider the weekend prior to the visit. The data was collected using Epic Slicer/Dicer and analyzed at the end of each month for each provider and the entire clinic.

### Results

We conducted a Pre and Post Intervention Study over a 3-month period while monitoring AWV completion rates within the clinic's Medicare population. The intervention consisted of listing "AWV due" as a pre-charting reminder in the notes section of Epic for each provider the weekend prior to the visit. The data was collected using Epic Slicer/Dicer and analyzed at the end of each month for each provider and the entire clinic.

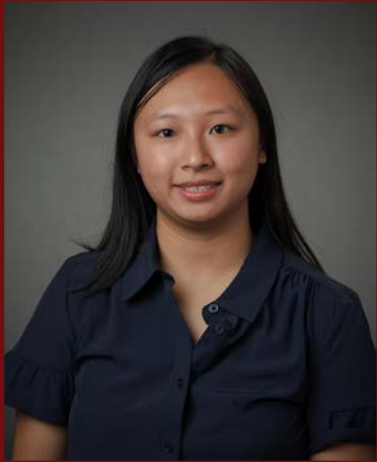
### Conclusions

We satisfied our aim statement of increasing AWV completion rates by 10% with our intervention. If rates continue to trend upwards at approximately 7% per month, the clinic would be projected to complete roughly 62% of AWV by the end of our fiscal year. Based on this current projection, we will not reach our 80% AWV completion rate goal. Nonetheless, the intervention offered meaningful insight into how to boost AWV completion rates within the CFMO clinic and ideas for future interventions.

Student research funding was provided by  
Scholars Fellowship Award, School of Medicine Greenville

# Feng Chen, BS

## Session 2 Abstract 41



### Authors

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### Mentor

Erin R. Weeda, Pharm.D., BCPS

## Factors associated with the use of intravenous opioids among patients treated with ketorolac in the emergency department for nephrolithiasis



### Background/Purpose

To describe patient- and facility-level factors associated with the administration of intravenous (IV) opioids to patients treated with ketorolac for nephrolithiasis in the emergency department (ED).

### Methods

Patients with nephrolithiasis treated in the ED and discharged home were identified for inclusion and stratified into groups who received IV opioids plus IV ketorolac or IV ketorolac without IV opioids, using the US Nationwide Emergency Department Sample database from 2021-2022. Chi square and Fisher's exact tests were used to conduct univariable analysis, and a backwards elimination approach was used for multivariable analysis.

### Results

A total of 127,395 individuals were identified in the dataset for inclusion, of which 59,916 received an IV opioid. Obesity (odds ratio [OR] 1.353), an income level in the 76th-100th percentile (OR 1.341), a history of cancer (OR 1.305), and depression (OR 1.304) occurred more frequently among patients treated with IV opioids. In comparison to facilities in the Northeastern US, facilities in the Western US (OR 1.898), Midwestern US (OR 1.643), and Southern US (OR 1.555) administered IV opioids to patients more often.

### Conclusions

In this study, a multitude of variables were associated with IV opioid use for nephrolithiasis pain management in the ED. These findings suggest that both clinical and contextual variables may influence opioid utilization practices in nephrolithiasis management.

Student research funding was provided by  
Scholars Fellowship Award, School of Medicine Greenville

# Gabrielle Choe, MBS

Session 1  
Abstract 101



## Authors

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## Mentor

Joanna Appel

## Use of Study Resources and Performance Outcomes in First-Year Medical School Anatomy



### Background/Purpose

Effective study strategies are critical in medical education, particularly in anatomy, where both short-term performance and long-term retention are essential. This study investigates the relationship between student-driven study behaviors and performance outcomes in anatomy lab practical exams at the University of South Carolina School of Medicine Greenville (USCSOMG).

### Methods

First-year medical students completed a survey reporting frequency and purpose of use for 25 anatomy study resources across three modules: Musculoskeletal/Dermatology/Rheumatology (MDR), Cardiovascular (CV), and Pulmonary. Resources were grouped into five categories: Visual Aids, Digital Tools, In-Lab Resources, Recall/Testing Tools, and Collaborative Methods. Normalized frequency scores per category were calculated and correlated with practical exam grades using Spearman analysis.

### Results

Students most frequently used lecture slides, flashcards, and in-lab resources such as cadaver review and prosection slides. While no significant correlations were found between study time and exam performance, a statistically significant positive correlation was identified between in-lab resource use and practical exam scores. Other categories showed weak or non-significant associations across modules.

### Conclusions

Findings suggest that hands-on, lab-based study tools may be particularly effective for mastering anatomical content in clinically oriented modules. These results support the integration of cadaveric and model-based review into anatomy curricula and highlight the importance of aligning study strategies with learning goals.

Student research funding was provided by  
Scholars Fellowship Award, School of Medicine Greenville

STUDENT RESEARCH  
SYMPOSIUM

# Maddi Clark, BS

Session 1  
Abstract 95



## Authors

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Jason L. Guichard, M.D., Ph.D.

## The Effect of Baroreflex Activation Therapy (BAT) on Ambulatory Hemodynamic Monitoring Parameters in Patients with Heart Failure



STUDENT RESEARCH  
SYMPOSIUM

### Background/Purpose

Background: Heart failure with reduced ejection fraction (HFrEF) remains a major clinical challenge despite continuous advancements in guideline-directed medical therapies (GDMT). Utilizing the CVRx Barostim Neo device, Baroreflex Activation Therapy (BAT) offers benefits in patients with HFrEF by increasing autonomic tone. BAT has demonstrated benefits in exercise capacity, quality of life, and hospitalization rates. Remote patient monitoring (RPM) systems such as CardioMEMS, Cordella, HeartLogic, and TriageHF enable tracking of ambulatory hemodynamic parameters and detect early signs of decompensation, allowing for more proactive treatment of HFrEF to reduce cardiac hospitalizations. The effect of BAT on ambulatory hemodynamic parameters is currently unknown. Objective: Despite the proven benefits of both RPM and BAT, their synergistic role in patient management is yet to be explored. This study aims to investigate if BAT-induced changes in autonomic function and hemodynamics can be accurately detected and quantified by RPM devices, and how these devices can be used in tandem to benefit HFrEF patient outcomes.

### Methods

A retrospective analysis will be conducted on 18 patients with chronic HFrEF who received the Barostim Neo device. Data will include comprehensive clinical, demographic, imaging, laboratory, and device-based metrics from RPM devices: CardioMEMS, Cordella, and ICD/CRT-D systems with HeartLogic and TriageHF capabilities. RPM portal and electronic medical record data will be collected for 6 or 12 months before and after BAT implantation. Statistical analysis will assess changes in RPM metrics, clinical measures, and echocardiogram findings.

### Results

Data collection is ongoing and preliminary expectations suggest there are positive RPM parameter changes following BAT implantation. These findings may provide insights into the benefits of combining BAT and RPM systems in HFrEF management.

### Conclusions

Pending analysis, the results of this retrospective evaluation of BAT's influence on RPM parameters has the potential to reshape management for patients with HFrEF.

# Olivia Comer, MS

Session 2  
Abstract 48



## Authors

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## Mentor

Renee Chosed, PhD

## Identification of Mitochondrial Proteins in Blastocoel Fluid from IVF Embryos via Mass Spectrometry



### Background/Purpose

In vitro fertilization (IVF) is an assisted reproductive technology (ART) used for patients facing infertility. The CDC reported 389,993 IVF cycles initiated in 2022, with 43.1% resulting in successful live birth outcomes for patients under 35 years old. Although preimplantation genetic testing for aneuploidy (PGT-A) can be used to assess chromosome number before implantation, further markers are desired to select the most viable embryo for uterine transfer. Our study aims to identify proteins as potential viability markers within the blastocoel fluid from IVF embryos using mass spectrometry.

### Methods

Blastocoel fluid-conditioned media was collected from euploid and aneuploid IVF-embryos at the time of TE biopsy for PGT-A. Protein concentrators were used to reduce the volume of the samples prior to trypsin digestion. Following trypsin digestion, the samples were separated using a Dionex UltiMate 3000 nano-flow liquid chromatograph with a C-18 reverse-phase capillary column and a standard acetonitrile/water gradient. The column is interfaced to a Thermo Q-Exactive quadrupole-orbitrap mass spectrometer by an integral nanospray tip. Analysis of peptides was done by tandem mass spectrometry (LC-MS/MS) using high resolution of the fragment ions. Western blots and Real-time PCR were used to verify protein and gene expression.

### Results

Mass spectrometry identified peptides from mitochondrial ATP synthase subunit alpha (ATPA) protein. ATPA protein and mRNA were present in additional blastocoel fluid samples analyzed by Western blot and Real-time PCR.

### Conclusions

ATPA is essential in cellular respiration and the generation of ATP. The presence of this protein in blastocoel fluid further supports our lab's research that mitochondrial proteins may influence embryo viability. Analysis of blastocoel fluid samples is ongoing to identify other potential mitochondrial protein markers. The identification of protein markers in blastocoel fluid from IVF embryos may serve as an additional screening tool for selecting the most viable embryo.

Student research funding was provided by  
Scholars Fellowship Award, School of Medicine Greenville

STUDENT RESEARCH  
SYMPOSIUM

# Christian Cormas, BS

## Session 1 Abstract 4



### Authors

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### Affiliations

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### Mentor

Suzanne R. Fanning, DO

## Adherence to Evidence-Based Guidelines for Acute Myeloid Leukemia: A Retrospective Chart Review for Quality Improvement



STUDENT RESEARCH  
SYMPOSIUM

### Background/Purpose

Acute myeloid leukemia (AML) is a severe hematologic malignancy characterized by diverse genetic alterations that are critical to patient management, risk-stratification, transplant eligibility, and prognostic evaluation. National guidelines recommend comprehensive genetic and molecular profiling at diagnosis to guide treatment and optimize outcomes. Evaluating Prisma Health's adherence to these recommendations and associated outcomes will identify gaps in care and promote standardized treatment. The primary aim of this study is to evaluate Prisma Health's adherence to national AML guidelines regarding genetic and molecular profiling and guided therapy. Secondary objectives include assessing treatment and transplant outcomes compared to national benchmarks.

### Methods

Retrospective analysis will be conducted on AML patients aged 18 to 70 years who received diagnostic studies or treatment through Prisma Health between January 1, 2018, and December 31, 2022. Parameters include demographics, diagnostic variables, genetic and molecular profiles, treatments, transplants, and clinical outcomes. Statistical analysis will assess trends in profiling completion, treatment decisions, transplant interventions, and clinical outcomes. Findings will be benchmarked against national averages to direct quality improvement initiatives.

### Results

The preliminary assessment identified a cohort of "n" qualifying patients. The proportion who received genetic and molecular profiling will be evaluated, and mutations with the highest frequency will be summarized. First-line therapy decisions will be evaluated under national guidelines. Transplantation rates will be recorded and classified by donor type. Post-transplant outcomes will be assessed at days 100 and 365 and expressed as the proportions of patients alive in remission, alive in relapse, or deceased. Overall relapse and mortality rates will be analyzed, with mortality being further classified by cause.

### Conclusions

Implementation of genetic and molecular profiling is vital to guiding patient-specific interventions in AML treatment. Evaluating adherence to national guidelines and corresponding patient outcomes provides insight into current management practices and identifies opportunities for improving care.

Student research funding was provided by  
Scholars Fellowship Award, School of Medicine Greenville

# William Corns, BS

Session 2  
Abstract 83



## Authors

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## Mentor

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## Robotic Assisted vs Mechanical TKA in Patients with Smart Knee Implants



### Background/Purpose

With approximately 900,000 total knee replacements performed each year in the US, some patient dissatisfaction is to be expected. 11-18% of patients express dissatisfaction with their prosthetic knee. Studies have examined reducing suboptimal outcomes by implementing robotic assistance. Proponents note reduced soft tissue damage and malalignment with the implementation of robotic aid. In terms of gauging outcomes after TKA, commonly employed methods include PROMs. However, PROMs are subject to expectation bias. A smart knee implant accounts for the pitfalls of PROMs. Ultimately, objective continuous kinematic data would provide a more thorough assessment of TKA recovery trajectory. This study will assess whether robotic assistance leads to superior biomechanical function and patient-reported outcomes compared to mechanical TKA, using both smart implant data and PROMs.

### Methods

210 patients undergoing primary TKA will be divided equally into three groups: ROSA-raTKA, TMINI-raTKA, and mTKA. All participants will receive a smart implant. Baseline data will include comorbidities, demographics, age, sex, BMI, and PROMs. Postoperatively, continuous functional data (step count, walking speed, stride length, cadence, tibial ROM, functional ROM, and distance moved) will be collected for 12 months. PROMs will be readministered at follow-up. Statistical analysis will include linear mixed-effects modeling for repeated measures, propensity score matching to control for confounders, and other appropriate tests.

### Results

We hypothesize that the robotic-assisted TKA groups will demonstrate superior functional recovery and patient satisfaction. Secondary analyses will compare ROSA-raTKA and TMINI-raTKA. Exploratory outcomes include time to independent ambulation, opioid/analgesic consumption, requirement for ligament release(s), and joint awareness.

### Conclusions

TKA is a high-volume procedure that will only increase in frequency. This study will evaluate whether robotic-assisted techniques improve functional recovery and patient satisfaction compared to mechanical instrumentation, using both subjective and objective outcome measures. These results may support the incorporation of robotic assistance in future TKA standard of care.

Student research funding was provided by  
Scholars Fellowship Award, School of Medicine Greenville

STUDENT RESEARCH  
SYMPOSIUM

# Emiliano Costilla, MS-3

Session 2  
Abstract 105



## Authors

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## Mentor

Mirinda Gormley



## Global Trends in Prehospital Antibiotic Administration, a Systematic Review

### Background/Purpose

The prevalence of prehospital antibiotic administration (PHAA) for sepsis and open fractures is growing, but protocol characteristics and effectiveness measures vary significantly by region. Our goal was to summarize characteristics of PHAA protocols, identify common outcomes, and assess the effectiveness of PHAA on patient-level and operational-level outcomes.

### Methods

We queried four databases through June 1, 2025. We included articles in English that examined the association between an operational or patient-level outcome and PHAA. We excluded military studies. Two authors performed quality assessment. Two separate authors performed data extraction using a standardized spreadsheet for operational data, protocol characteristics, patient-level outcomes and operational-level outcomes. We addressed all data discrepancies through discussion. We quantitatively evaluated protocol characteristics and qualitatively summarized outcomes. Our methods followed the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guidelines. PROSPERO registration was confirmed on 7/8/2025 (CRD420251089632).

### Results

Of 9,486 articles identified, investigators reviewed 8,411 titles, yielding 19 articles. Most studies were retrospective (52.6%) or observational (26.3%). Most PHAA research is on sepsis (84.2%) and comes from Europe (47.4%), the U.S./Canada (36.8%), and Australia/New Zealand (15.8%). Ceftriaxone (68.4%) was the most common antibiotic; prehospital antibiotics were administered by a mixture of paramedics, physicians, and nurses. Common clinical outcomes included 30-day mortality (52.6%), intensive care unit (ICU) admission (26.3%), ICU length of stay (LOS) (26.3%), and hospital LOS (31.6%). Common operational outcomes included time to antibiotics (36.8%), blood culture contamination (36.8%), and protocol adherence (26.3%). Heterogeneity in PHAA protocols, EMS staff, and populations precluded meta-analysis.

### Conclusions

PHAA programs are prevalent throughout the world, and most studies show a trend toward clinical benefit. Heterogeneity precludes a meta-analysis. Our findings are further limited by publication bias. The formulation of evidence-based PHAA guidelines requires robust multi-disciplinary research, and consensus on operational protocols and clinical efficacy.

# Logan Cripe, BS

Session 1  
Abstract 112



## Authors

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## Mentor

Helen Kaiser, PhD

## Patterns of Resilience in Medical Students



### Background/Purpose

Medical students experience high rates of anxiety, depression, burnout, and maladaptive coping early in training. Resilience, a protective factor tied to lower burnout and improved well-being, is consistently lower in medical students than the general population. Using Resiliency Theory, this study examined two domains: reintegration of biopsychosocial disruptions and internal sources of resilient energy. We sought to identify themes within these domains through student interviews and explore their relationship to resilience scores.

### Methods

This mixed-methods study used CD-RISC-25 to assess resilience in third-year medical students. A total of 110 students were invited via newsletter, Discord, and text. Participants could opt into a one-hour semi-structured interview exploring themes related to study techniques, lifestyle, values, and social support. Three independent researchers coded responses to identify themes, then collaborated to create overarching categories. Themes were scored using a 3-point Likert scale. Cohen's Kappa was calculated for interrater reliability. ANOVA tested differences in resilience across quartiles.

### Results

The average CD-RISC-25 score was 72.2, lower than the U.S. population average of 79.0. 16 students completed interviews. Emerging dichotomous themes included structured vs. free-flow organization. Individual trait themes included viewing medical school as job and spirituality. ANOVA revealed no statistically significant differences across resilience quartiles ( $p = .187$ ,  $p = .294$ ,  $p = .208$ ). Interrater reliability across themes was moderate ( $\kappa = 0.50-0.64$ ). Descriptively, higher-resilience students reported more structured organization, stronger boundaries, and more frequent references to spirituality.

### Conclusions

Preliminary data suggests that mindsets such as structured organization, boundary setting, and spirituality may support resilience in medical students. Further thematic analysis is ongoing. Identifying mindsets related to higher resilience could inform medical school interventions that support student mental health and resilience.

Student research funding was provided by

ASPIREinG Grant Funding

STUDENT RESEARCH  
SYMPOSIUM

# Molly Crosswell, MEd

## Oral Presentation Abstract 45



### Authors

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### Mentor

Erin Brackbill, MD



## Good Vibes, Healthy Lives: A Community-Based Lifestyle Medicine Curriculum for School-Aged Children

### Background/Purpose

No information available.

### Methods

We designed a 6-module curriculum rooted in the pillars of lifestyle medicine. Each module takes approximately 30 minutes to present and includes a facilitator training guide, slide deck, student handout, and caregiver resources. We partnered with schools and community organizations to pilot this curriculum. IRB approval was obtained, and student and facilitator feedback was collected through post-lesson surveys to assess engagement, usability, and impact.

### Results

The curriculum was piloted at 3 summer school programs from June 2025 to August 2025 reaching a total of 38 students, ages 7-18 years old. Students were surveyed after each lesson, and survey data shows widespread student interest, enjoyment of activity-based learning, and increased awareness of healthy choices. Facilitators found the curriculum to be easy to implement, age-appropriate and effective in promoting conversation about health choices.

### Conclusions

Good Vibes, Healthy Lives is an engaging and effective educational tool that empowers health professionals to promote healthy behaviors and target chronic disease at a young age. This curriculum has been successfully piloted in school-based programs and will be expanding to the local Children's Museum. Designed to be adaptive for different age groups and settings, this curriculum fills the need for an interactive community-based comprehensive pediatric lifestyle medicine curriculum, in addition to serving as a training opportunity for health professionals interested in lifestyle medicine.

# Austin D'Addario, MS Ambrasia Fuller, BS

Session 1  
Abstract 1



## Authors

Austin D'Addario, MS; Ambrasia Fuller, BS; Lydia Roward, MD; Sarah Pirkle, MD; Emily Williams, BS; Kyle Adams, MS; Kyle Jeray, MD; JD Adams, MD

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## Mentor

Lydia Roward, MD

## 1-Year Outcomes of Operative Tibial Plateau Fractures With and Without Cruciate Ligament Injuries



### Background/Purpose

Tibial plateau fractures are commonly associated with concomitant soft-tissue injuries, post-traumatic arthritis and malalignment. Ligamentous and menisci injury occur in 17%-57% and 39%-99% of patients, respectively. Existing literature has described fixation outcomes after tibial plateau fractures or treatment of ligamentous injuries alone, but few evaluated combined outcomes. This study investigates patient-reported outcomes following operative tibial plateau fractures, comparing cases with and without cruciate ligament injuries, to assess benefit of addressing ligament injuries.

### Methods

A single-center retrospective cohort study of patients with operative tibial plateau fractures from 2016-2024 was analyzed. Patients were stratified into fracture-only and fracture-plus-cruciate cohorts and contacted postoperatively to complete patient-reported outcomes measure (PROM) questionnaires (Lysholm, WOMAC, and PROMIS Global Health). Demographics and fracture classification (Schatzker) were recorded. Sub-analyses compared PROMs by cruciate repair status and between simple (Schatzker I-III) vs. complex (Schatzker IV-VI) fractures.

### Results

Demographics were similar among patients with and without cruciate injuries. Complex fractures occurred more with cruciate injuries, though not statistically significant ( $p = 0.10$ ). At follow-up, there were no significant differences in WOMAC (27.8 vs 27.1,  $p = 0.92$ ), Lysholm (68.1 vs 73.1,  $p = 0.40$ ), or PROMIS physical (46.9 vs 48.8,  $p = 0.44$ ). PROMs did not differ between simple and complex fracture types (WOMAC 32.1 vs 25.6,  $p = 0.32$ ; Lysholm 63.6 vs 72.2,  $p = 0.18$ ). Stabilization of cruciate ligament injuries did not improve outcomes (WOMAC 27.5 vs 28.4,  $p = 0.90$ ; Lysholm 68.7 vs 66.9,  $p = 0.80$ ).

### Conclusions

Complex tibial plateau fractures often co-occurred with cruciate ligament injuries, without reaching statistical significance. At follow-up, no significant differences in PROMs were noted. These findings suggest cruciate stabilization through operative repair may not offer clinical benefit.

# Austin D'Addario, MS

Session 2  
Abstract 25



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## Mentor

Andrew Dicks, MD

## Comparison of Vein Recanalization Following Deep Vein Thrombosis Treated with Direct Oral Anticoagulants



### Background/Purpose

Deep vein thrombosis (DVT) affects 1 individual per 1000 annually within the United States and can lead to morbidity through pulmonary embolism and post-thrombotic syndrome (PTS). Current management favors direct oral anticoagulant medications (DOAC) such as apixaban or rivaroxaban due to their safety profile, yet there has been little research on the efficacy of these drugs on their reduction of morbidity through vein recanalization and thus PTS. This study evaluates whether anticoagulant choice influences vein recanalization outcomes.

### Methods

A single-center retrospective cohort study of patients diagnosed with DVT from 2021-2024 who were prescribed apixaban or rivaroxaban were analyzed. Demographics, comorbidities, DVT location, and ultrasound findings were collected in REDCap. The primary outcome was recanalization on follow-up ultrasound (complete, partial, or none) at three months and most recent imaging. Chi-square testing was used to compare outcomes between anticoagulants.

### Results

Baseline demographics and comorbidities were similar between groups. At three months, apixaban was associated with a higher percentage of complete vein recanalization compared to rivaroxaban ( $p = 0.02$ ). No significant differences were noted between DOACs at most recent ultrasound ( $p = 0.33$ ). Pooled analysis across all time points demonstrated no statistically significant difference in vein recanalization with DOACs ( $p = 0.12$ ).

### Conclusions

Preliminary findings suggest that apixaban may be associated with higher rates of recanalization compared to rivaroxaban. These findings highlight the possible influence of anticoagulant selection on DVT resolution, while also increasing recanalization rates to reduce the morbidity associated with PTS and other long-term complications.

# Andy Davis

## Session 1 Abstract 61



### Authors

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### Mentor

Guy Benian, MD

## Map Kinase Pathway is Downstream of PAK-1 and Crucial for Integrin Adhesion Complex Assembly in Muscle



### Background/Purpose

The PIX pathway has been characterized in *C. elegans* as required for the assembly of integrin adhesion complexes (IAC) in muscle. Notably, mutations in some IAC components result in cardiomyopathy in humans. Within the PIX pathway, PIX-1 functions as a RacGEF, converting GDP-bound CED-10 (Rac) into its active GTP-bound form, while RRC-1 serves as a RacGAP, promoting CED-10 inactivation. Active CED-10 binds and activates PAK-1, stimulating its kinase activity. In parallel, ipmk-1, an inositol phosphate multikinase that converts IP<sub>3</sub> to IP<sub>4</sub>, IP<sub>4</sub> to IP<sub>5</sub>, and PIP<sub>2</sub> to PIP<sub>3</sub>, has been identified as an enhancer of the pix-1 muscle phenotype, suggesting a role for PIP lipids in IAC assembly. A central question remains: what substrates of PAK-1 promote IAC assembly, and could PAK-1 function as part of a kinase cascade? The MAPK pathway, which regulates locomotion, neural function, and reproduction in *C. elegans*, provides a compelling candidate. In mammalian tissue culture experiments, PAK kinases have been implicated upstream of MAPK signaling. In *C. elegans*, the cascade proceeds through UNC-43 (MAPKKKK), NSY-1 (MAPKKK), and SEK-1 (MAPKK), culminating in phosphorylation of PMK-1 (MAPK). Interestingly, our lab has found that sek-1 and pmk-1 mutants display muscle boundary defects similar to pix-1 mutants, suggesting a connection between these pathways.

### Methods

No information available

### Results

I investigated this potential connection. (I) First, using yeast 2-hybrid analysis, no direct interaction was detected between PAK-1 and SEK-1, though interaction cannot be excluded. (II) An ipmk-1;sek-1 double mutant exhibits the “big gap” phenotype similar to ipmk-1;pix-1. (III) This defect was recapitulated in ipmk-1 sek-1 (RNAi). (IV) ipmk-1;rrc-1 mutants compared with ipmk-1;rrc-1sek-1 (RNAi) supported a model where sek-1 acts downstream of pak-1. (V) Using anti-p38 antibodies (presumed to detect PMK-1), constitutively active pak-1 showed increased phosphorylated p38, while sek-1 null mutants showed no detectable phosphorylated p38.

### Conclusions

No information available.

Student research funding was provided by  
Scholars Fellowship Award, School of Medicine Greenville and Emory University

# Sameer Ebrahim, BS

Session 1  
Abstract 90



## Authors

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## Mentor

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## Spring Plates as a Marker of Injury Complexity in Posterior Wall Acetabular Fractures: Trends in Conversion to Total Hip Arthroplasty

### Background/Purpose

Posterior wall acetabular fractures carry high risk of post-traumatic arthritis and conversion to total hip arthroplasty (THA). Spring plates are used to buttress comminuted fragments, but their prognostic impact on outcomes is unclear. This study evaluated outcomes to assess whether spring plates function as a surrogate marker of injury complexity or are an independent predictor of joint failure.

### Methods

We retrospectively reviewed patients who underwent operative fixation for posterior wall acetabular fractures at Greenville Memorial Hospital. Patients were stratified into spring plate (SP) and no spring plate (NSP) cohorts. Data collected included: patient demographics, injury characteristics, and postoperative complications. The primary outcome was conversion to THA. Secondary outcomes included time to THA and time to decision for THA. Statistical comparisons used chi-squared/Fisher's exact and t-tests ( $\alpha = 0.05$ ).

### Results

102 patients met inclusion (34 SP, 68 NSP). Groups were comparable across baseline characteristics. THA conversion occurred in 14.7% (5/34) of SP vs. 7.4% (5/68) of NSP ( $p = 0.24$ ). Mean time to THA (206 vs. 331 days,  $p = 0.42$ ) and mean time to decision (157 vs. 280 days) were shorter for SP. Older age at index surgery was the only significant predictor of THA (45.9 vs. 35.6 years,  $p = 0.02$ ). Patients requiring THA also trended toward higher BMI (32.6 vs. 28.8,  $p = 0.13$ ).

### Conclusions

Spring plate use was consistently associated with higher and earlier THA conversion, with decisions for arthroplasty made 120 days sooner in the SP group. Although not statistically significant, this trend suggests spring plate use signals more complex, failure-prone fracture patterns rather than directly increasing risk. The only independent predictor of THA was older age at surgery. These findings highlight spring plates as both a technical solution and intraoperative prognostic marker.

Student research funding was provided by

Scholars Fellowship Award, School of Medicine Greenville, Prisma Health Department of Surgery

# Sameer Ebrahim, BS

Session 2  
Abstract 23



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## Comparison of Operative versus Non-Operative Treatment for Minimally Displaced Tibial Plateau Fractures Stratified by Schatzker Classification



### Background/Purpose

The purpose of this study was to compare patient-reported outcomes between operative and nonoperative management of tibial plateau fractures, stratified by Schatzker classification.

### Methods

A retrospective cohort study was conducted of patients aged 18–80 years with tibial plateau fractures treated between 2016–2024. Demographics, injury characteristics, and comorbidities were collected. Patients were contacted at  $\geq 1$  year follow-up for a survey consisting of WOMAC, Lysholm, Rasmussen, and PROMIS scores. Comparisons between operative and nonoperative groups were performed using chi-square and t-tests, with significance set at  $p < 0.05$ .

### Results

Forty patients were included (20 nonoperative, 20 operative). Groups were similar with respect to gender, BMI, and comorbidities. Operative patients were younger (45.5 vs. 61.9 years,  $p < 0.01$ ), and Schatzker classification differed between cohorts, with operative patients more frequently presenting with higher-energy fractures ( $p < 0.01$ ). Patient-reported outcomes showed no statistically significant differences between groups. No statistically significant differences were observed in WOMAC group ( $33.2 \pm 22.4$  vs.  $19.9 \pm 21.3$ ), Lysholm ( $65.1 \pm 22.8$  vs.  $77.2 \pm 24.0$ ,  $p = 0.11$ ), PROMIS Physical ( $45.2 \pm 9.4$  vs.  $49.8 \pm 11.2$ ,  $p = 0.16$ ), PROMIS Mental ( $49.2 \pm 10.1$  vs.  $53.7 \pm 10.4$ ,  $p = 0.17$ ), or Rasmussen scores ( $13.0 \pm 1.4$  vs.  $13.2 \pm 1.8$ ,  $p = 0.69$ ). One nonoperative patient (5%) ultimately required conversion to total knee arthroplasty six months after injury.

### Conclusions

Tibial plateau fractures are clinically significant due to their risk of post-traumatic arthritis. In this study, when controlling for injury severity by Schatzker classification, operative and nonoperative management of minimally displaced tibial plateau fractures demonstrated no statistically significant differences in functional outcomes at  $\geq 1$  year. These findings suggest that operative fixation does not provide a consistent functional advantage when controlling for injury severity. Larger multicenter studies are warranted to determine long-term results.

Student research funding was provided by

Scholars Fellowship Award, School of Medicine Greenville, Prisma Health Department of Surgery

# Evelyn Farah, BS

## Oral Presentation Abstract 19



### Authors

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### Mentor

Anna Blenda, Ph.D

## CircRNA Profiles Reveal Race Specific Biomarkers in African American Breast Cancer Patients



### Background/Purpose

African American women have higher breast cancer mortality and are more frequently diagnosed with aggressive subtypes compared to other racial and ethnic groups. Despite advances in cancer genomics, the absence of population-specific diagnostics contributes to persistent disparities in clinical outcomes. Circular RNAs (circRNAs) are stable non-coding RNAs that show promise as non-invasive cancer biomarkers. This study uses long-read circRNA sequencing and differential expression analysis to identify tumor-associated circRNAs in African American breast cancer patients.

### Methods

Serum samples from 35 African American breast cancer patients and 15 healthy female controls were obtained from the Prisma Health Biorepository. After RNA isolation and circRNA enrichment, full-length libraries were prepared using circFL-seq and sequenced with Oxford Nanopore long-read technology. Reads were basecalled, trimmed, and aligned to the GRCh38 reference genome. Differential expression analysis with edgeR identified tumor-associated circRNAs. Expression profiles were compared to European ancestry datasets to assess race-associated differences.

### Results

Differential expression analysis identified 11 circRNAs by race, 27 by tumor status, and 4 with race-tumor interaction, suggesting race-related differences in breast cancer biology. CircRNAs from REG3A and REG1A, secreted lectins involved in inflammation and immune modulation, were upregulated in African American breast tumors and are linked to tumor progression and immune evasion. CircRNAs from CTNNA2, a cell adhesion gene, showed increased expression, suggesting a potential regulatory response. The long noncoding RNA AC011754.1 was also differentially expressed and may influence tumor regulation.

### Conclusions

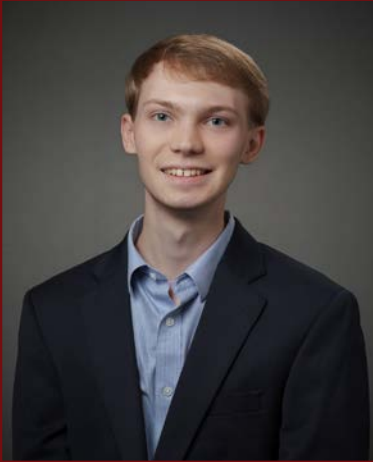
This study identifies a race-specific circRNA expression profile in African American breast cancer patients, with circRNAs from REG1A, REG3A, CTNNA2, and AC011754.1 potentially influencing tumor behavior and serving as biomarkers for race-conscious diagnostics and treatments. Acting as microRNA sponges, circRNAs modulate genes involved in proliferation, invasion, and immune response. These findings reveal a critical gap in cancer genomics and highlight the need for race-informed data to ensure equity in precision oncology.

Student research funding was provided by

ASPIREinG Grant Funding

# Grayson Fletcher, BS

Session 1  
Abstract 69



## Authors

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## Affiliations

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## Mentor

William E. Roudebush, PhD



## PAF Enhances Intracellular Calcium Release and Motility in Sea Urchin Spermatozoa

### Background/Purpose

Infertility affects millions worldwide, and many cases are linked to sperm dysfunction. Elucidating the molecular signals that regulate sperm physiology is crucial for advancing fertility treatments and reproductive biology. Platelet-activating factor (PAF) is a bioactive phospholipid originally described in inflammation, vasodilation, and platelet aggregation, but it also modulates reproductive processes. In mammals, PAF promotes sperm capacitation—a calcium-dependent event that enhances motility. Sea urchins (*Lytechinus variegatus*), a classic fertilization model, produce PAF endogenously, yet the mechanisms by which PAF influences sperm function remain poorly defined.

### Methods

Adult *L. variegatus* were induced to spawn via intracoelomic KCl injection. Sperm motility was quantified before and after exogenous PAF ( $10^{-10}$  M) treatment using computer-assisted sperm analysis. For calcium imaging, sperm were loaded with Fluo-4 AM and fluorescence was recorded with an epifluorescence microscope before and after PAF exposure. Lyso-PAF, an inactive analogue, was included as a control. Relative fluorescence units (RFU) were quantified using a Python-based workflow, and paired t-tests were performed.

### Results

PAF significantly increased sperm motility (mean SMI = 71) compared to control (mean SMI = 47;  $p < 0.05$ ). Intracellular calcium levels were also elevated following PAF treatment (control 14.57 RFU vs. PAF 17.77 RFU;  $p < 0.05$ ). Lyso-PAF showed no effect.

### Conclusions

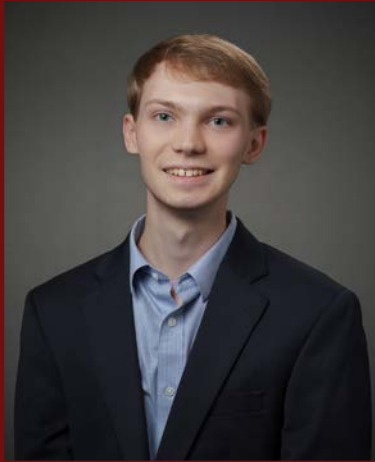
This study validates PAF as a positive mediator of spermatozoa motility, most likely via an increase in intracellular calcium. Insight into a potential mechanism by which PAF exerts its effects via intracellular calcium release may lead to identification of cell-surface PAF receptors coupled to Gq protein alpha subunits on spermatozoa of the sea urchin. Additional studies are warranted to further understand the cause-and-effect relationship between PAF and intracellular calcium on spermatozoa motility.

Student research funding was provided by  
Scholars Fellowship Award, School of Medicine Greenville

STUDENT RESEARCH  
SYMPOSIUM

# Grayson Fletcher, BS

Session 2  
Abstract 56



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## Mentor

John R. Absher, MD

## Interarial changes in white matter connections defined by DTI Tractography characterize motor symptoms in Parkinson's Disease



### Background/Purpose

Parkinson's Disease (PD) ranks second in prevalence among neurodegenerative disorders, affecting 151 individuals per 100,000 worldwide. PD pathogenesis involves dopaminergic neuron loss leading to impairment of motor function, however the mechanisms of disease pathogenesis and spread are uncertain. Motor symptoms and clinical course can vary widely among PD patients, and classification into "motor subtypes" may have value toward prognosis and individualization of treatment. Furthermore, structural differences in the brain may distinguish subtypes from one another, as evidenced by previous work. This study investigates variations in brain connectivity using diffusion tensor imaging (DTI) and attempts to identify connectivity variations that may correlate with specific motor symptoms.

### Methods

High-quality DTI data available from the Parkinson Progression Marker Initiative (PPMI) was retrieved for 225 PD subjects. DSI Studio was used to create tractographs and generate fractional anisotropy (FA) and mean diffusivity (MD) metrics for 61 pre-selected white matter tracts. Removal of low-quality outliers and patients with missing data yielded a usable set of 145 PD subjects and 39 tracts. Using R Studio 4.4.1, sex-stratified correlation matrices were then constructed associating MSD-UPDRS symptom scores with brain regions. Logistic regression models were generated using 80% of the data for model training and 20% for model evaluation, with each model resampled 10 times. Density plots and confusion matrices were constructed to evaluate models.

### Results

15 models (14 female, 1 male) passed the retention criteria of  $\geq 7$  severe cases and  $\geq 2$  correlated brain regions. Ongoing work is focused on comparing model performance across symptoms and identifying trends.

### Conclusions

Early-stage findings indicate that connectivity within certain brain regions correlates strongly with specific motor symptoms. Results also suggest sex differences. Further investigation is needed to compare brain region connectivity across PD motor subtypes with attention to sex differences.

Student research funding was provided by  
Brain Health Network

STUDENT RESEARCH  
SYMPOSIUM

# Kelly Forrester

Session 2  
Abstract 59



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## Mentor

Jennifer Grier, PhD

## Investigating the Role of IFI35 in Cell Viability during Viral Infection Conditions



### Background/Purpose

Widespread immune responses induced by viral infection with clinically significant viruses such as Respiratory Syncytial Virus or SARS-CoV-2 have the potential to be both protective and pathogenic. Interferon-induced protein 35 (IFI35) is highly up regulated during the antiviral interferon response and has been shown to modulate the host immune response, however, the specific impact and mechanisms by which IFI35 acts remains unclear. We sought to investigate the effect of IFI35 on lung epithelial cell viability under viral infection conditions.

### Methods

Two novel IFI35 knock out (IFI35KO) cell lines were created in the human respiratory epithelial cell line, A549, using CRISPR-Cas9. The presence of IFI35KO mutations were confirmed on both DNA and protein levels. Wild-type A549 and IFI35KO A549 cell lines were transfected with poly I:C, a mimic of viral RNA to simulate a viral infection in the absence of viral proteins that may alter the natural host immune response. An 3-(4,5-dimethylthiazol-2-yl)-2,5-diphenyltetrazolium bromide MTT assay was then used to quantify cell viability.

### Results

IFI35KO cells displayed an increase in cell viability in relation to the wild-type A549.

### Conclusions

These findings suggest that IFI35 plays a role in cell death during a viral response. The potential contributions of IFI35 to pro-apoptotic pathways during a respiratory virus infection may be an important consideration in viral immunity. Understanding of the significance and impacts of key components of the antiviral immune response such as IFI35 can lead to effective therapeutic treatments for these infections which impact millions of patients around the world.

Student research funding was provided by  
Scholars Fellowship Award, School of Medicine Greenville

STUDENT RESEARCH  
SYMPOSIUM

# Claire Fortman

Session 2  
Abstract 73



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## Mentor

William E. Roudebush, PhD

## Platelet-Activating Factor's Effect on Intracellular Calcium Release in Two-Cell Sea Urchin Embryos



### Background/Purpose

Platelet-activating factor (PAF) is a signaling phospholipid produced by embryos to facilitate standard embryonic development and implantation. Along with PAF, calcium is required for the initiation and facilitation of developmental transitions in embryos. Previous literature has revealed that PAF and intracellular calcium are interconnected during early embryo development. This study reports enhanced induction of intracellular calcium release in response to exogenous PAF administration in sea urchin embryos at the two-cell stage.

### Methods

Gravid sea urchins were injected with KCl to induce release of gametes. In a drop of seawater, eggs and sperm were combined. Once the inseminated eggs developed a fertilization membrane, a fluorescent calcium indicator (Fluo-4) was added. Embryos were subsequently cultured to the two-cell stage. Then, they were transferred to a microscope slide, after which PAF (10<sup>-7</sup>M) was added. This addition of PAF was performed while the slide was imaged under a fluorescent microscope to observe the fluorescence of calcium release, which was recorded as relative fluorescence units (RFU). The procedure was repeated using the biologically inactive form of PAF (Lyso-PAF) as a negative control. Data was analyzed via paired t test (Sigma Plot).

### Results

A total of 16 two-cell stage embryos were utilized as described. PAF (mean= 105.92 RFU) induced a significant ( $P < 0.01$ ) rise in intracellular calcium levels over background (controls; mean= 44.5 RFU). Lyso-PAF (mean= 46.32 RFU) was not observed to induce any rise in intracellular calcium levels over background levels.

### Conclusions

These results indicate that there is increased intracellular calcium release in embryos that have been exposed to exogenous PAF in comparison to control embryos and embryos that have received Lyso-PAF. Due to the known separate actions of PAF and intracellular calcium during development combined with our findings, this demonstrates that PAF likely induces the release of intracellular calcium, facilitating the development of sea urchin embryos.

Student research funding was provided by

ASPIREinG Grant Funding

STUDENT RESEARCH  
SYMPOSIUM

# Sonia Garg, BS

# Caroline Bailey, MS

# Joel Aguilera-Flores, BS

Session 1  
Abstract 38



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Sonia Garg, BS, Caroline Bailey, MS, Joel Aguilera-Flores, BS, Cheryl Lawing, MD, Jacob Bailey, MS

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## Mentor

Cheryl Lawing, MD

## Evaluation of Tibial Torsion in the Uninvolved Side of Children with Unilateral Clubfoot



### Background/Purpose

Congenital clubfoot is a common pediatric foot deformity, most often treated with the Ponseti method, which involves serial casting and long-term bracing with a foot abduction orthosis (FAO). In unilateral cases, both feet are braced, raising concerns that the uninvolved limb may also be affected by externally rotated positioning. While treatment focuses on correcting the clubfoot, less is known about how the uninvolved limb develops over time. This study aimed to evaluate whether the uninvolved limb in children with unilateral clubfoot demonstrates measurable differences compared to typically developing children.

### Methods

A retrospective chart review and motion analysis study was conducted at Shriners Children's Greenville. Male and female patients aged 5–18 with unilateral idiopathic clubfoot who underwent motion analysis for clinical evaluation were included. Kinematic variables (hip, ankle, tibial rotation, foot progression) and physical exam findings were compared between uninvolved limbs and normative values using unpaired t-tests.

### Results

Fifty-two patients (67% male) were included. Orthoses used included solid AFOs (22%), shoe inserts (23%), and other devices. Statistically significant differences were observed in tibial rotation ( $-11.3^\circ$  vs.  $-14.5^\circ$ ,  $p=0.0337$ ), hip rotation ( $-1.2^\circ$  vs.  $1.2^\circ$ ,  $p=0.001$ ), ankle rotation ( $3.9^\circ$  vs.  $0.9^\circ$ ,  $p=0.0004$ ), knee flexion ( $-19.0^\circ$  vs.  $-16.0^\circ$ ,  $p=0.0091$ ), and hip rotation on physical exam ( $47.4^\circ$  vs.  $57.6^\circ$ ,  $p<0.0001$ ).

### Conclusions

The uninvolved limb in unilateral clubfoot patients demonstrates measurable deviations in tibial, hip, and ankle kinematics compared to normative data. These differences may reflect brace-related forces or underlying biological adaptations. Longitudinal studies are needed to determine whether these findings are treatment-related or represent inherent growth patterns. Clinical monitoring of both limbs and adjustments in brace design/protocol may help minimize unintended effects on the uninvolved side.

Student research funding was provided by  
Shriners Childrens Hospital

STUDENT RESEARCH  
SYMPOSIUM

# Kendall Gassman, BS

Session 2  
Abstract 55



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## Inspiring The Next Generation Through Implementing the Inaugural STEM Goes Red Event at a Medical School

### Background/Purpose

Women make up 35% of the STEM workforce, illustrating their underrepresentation in STEM fields. Early exposure to STEM careers and mentorship has been shown to increase students' awareness, confidence, and curiosity in STEM and their likelihood of pursuing a career in STEM. Middle school represents a critical developmental stage where one begins to form career interests, yet many lack access to meaningful STEM experiences. To address this gap, we sought to create a program to engage young women in hands-on activities led by medical students, faculty, and other community members. In December 2024, USC Greenville hosted its inaugural STEM Goes Red event in partnership with the American Heart Association (AHA). This day was designed to inspire 50 middle school girls from a Title I school to explore careers in STEM.

### Methods

Funding was secured through the AHA, with three additional years of support, allowing for longitudinal evaluation. A planning committee of medical students was formed to delegate roles and oversee logistics, including curriculum development, volunteer recruitment, and scheduling. Partnerships with faculty, the simulation center, IT, and facilities enabled the use of the medical school and its equipment. Curriculum development focused on designing lesson plans for interactive sessions. Program impact will be evaluated through pre- and post-surveys utilizing a pediatric Likert scale to assess awareness and interest in STEM careers.

### Results

We anticipate an increase in self-reported interest in STEM careers following participation in the event. Multi-year funding lends itself to longitudinal follow up to assess retention of career interest over time.

### Conclusions

This initiative demonstrates the role medical students and schools can play in inspiring the next generation of learners. Early exposure to STEM careers fosters awareness of these opportunities and the confidence to pursue them, promoting women's long-term interest and representation in the STEM workforce.

# David Chandler Gayle

Session 1  
Abstract 87



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## Mentor

John Emerson, M.D.; Cassidy Hood, M.D.

## Sex-Specific Outcomes of Lifestyle Interventions in Patients with Coronary Heart Disease: A Systematic Review with Narrative Synthesis



### Background/Purpose

Coronary heart disease (CHD) is responsible for nine million deaths each year. Although age-standardized CHD mortality has declined in high-income countries, the absolute number of deaths from CHD is increasing globally. CHD is largely preventable through lifestyle interventions, yet limited evidence exists on whether these interventions differentially affect males and females in secondary CHD prevention. This systematic review will therefore examine the outcomes of various lifestyle interventions in males and females receiving guideline-recommended pharmacotherapy for CHD.

### Methods

Outcomes of interest include sex-specific major adverse cardiovascular events (MACE) and secondary CHD risk markers such as low-density lipoprotein cholesterol (LDL-C). This review will search the MEDLINE, EMBASE, and CENTRAL databases for randomized controlled trials, cohort studies, and case-control studies reporting sex-specific outcomes of lifestyle interventions for CHD. Eligible interventions will be those endorsed by the American College of Lifestyle Medicine that address at least one of the nine factors identified by the INTERHEART study as accounting for over 90% of myocardial infarction risk. These include abnormal lipids, smoking tobacco, hypertension, and others.

### Results

MACE will include unstable angina, non-fatal myocardial infarction, non-fatal stroke, coronary revascularization, or cardiovascular death occurring in CHD patients during follow-up. Where available, LDL-C, high-density lipoprotein cholesterol (HDL-C), triglycerides, blood pressure, BMI, hemoglobin A1c, and other risk factors will be extracted for intersex comparison following intervention.

### Conclusions

A qualitative narrative synthesis of MACE and secondary risk factors will assess each lifestyle intervention with regard to its differential success at secondary CHD prevention in males and females. Risk of bias will be assessed to contextualize the results of the review. The completed review will provide critical insights into whether lifestyle interventions confer different benefits in males versus females with CHD, informing both clinical practice and guideline development.

# Jolie Guinn, BS

## Session 1 Abstract 93



### Authors

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### Mentor

Gautam Bhatia, MD

## Sternal Reconstruction via Talon Plating: Quality of Life Data



### Background/Purpose

Sternal wound infection and/or nonunion represents a source of morbidity/mortality following median sternotomy. Several closure methods exist, including conventional wire closure, anterior plating, and Talon plating. Talon plating may increase sternal stability and decrease wound dehiscence/infection following sternal reconstruction, allowing for improved quality of life in patients. Talon plating is a relatively new procedure/device, and there is a paucity of evidence surrounding outcomes following closure with Talon plates, including improving quality of life in patients with previous nonunion following sternotomy.

### Methods

A retrospective observational review of all patients who underwent Talon plating between 2016 and 2025 was performed. For our study, we included patients with sternal nonunion after cardiac surgery and excluded patients with infected wounds or mediastinitis. We used a standardized over-the-phone 36 question patient survey to determine quality of life after receiving Talon plating surgery. Data was managed using REDCap, a HIPAA compliant online database.

### Results

22 patients underwent Talon plating for sternal reconstruction at our institution. Fifteen patients were willing to participate in the patient questionnaire. Of these, 11 (73.34%) patients agreed or strongly agreed that undergoing Talon plating was the right decision. Only one patient regrets the choice to undergo surgery. Thirteen (86.67%) patients would make the same choice again (undergo Talon plating). Twelve (80%) patients disagree with the statement that the Talon plating surgery did them harm. Thirteen (86.67%) patients stated that receiving the surgery was a wise decision.

### Conclusions

Talon plating may improve sternal stability, decrease pain, and improve patient quality of life compared to no intervention. It is evident that complications following the reconstruction surgery still occur; however, it is evident from our study that patients subjectively report they are overall happy with the decision to undergo Talon plating and do not believe it did them further harm.

Student research funding was provided by

Scholars Fellowship Award, School of Medicine Greenville, Prisma Health Department of Surgery

# Greyson Holler, BS

## Session 1 Abstract 17



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### Mentor

Christine Schammel

## Caught in the Loop: Clinical Patterns and Outcomes of Pediatric Intussusception



### Background/Purpose

Pediatric ileocolonic intussusception is a leading cause of acute abdominal pain in children aged 6 months to 5 years. It occurs when a segment of bowel telescopes into an adjacent portion, causing intestinal obstruction and potentially leading to ischemia, necrosis, or perforation if not promptly managed. Diagnosis is typically made via ultrasound, and hydrostatic enema is the preferred method of non-operative reduction. Surgical intervention is reserved for failed reductions or complications. Current literature debates the influence of timing on reduction success, particularly whether earlier intervention classified as urgent (2-8 hours) or emergent (<2 hours) improves outcomes. Additionally, clinical and imaging features for successful reduction remain unclear.

### Methods

This study retrospectively reviewed pediatric intussusception cases diagnosed and/or treated at a single institution from 2016 to 2024. Demographic, clinical, and procedural data were collected from electronic medical records, including intussusception type, treatment modality, timing from diagnosis to reduction, and outcomes.

### Results

Our institution successfully reduced 81.75% of cases on the first air enema attempt. The average time between diagnosis and first reduction attempt was 1.37 hours. There was no significant difference in the timing of successful first attempt reductions and non-successful first attempt reductions ( $p=0.7104$ ). Significant predictors of an unsuccessful first attempt include age ( $p=0.0306$ ), WBC ( $p=0.0102$ ), and trapped fluid between intussuscepted loops on US ( $p=0.0091$ ).

### Conclusions

This project aims to inform institutional practices, optimize resource allocation, and enhance patient outcomes through more timely intervention and improved staffing protocols. Our results align with published success rates and timeliness and show that delayed reduction and predictors of outcome can guide more efficient resource allocation and improve patient care.

Student research funding was provided by

Scholars Fellowship Award, School of Medicine Greenville, Prisma Health Department of Radiology

# Greyson Holler, BS

Session 2  
Abstract 99



## Authors

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## Mentor

Christine Schammel

## Two Rare Acinetobacter Isolates in a Single Institution: *A. soli* and *A. seifertii*



### Background/Purpose

Acinetobacter is recognized as a nosocomial pathogen with significant implications on public health due to the outbreaks it causes worldwide. Notably, the World Health Organization designates Acinetobacter baumannii as a high priority pathogen for the research and development of antibiotics due to frequent reporting of carbapenem-resistant isolates associated with outbreaks in hospitals. In the present study, we present two rare clinical isolates, *A. soli* and *A. seifertii*, in pediatric and adult patients, respectively, identified at a single regional institution.

### Methods

We identified all Acinetobacter infections at a single institution between 2015-2020 (n=665). In 2018, 106 were identified. Two unusual species: *A. soli* and *A. seifertii* from 2018 are reported here. Retrospective evaluation of the clinical presentation, demographics and treatments were performed.

### Results

The identification of non-baumannii Acinetobacter species highlights the importance of detailed microbiologic workup in atypical infections.

### Conclusions

These cases emphasize the importance of microbiologic surveillance in diverse patient populations and support for tailored treatment based on susceptibility profiles. Continuing studies looking at genetic relatedness between species and acquisition of multi-drug resistance.

STUDENT RESEARCH  
SYMPOSIUM

Student research funding was provided by  
Scholars Fellowship Award, School of Medicine Greenville

# Liza Hopper, BS

## Session 1 Abstract 13



### Authors

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### Mentor

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## Baroreflex Activation Therapy (BAT) as an Adjunct for Proactive Heart Failure Management

### Background/Purpose

Each year, physicians treat millions of patients in the United States who suffer from chronic heart failure (HF). Many patients with HF have ambulatory monitoring devices, including Abbott CardioMEMS, Endotronic Cordella, Boston Scientific HeartLogic, and Medtronic TriageHF, which have been shown to predict and prevent HF hospitalizations. These remote patient monitoring (RPM) devices deliver healthcare providers with real-time data for patients outside of traditional healthcare settings. The CVRx Barostim Neo device is a small, implantable device that sends electrical signals to the carotid artery in the neck, activating the body's natural pressure sensors (baroreceptors). This activation helps to rebalance the autonomic nervous system, which is overactive in heart failure to improve quality of life in patients with chronic heart failure with reduced ejection fraction (HFrEF). To date, data has not yet been collected on the impact of BAT in patients with RPM devices. The purpose of this retrospective study is to better understand the mechanism of BAT and potentially identify patients that would benefit from advanced heart failure therapies.

### Methods

Eighteen patient records were reviewed using manual chart abstraction within the EPIC electronic health record system. Data were collected at three time points: 6–12 months prior to BAT implantation, at the time of implantation, and 6–12 months post-implantation. The dataset includes comprehensive demographic, imaging, laboratory, and device-derived metrics from RPM devices, including CardioMEMS, Cordella, and ICD/CRT-D systems with HeartLogic and TriageHF capability. Statistical analyses will be performed to evaluate changes in clinical parameters and device readings over time.

### Results

The hypothesis is that BAT will improve baseline physiological measures as well as RPM readings over time. With data analysis ongoing, the results of this study are still pending.

### Conclusions

The results of this retrospective study will advance our understanding of the effect of baroreceptor activation on clinical and RPM measurements.

Student research funding was provided by  
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# Sydney Jarecki, MD Candidate

Session 1  
Abstract 10



## Authors

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## Mentor

Erin Weeda, PharmD

## Association Between Polypharmacy and Medication Adherence: A Meta Analysis



### Background/Purpose

Medication nonadherence is a growing concern for both the patient and healthcare system. Non-adherence to medications is associated with poor disease control, increased healthcare costs, frequent hospital admissions, and higher mortality rates. Many factors, including age, socioeconomic status, and diagnosis, could play a key role in the patient's ability to adhere to their treatment plans. One factor that has been proposed to impact medication adherence is polypharmacy; however, the relationship between polypharmacy and medication adherence has not been systematically summarized. We aimed to perform a meta-analysis to summarize real-world medication adherence in polypharmacy versus non-polypharmacy groups.

### Methods

A systematic search of Ovid Medline, Scopus, and Embase was conducted and imported into Covidence. To meet the inclusion criteria, real-world articles had to be published in the full-text form and directly compare medication adherence in polypharmacy to a reference non-polypharmacy cohort. Only studies using adherence via proportion of days covered (PDC), with a PDC cutoff of 80% for dichotomous adherence, were included. Non-adherence, defined as the proportion of patients with a PDC<80%, was the primary outcome.

### Results

A total of 8 studies evaluating 30,834 polypharmacy and 81,423 non-polypharmacy patients were included in the meta-analysis. The studies captured data spanning from 2014 to 2023. Of the polypharmacy patients, 17,727 showed nonadherence (57.7%) versus the 43,155 non-polypharmacy patients showing nonadherence (53.0%). Upon meta-analysis, there was no significant difference in medication adherence among patients experiencing polypharmacy and non-polypharmacy across included studies (Risk Ratio = 1.03 (95%Confidence Interval=0.74-1.43; I<sup>2</sup> = 98.8%).

### Conclusions

There was no difference in medication adherence in polypharmacy versus non-polypharmacy treatment regimens. These findings suggest that other factors may play a more important role in medication adherence among patients. Further studies are needed to investigate such factors.

Student research funding was provided by  
Scholars Fellowship Award, School of Medicine Greenville

STUDENT RESEARCH  
SYMPOSIUM

# Conner E. Johnson, MEng

Session 1  
Abstract 53



## Authors

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## Mentor

Erin R. Weeda, PharmD



## In-Hospital Outcomes Among Patients Admitted for Myocardial Infarction with Coexisting RSV vs Influenza Infections

### Background/Purpose

Among patients with myocardial infarction, influenza infection increases the risk of severe complications and mortality, likely driven by combined inflammatory and cardiovascular stress. Little is known about coexisting respiratory syncytial virus (RSV) infection among those presenting with myocardial infarction. This study aimed to investigate whether in-hospital outcomes differ among patients admitted for myocardial infarction with coexisting RSV versus influenza infections.

### Methods

Using the 2016-2022 United States National Inpatient Sample, we identified all individuals admitted for myocardial infarction. Only those with coexisting RSV or influenza infections were included. In-hospital outcomes were compared among those with RSV versus influenza.

### Results

We identified 3,966 patients with myocardial infarction in the database for inclusion in our study, of which 565 had coexisting RSV and 3,401 had coexisting influenza infections. In-hospital mortality occurred in 5.7% of individuals with RSV and 5.8% of individuals with influenza infections ( $p=0.45$ ). The average length of hospital stay in all patients was approximately 7 days for both those with RSV and those with influenza. After adjusting for covariates, there was no difference in mortality or length of stay between cohorts ( $p>0.05$  for both).

### Conclusions

This study found no significant difference in in-hospital mortality or length of stay between patients with myocardial infarction coexisting with RSV versus influenza infections. Given the established role of influenza in exacerbating myocardial infarction severity, greater recognition and investigation of RSV co-infections in this high-risk population is likely needed.

# Sydney Keane, BS

Session 1  
Abstract 29



## Authors

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## Mentor

Melissa Hite, MD

## Disparities in Diagnosis and Treatment of Anal Cancer



### Background/Purpose

Anal squamous cell carcinoma is rare but highly treatable; however, incidence and mortality are rising worldwide. Diagnosis often relies on symptoms such as rectal bleeding or pain, but these are frequently missed without a thorough anorectal exam. Over half of patients are initially misdiagnosed, and up to 27% are diagnosed with hemorrhoids instead. Provider education and patient awareness are critical. Delays in diagnosis, whether from late presentation or misdiagnosis, may worsen outcomes. We aim to characterize the clinical timeline from symptom onset to diagnosis and evaluate outcomes in our patient population, hypothesizing that misdiagnosis and delayed referrals contribute to later-stage presentations. We also predict disparities within patient demographics may influence these delays.

### Methods

A retrospective cohort study was conducted on 168 adults with anal squamous cell carcinoma, with 121 meeting inclusion criteria, with diagnosis between 2016–2023. Data included symptom onset, provider type, anorectal exam timing, referral to colorectal surgery, stage at diagnosis, and demographics.

### Results

Preliminary analysis showed a mean age at diagnosis of 63 years, with 72% female. The cohort was 74% white and 23% Black; 53% were covered by Medicare. Most patients (52%) reported symptoms first to primary care, with anal pain (83%), rectal bleeding (66%), and anal mass (44%) most common. While 63% were referred to specialists, 42% lacked a documented anorectal exam prior to colorectal surgery referral. Common referral diagnoses included anal lesion/mass, pain, cancer, and hemorrhoids. At diagnosis, 38% had stage II disease.

### Conclusions

Early findings suggest delays in diagnosis stem from initial misdiagnosis and absent anorectal exams. Ongoing analysis will assess how these delays affect staging, treatment, and disparities in care.

Student research funding was provided by  
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STUDENT RESEARCH  
SYMPOSIUM

# Nabeeha Khan

Session 2  
Abstract 84



## Authors

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## Mentor

Dr. Brian Jones

## Robotic Left Renal Vein Transposition



### Background/Purpose

Pelvic congestion syndrome is a medical condition with chronic pelvic pain that can be caused by pelvic venous engorgement from gonadal vein obstruction, renal vein obstruction, ileocaaval obstruction, or venous reflux. This syndrome is common in the 2nd or 3rd decade of life in multiparous females. The pain can present as dull, achy and cause dyspareunia, dysuria, or dysmenorrhea.

### Methods

We report a novel surgical technique of posterior nutcracker syndrome utilizing minimally invasive, robotic technique on a 27-year-old female with a several year history of recurrent abdominal pain and flank pain. Trocars were placed in the abdomen to visualize the renal anatomy.

### Results

Therefore, it is possible to perform robotic-assisted LRV transposition even if in a posterior location safely.

### Conclusions

To our knowledge, this is the first report of robotic-assisted posterior LRV transposition (J Vasc Surg Venous Lymphat Disord. 2015 Jan;3(1):96-106.)

STUDENT RESEARCH  
SYMPOSIUM

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# Cooper Kuess, MS

Oral Presentation  
Abstract 96



## Authors

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## Affiliations

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## Mentor

Meenu Jindal, MD

## The Effect of Social Drivers of Health on HgbA1c Reduction in the Wellness and Empowerment for Women Program at Prisma Health in Greenville, South Carolina\_



### Background/Purpose

The presence of diabetes during pregnancy predisposes women to future risk of diabetes and poor outcomes. Patients with maternal and gestational diabetes face barriers to post-partum primary care and diabetes management. The Wellness and Empowerment for Women (WOW) program at Prisma Health is a project of Diabetes Free South Carolina, funded by the BlueCross BlueShield of South Carolina. WOW serves to address women's health by improving access to post-partum primary care for women with diabetes or history of gestational diabetes. The WOW team assesses social drivers of health (SDOH) and strives to address them by providing transportation to appointments, produce boxes, and financial counseling. These social drivers of health are barriers to care for patients with diabetes. This abstract is focused on impact of patients' insurance status, transportation access, educational attainment, and English proficiency on changes in hgbA1c.\_\_\_\_

### Methods

We performed univariate and multivariate logistical regression analysis for 77 patients with the diagnosis of type I, type II or gestational diabetes, with baseline and 12-month hgbA1c measurements.\_

### Results

Our results indicated no difference in reduction in hgbA1c across our patient population based on insurance status (p-values of 0.91 and 0.94 respectively), transportation access (p-value of 0.77), education level (p-values of 0.37 and 0.73 respectively) and English proficiency (p-values of 0.41 and 0.35 respectively). Additional analysis on the patients with type I or type II diabetes (excluding patients with gestational diabetes) also indicated an improvement in hgbA1c overall (p-value 0.002) and no impact of social drivers of health on hgbA1c reduction.\_\_

### Conclusions

In conclusion, this work indicates overall significant hgbA1c improvement at 12 months and no impact of social drivers of health on hgbA1c reduction. These findings are encouraging as the WOW program promises to provide primary care and diabetes management to a diverse group of patients while addressing identified socioeconomic and other barriers.

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Scholars Fellowship Award, School of Medicine Greenville

STUDENT RESEARCH  
SYMPOSIUM

# Spencer Loehr, BS

Session 2  
Abstract 22



## Authors

Spencer Loehr; Kelsi Marts; Wilson Maddox; Dr. Patrick Springhart; Dr. Patrick Hochrein

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## Mentor

Patrick Springhart, MD; Patrick Hochrein, PhD



## Comparing Variability in Time-Based vs. Interpersonal Metrics to Guide MRI Patient Satisfaction Interventions

### Background/Purpose

Patient satisfaction in imaging facilities relies heavily on workflow efficiency and clear communication. To guide targeted improvements, this study uses baseline Nation Research Corporation (NRC) data to compare variability between time-based metrics (test or procedure began on time, etc.) and interpersonal satisfaction metrics (staff listened, comfort talking with nurses, etc.). By identifying which domain contributes more strongly to dissatisfaction, we can better design appropriate interventions. Analysis of NRC patient satisfaction data from May 2025 revealed that time-based metrics such as "Appointment as soon as needed" ranged from 59.6% to 83.7% (range: 24.1%) while interpersonal metrics, such as "Staff listened" ranged from 83.9% to 96.5% (range: 12.6%). This highlighted greater variable inconsistency in system-related factors compared to communication-based ones. Because these findings suggested that long and variable wait times were a major driver of dissatisfaction, we implemented a pre-appointment screener aimed at improving workflow consistency and patient understanding. This analysis establishes baseline variability patterns that our intervention seeks to address.

### Methods

This prospective, single-site study was conducted at the Patewood Prisma Health MRI facility. The primary intervention was the introduction of a patient screener who contacted patients one week prior to their exam to clarify logistics, answer questions, and prepare them for the experience. Along with this, they are ensuring patients are safely able to obtain an MRI. ActExcell software was used to measure median time from patient arrival to scan start and total MRI exam duration across April–July of 2024 (pre-intervention) and April–July of 2025 (post-intervention).

### Results

Median arrival-to-exam start time decreased from 26:07 pre-intervention to 20:00 post-intervention, reflecting improved workflow efficiency. Median MRI exam duration slightly increased from 49 to 51 minutes, suggesting that reduced waiting times did not negatively impact scan quality or preparation.

### Conclusions

Time-based metrics showed the most variability in baseline NRC data, making them the main driver of dissatisfaction. After introducing the screener, median arrival-to-start times dropped by over six minutes, while exam duration rose slightly but without a measurable effect on throughput or care quality-supporting its clinical insignificance. While improvement in wait times aligns with the screener's goal, other factors, such as concurrent workflow adjustments, staffing patterns, or patient educational materials, may also have contributed to the observed changes. These results suggest that a patient screener can improve workflow efficiency primarily between a patient's arrival and exam initiation and help narrow the gap between time-based and interpersonal satisfaction scores.

Student research funding was provided by  
Scholars Fellowship Award, School of Medicine Greenville

# Lawson Logue, BS

Session 2  
Abstract 68



## Authors

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## Mentor

Yuliya Yurko, MD

## Outcomes of CT-Guided Pudendal Nerve Cryoablation for Pudendal Neuralgia



### Background/Purpose

Pudendal neuralgia is a chronic pelvic and perineal pain syndrome originating from damage, injury, inflammation, or irritation of the pudendal nerve. It is a common cause of chronic perineal pain and significantly impairs quality of life. Pudendal neuralgia is often unrecognized, and the actual incidence is unknown. However, the International Pudendal Neuropathy Association estimates an incidence of 1 in 100,000 within the general population. Early, stepwise treatment is associated with better outcomes. Imaging-guided pudendal nerve blocks are effective but not durable. Patients who gain temporary relief from nerve blocks may have a positive and durable response to CT-guided cryoablation; however, literature regarding outcomes is scarce. This study aims to describe outcomes following CT-guided pudendal nerve cryoablation.

### Methods

We retrospectively analyzed patients who underwent CT-guided pudendal nerve cryoablation between November 2018 and November 2024. Manual chart review was performed to assess demographics, pain history, and relevant clinical factors. Patients were contacted for a voluntary follow-up telephone questionnaire assessing pain levels, procedure outcomes, alternative pain management modalities, and decision satisfaction. The Decision Regret Scale was used to assess post-procedure regret.

### Results

Nineteen patients underwent CT-guided cryoablation; 15 met eligibility criteria, and 7 (3 males and 4 females) completed the follow-up telephone questionnaire. None reported complete pain resolution following the procedure. The mean current pain score was  $6.22 \pm 2.69$ . All participants indicated they did not regret undergoing the procedure and believed it caused no harm. Responses regarding willingness to repeat the procedure were mixed: Strongly agree (14.3%), Agree (28.6%), Neutral (28.6%), Disagree (14.3%), Strongly disagree (14.3%).

### Conclusions

While no patients reported complete pain relief following CT-guided pudendal nerve cryoablation, all expressed satisfaction with their decision to undergo the procedure. These findings contrast with other studies suggesting more substantial benefit of pudendal cryoablation for pain improvement. Future studies should assess pre- and post-procedure pain to better determine the efficacy of CT-guided cryoablation for pudendal neuralgia.

Student research funding was provided by

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STUDENT RESEARCH  
SYMPOSIUM

# Noelle Luzzi, BS

Session 1  
Abstract 57



## Authors

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## Mentor

Christine Schammel



## Intrapulmonary Neurofibromas in the Absence of Confirmed Neurofibromatosis: A Diagnostic Challenge with a Proposed Algorithm

### Background/Purpose

Neurofibromas are benign peripheral nerve sheath tumors that commonly arise in individuals with neurofibromatosis type 1 (NF-1), a genetic disorder typically diagnosed in childhood. Though neurofibromas most frequently present as cutaneous or subcutaneous lesions, rare occurrences within the pulmonary parenchyma can pose a significant diagnostic challenge—particularly in patients without confirmed NF-1.

### Methods

We present the case of a 52-year-old asymptomatic male who was referred to surgical oncology after routine lung cancer screening revealed progressive, multifocal pulmonary nodules. Initial core needle biopsy revealed a minute focus of bland spindle cells with abundant myxoid material but lacked sufficient material for definitive diagnosis. Subsequent surgical wedge resection and immunohistochemical analysis identified diffuse intrapulmonary neurofibromas. This case underscores the diagnostic challenges posed by myxoid lesions of the lung, particularly when incidentally discovered and lacking classic features of NF-1.

### Results

Given the lesion's multifocality, the patient was appropriately managed with targeted resection followed by observation—an approach aligned with expert recommendations for diffuse pulmonary neurofibromas when complete excision is not feasible. To aid in the diagnostic process, we propose a structured algorithm for evaluating myxoid pulmonary neoplasms, which often demonstrate overlapping histologic and cytologic characteristics.

### Conclusions

As sporadic intrapulmonary neurofibromas are exceedingly rare, this case adds to the limited literature and reinforces the need to include neurofibroma in the differential diagnosis of multifocal lung nodules, even in patients without confirmed NF-1.

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Scholars Fellowship Award, School of Medicine Greenville

STUDENT RESEARCH  
SYMPOSIUM

# Wilson Maddox

Session 1  
Abstract 36



## Authors

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## Affiliations

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## Mentor

Patrick Springhart, MD



## Evaluating The Impact of Patient Education on MRI Key Performance Indicators

### Background/Purpose

Patient satisfaction scores are an important metric that healthcare entities collect and aim to improve upon. One aspect of this is patient comprehension, whether they understand the procedure that they are about to undergo. In the context of MRI screenings, this could play a big role in the efficiency of the scan, as increased understanding can lead to improved patient compliance, ultimately resulting in improved patient satisfaction. The main aim of this study is to ascertain if the implementation of an MRI screener and educational materials provided to patients at a single MRI facility in July 2025 statistically improves patient satisfaction key performance indicators (KPIs) compared to May 2025. Specifically, the patient's understanding of the procedure was measured by a yes/no response to the question "What questions do you have about today's test or procedure"? This is a two-phase study, consisting of a pre and post interventional study conducted at a single MRI facility. The first phase implements a single intervention, while the second phase will implement the first intervention and an additional intervention.

### Methods

This study involved several patient-centered interventions implemented to improve the MRI experience. The primary intervention was the introduction of a patient screener who called patients one week before their MRI appointment to conduct a pre-screening. Additional interventions that are to be included in the future are the distribution of educational materials to patients undergoing screening. These materials consisted of short educational videos and informational posters. The posters, which explain how the MRI machine and scanning process work, will be displayed in the MRI preparation room so that patients can view them while getting ready for their scan. Patient response data were manually collected by the MRI manager using a set of standardized binary (yes/no) questions that were termed cipher rounds. This data collection occurred in two-time intervals in May 2025, before the interventions were implemented, and again in July 2025, after the screener and educational materials were in place. A single interviewer asked patients these questions and recorded their responses to evaluate the impact of the interventions

### Results

The results obtained from the May 2025 cipher rounds for the question "What questions do you have about today's test or procedure"? were 11.9% (2.142) stating they had no questions (indicating they understood the procedure) out of 18 total responses for the question. That left 88.1% (15.85) of the patients interviewed responding that they had questions about the procedure. The results from July 2025 for the same questions were 13.4% (4.422) out of 33 responses indicating an increase in patient comprehension of the procedure by 1.5 percent points, or an average of 2.28 more responses indicating comprehension of the procedure. A two-proportion z-test showed no statistically significant difference between the two groups,  $z = -0.11$ ,  $p = 0.91$ . The 95% confidence interval for the difference in proportions (July - May) ranged from -19.3% to +17.3%, indicating that the true effect could plausibly be a decrease or increase in comprehension.

### Conclusions

Although the percentage of patients who responded "no questions" increased slightly from May to July, this change was not statistically significant, and the confidence interval suggests that the observed difference could easily be due to random variation. This data would not support the idea that patient comprehension was improved using a screener prior to the patient's MRI appointment during July 2025 compared to no screener implementation in May of the same year.

Student research funding was provided by  
Scholars Fellowship Award, School of Medicine Greenville

# Kelsi Marts, BS

Session 2  
Abstract 35



## Authors

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## Affiliations

Prisma Health and Siemens Healthineers

## Mentor

Patrick Springhart, MD

## Evaluating the Impact of MRI Preparation and Educational Materials on Scan Times



STUDENT RESEARCH  
SYMPOSIUM

### Background/Purpose

Background: MRI throughput significantly affects radiology efficiency and patient satisfaction. Workflow metrics like arrival-to-preparation time and exam duration shape patient perceptions, with national benchmarks at 15–20 minutes and 30–45 minutes, respectively. This study examines whether a pre-exam patient screener and educational materials improve workflow and impact satisfaction scores. Purpose: To evaluate how a patient screener and educational materials (independent variables) impacts Key Performance Indicators (KPIs) (dependent variables), and whether changes correlate with patient satisfaction related to timeliness and communication. The KPI's include MRI arrival-to-preparation time and exam duration at Patewood Outpatient Center.

### Methods

This two-phase study began with implementing a patient screener in June 2025. The screener contacted patients one week before their MRI to provide directions, set expectations, and answer questions, aiming to improve punctuality and reduce two key metrics. The first metric, arrival-to-preparation start time, measured the interval between patient arrival to the start of MRI preparation. This was calculated using Electronic Medical Record (EMR) timestamps reported manually in minutes:seconds (MM:SS). The second metric, exam duration, measured total scan time using data from ActExcell, also reported in MM:SS. ActExcell, a Siemens Healthineers program, uses data analysis and expert guidance to improve imaging operations. Averages from May and July 2025 were compared to national benchmarks. Descriptive analysis highlighted changes in performance. While not yet implemented, the second phase will focus on providing patient educational materials.

### Results

Arrival to preparation time changed from 16:00 to 24:00 This is a 50% (8-minute) increase in arrival to preparation time. Exam duration changed from 50:00 to 51:00, with a 2% increase in exam duration time.

### Conclusions

Future work will evaluate the impact of patient educational materials. Continued analysis will assess the scalability of low-cost interventions to improve MRI workflow and patient experience across imaging centers.

Student research funding was provided by  
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# Brenna Matthews, BS

Session 1  
Abstract 85



## Authors

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## Mentor

Jennifer Grier, PhD



## Scoring of Pediatric Respiratory Syncytial virus (RSV) Infection Severity: A Systematic Review

### Background/Purpose

Respiratory syncytial virus (RSV) is the leading cause of acute bronchiolitis in children worldwide and many factors contribute to infection severity. Several clinical tools have been developed to evaluate the severity of bronchiolitis infections and aid in treatment decisions; however, these tools often lack validation, exhibit parameter variations, and do not specifically address RSV infections. This study aims to systematically review RSV severity scoring systems applied to pediatric patients (<18 years old) to establish a comprehensive understanding of current classification tools.

### Methods

A systematic review was conducted using Rayyan AI. Search terms included severity, severe, severity of illness index, classification, RSV, respiratory syncytial virus, respiratory syncytial infection, and respiratory syncytial viruses. Reviews, systematic reviews, meta-analyses, commentaries, letters, and cohort studies with populations aged >18 years old were excluded. Included studies were those with a defined scoring system with at least 2 clinical variables. The screening was performed by three independent researchers. Any conflicts were decided via majority.---

### Results

From PubMed, Embase, CINHAL, and Web of Science, a total of 31,665 articles were identified and imported in Rayyan. After removal of duplicates, 19,729 articles were screened for inclusion criteria. A total of 65 are in the process of full text review. Notably, all tools incorporated clinical and physical exam findings. However, results indicated substantial variation in these parameters.---

### Conclusions

Preliminary findings demonstrate variability in classifying RSV infection severity and the need for standardized scoring. These results will guide the development of an evidence-based severity scoring tool to be applied in evaluation of pediatric patients in Upstate, South Carolina. RSV infection severity scores will be paired with analysis of patient demographics to inform the local community about risk status. Understanding RSV infection severity in South Carolina children will provide physicians with a critical tool to improve pediatric health outcomes from this ubiquitous and significant disease.

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STUDENT RESEARCH  
SYMPOSIUM

# Katherine McCann, BS

Session 2  
Abstract 92



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## Mentor

Roberto Martinez

## Staff Language Access Education at Blount Memorial Hospital



### Background/Purpose

Language barriers in healthcare pose a critical challenge to patient safety, satisfaction, and clinical outcomes. As healthcare systems expand and acquire new hospitals, broadening their scope of community care, consistent and effective language access for patients of all language backgrounds becomes even more essential. Staff education on the appropriate use of interpreter services is a cornerstone for ensuring quality care for patients with Limited English Proficiency (LEP). With PrismaHealth's acquisition of Blount Memorial Hospital in December of 2024, an assessment of staff's understanding of language access and services provided to better serve LEP patients is timely and can inform staff education as personnel transition to a new system.

### Methods

In order to assess Blount Memorial staff's current level of language access education, a comprehensive study was performed in which every office and service listed on the Blount Memorial website was called and asked a set of standard questions under the guise of patient care.

### Results

The results demonstrate a general lack of awareness of both patients' rights in terms of language access as well as language resources available.

### Conclusions

This data and related recommendations will be shared with PrismaHealth administrators in order to plan for staff education moving forward.

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STUDENT RESEARCH  
SYMPOSIUM

# Ben Meyer, BS

# Sergiy Pustogarov, BS

Session 2  
Abstract 104



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## Mentor

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## Connections to Contraception in the Emergency Department: A Scoping Review



### Background/Purpose

Unwanted pregnancies disproportionately affect underserved groups who lack primary care access. The emergency department (ED) may be a novel venue to initiate contraception, yet little is known about the availability, population, or characteristics of programs that seek to initiate contraception in the ED. This scoping review seeks to identify and describe ED-based interventions in the U.S. that prescribe or link patients to contraceptives.

### Methods

PubMed, CINAHL, Scopus, and EMBASE were queried (database-inception to 5/5/2025) to identify programs in academic literature or popular media. Sources were included if they discussed ED-based programs in the U.S. aimed at preventing unwanted pregnancy. Two investigators independently selected titles, abstracts, full text articles, and performed data extraction, percent agreement (PA) was used to identify discrepancies which were resolved by a third investigator. A standardized spreadsheet was used to extract program operational characteristics, intervention characteristics, and intervention assessment.

### Results

Investigators reviewed 1,978 titles (PA=98.6%); 64 abstracts (PA=84.4%) and 37 full text (PA=78.4), 20 were chosen for data extraction (PA=90.6%). Eighteen unique programs were designed to decrease risk of unwanted pregnancy. No programs were located in the Southern U.S. All programs targeted adolescent females, two programs included women up to 45 years, and three included males. Activities included referrals to primary care (X=6), provision of safe-sex-items (N=4), and ED initiation of long-acting reversible contraceptives (LARC) (N=4). Nearly all studies were pilot trials assessing feasibility, acceptability, and adoption metrics. Participant outcomes included LARC initiation (N=11), contraception follow-up (N=9), and post-intervention pregnancy (N=4).

### Conclusions

Few ED-based programs exist to decrease risk of unwanted pregnancy in the U.S. and many are pilot trials focused on assessing feasibility rather than patient follow-up. Existing programs vary widely in activities and lack standardized outcome measures. Continued study in different geographic regions, with standardized outcomes is necessary to understand the effectiveness of these programs on unwanted pregnancy.

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STUDENT RESEARCH  
SYMPOSIUM

# Charles Meyerson

Session 2  
Abstract 79



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## Provision of Culinary and Nutrition Education Through a Community-Based Cooking Class and Assessment of Participants' Knowledge, Needs, and Attitudes

### Background/Purpose

Literature suggests that lifestyle changes, particularly dietary modifications, can help to prevent the development of many chronic diseases. (1,2) Providing patients and clinicians with practical, evidence-based tools can help establish a continuum of care that supports long-term adherence to dietary changes (3). We aim to assess nutrition and culinary knowledge and needs of patients and community participants and evaluate the impact of cooking class participation.

### Methods

Our project involves incorporating culinary and nutrition education during a community based cooking class session. Led by internal medicine residents, the cooking class is held weekly in the life center YMCA teaching kitchen. Participants include patients from internal medicine clinic and members of the YMCA. An anonymous pre-survey is given to assess the knowledge, attitude, and needs of the participants while the post survey assesses the impact of class. Covered components during the cooking class include the relationship between food and specific disease states and cooking styles and techniques.

### Results

The top three nutrition interest from participants are weight loss (74.4%), prevent/treat diabetes (53.8%), and getting off their medications (51.3%). The top three culinary skill interests are cooking meals quickly (76.9%), cooking healthy meals for low cost (71.8%) and cooking healthy meals for one person (46.2%). A median confidence of 7 (5-9.5) in cooking skills was recorded from the pre-survey with an increase to 9 (7.5-10) in the post survey.

### Conclusions

Results indicate that the cooking class increases participants' confidence in cooking skills. Increasing the sample size and following participants' health outcomes would inform our work further.

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STUDENT RESEARCH  
SYMPOSIUM

# Dru Montgomery, BS

Session 1  
Abstract 72



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## Placental Syphilis: A Growing Concern for Neonatal Health



### Background/Purpose

Congenital syphilis is a preventable but increasingly prevalent public health concern in the United States. Rising rates are attributed to gaps in prenatal screening, inadequate treatment, and socioeconomic barriers. Placental pathology can be an essential tool for diagnosing congenital infections, especially when maternal history or treatment documentation is incomplete.

### Methods

A 27-year-old G1P0 presented at 14 weeks gestation with abdominal pain and was found to have an intra-uterine pregnancy and complex right adnexal masses. She underwent a right salpingo-oophorectomy with pathology confirming mature cystic teratoma. Her pregnancy was further complicated by essential hypertension, tobacco use, and a positive urine drug screen for methamphetamine. At 37.5 weeks, she delivered a viable infant. Late in pregnancy, RPR was reactive at 1:64, and the patient received a full course of penicillin for presumed late latent syphilis. Due to unclear treatment history and concern for fetal exposure, the placenta was sent for pathologic evaluation.

### Results

Gross examination revealed a 682 g placenta (95th–97th percentile) with subchorionic and parenchymal fibrin deposition. Microscopic examination showed chronic deciduitis, focal acute villitis without viral cytopathic changes, and villous infarction comprising up to 20% of the disc volume. A Ki-67 immunostain showed focal trophoblastic proliferation. These findings were interpreted as consistent with intrauterine infection, likely congenital syphilis.

### Conclusions

This case highlights the diagnostic utility of placental examination in high-risk pregnancies. Characteristic histologic changes can support clinical suspicion and justify neonatal evaluation even when maternal treatment is uncertain or neonatal symptoms are absent. Features such as villitis, chronic deciduitis, and infarction reflect the placenta's response to infectious insult. Placental pathology offers valuable insight in pregnancies complicated by syphilis. Its use may help guide postnatal management, ensure early treatment, and reduce missed diagnoses of congenital infections.

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# Meredith Morgan, BA

Session 1  
Abstract 116



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Jennifer Grier, PhD

## Interferon-Induced Protein 35 in *A. Baumannii*-Induced Cell Death of Respiratory Epithelial Cells



### Background/Purpose

Common viral infections, like Respiratory Syncytial Virus (RSV) and COVID-19, lead to numerous hospitalizations every year. These patients are often highly susceptible to developing secondary bacterial infections which can lead to further complications. One infectious agent of particular concern, *A. baumannii*, has a proclivity for infecting ventilator-assisted patients. Interferon-induced protein 35 (IFI35) is highly expressed in the immune response to viral infections with unknown links to bacterial infections. We sought to investigate the effect of IFI35 on the cellular response to bacterial infections to better understand patient susceptibility to secondary infections.

### Methods

To study the effects of IFI35 on cell viability, IFI35 knockout cells were generated using CRISPR-Cas9 in a human lung epithelial cell line (A549). IFI35 KO and wild-type control cells were infected with *A. baumannii* and compared to mock infected cells. Fluorescence viability assays were performed at 8- and 24-hours post infection, then analyzed using flow cytometry.

### Results

IFI35KO was confirmed at the DNA and protein level in two independent cell lines for application in infection studies. Following infection, IFI35KO A549 cells showed less cell death compared to control cell lines.

### Conclusions

These findings suggest that the expression of IFI35 contributes to cell death in the context of bacterial infection, potentially resulting from or contributing to an increased inflammatory response which is detrimental to the lung environment. Further study of IFI35 may reveal changes in the expression of key components of the host immune response as a result of the IFI35's activity in the cell. Insight into the molecular mechanisms by which IFI35 drives cell death may assist in the development of new interventions and strategies to improve patient outcomes for those with ubiquitous, sometimes fatal, respiratory infections.

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STUDENT RESEARCH  
SYMPOSIUM

# Elizabeth Moshier, MS

Session 2  
Abstract 103



## Authors

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## From Clicks to Clinics—Optimizing Onboarding Strategies to Connect Primary Care Facilities with Physical Activity Programs



### Background/Purpose

Exercise is Medicine Greenville® (EIMG®) is a physical activity referral pathway that partners the YMCA with primary healthcare providers to orchestrate a comprehensive 12-week program to inspire lifestyle changes in patients. Since its launch in 2016, EIMG® has graduated 566 patients. This program has demonstrated statistically significant improvements in body weight and blood pressure for patients with hypertension, as well as high satisfaction of patients graduating from the program. As EIMG® continues to scale, our team's goal is to evaluate the patient reach of onboarding strategies with family medicine/internal medicine clinics. The purpose of this study is to compare two different program onboarding processes (a pre-recorded video versus a comprehensive in-person/virtual onboarding experience) and their effect on EIMG® referrals.

### Methods

We employed two onboarding strategies to educate clinics on EIMG®. In Phase 1, we emailed an introductory video detailing the referral process to the clinics. After four months, clinics were invited to schedule an in-person or virtual meeting with EIMG® team members for a more comprehensive onboarding process (Phase 2). Four months after Phase 2, clinic staff were invited to participate in semi-structured interviews. The i-PARIHS framework guided code book development for coding and qualitative analysis of transcripts, which is currently ongoing using nVivo software.

### Results

Of the 20 clinics we contacted, 12 clinics chose to adopt the EIMG® program. In total, 21 clinic staff members from 10 of the adopting clinics participated in individual interviews. Coding and data analysis of the 21 transcripts is ongoing with a focus on comparing the perceived efficacy of Phase 1 and Phase 2.

### Conclusions

By evaluating different onboarding strategies, we hope to determine which approach is more effective in improving referral rates. We hope to optimize the procedures for clinic onboarding as we improve and scale the EIMG® referral pathway.

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STUDENT RESEARCH  
SYMPOSIUM

# Isabella Nashbar, MD Candidate

Session 2  
Abstract 50



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## Impact of Volunteerism on Medical Student Empathy and Burnout



STUDENT RESEARCH  
SYMPOSIUM

### Background/Purpose

Empathy is an essential trait for doctors to possess and yet, during medical school, the trials can whittle away at this quality. Simultaneously, the high stress of medical education causes burnout to continuously rise during medical studies. Volunteerism, which promotes interpersonal connection, can potentially help to relieve this decline in medical student mental health through their education. Our study explores how participation in Root Cause, a student-led monthly health fair addressing food and health disparities in Greenville, SC, influences levels of empathy and burnout among medical students at the University of South Carolina School of Medicine Greenville.

### Methods

A survey, consisting of the Toronto Empathy Questionnaire and Maslach Burnout Inventory, were given to students at their first year orientation, second year orientation, and at every Root Cause event they attended. The first year orientation data served as each individual's baseline scores for empathy and burnout. The number of surveys that each student completed at Root Cause events served as their "attendance". The data collected was analyzed two different ways. First, Root Cause attendance was plotted against each individual's empathy and burnout scores to explore the impact that Root Cause volunteering has on empathy and burnout. Second, Root Cause attendance was plotted against the first year orientation score subtracted from second year scores in order to explore the effect that Root Cause volunteering has on change in empathy and burnout during students' first year of medical school.

### Results

Preliminary findings, and data from the 2023-2024 period, show that volunteering at Root Cause is associated with relatively stable empathy and burnout scores as opposed to the decline in empathy and increase in burnout seen in typical medical students. The data has not been analyzed for statistical significance so we have not proven a correlational relationship yet. Our statistician has the data and we are awaiting the final report.

### Conclusions

Because the study has not been evaluated for significance, no conclusions can be drawn at the present time. If volunteerism proves to improve medical student mental health, it could support the incorporation of a volunteering requirement in medical school curriculums in US medical schools.

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# Thien Nguyen

Session 2  
Abstract 60



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## Is There an Appropriate Needle Gauge for Adequate Tissue Procurement in Liver Diagnostics?

### Background/Purpose

This study aimed to determine the optimal needle gauge (18G vs. 20G) for percutaneous (PUS/PCT) liver biopsies by comparing tissue adequacy and complication rates in medical liver (ML) and liver lesion (LL) cases.

### Methods

A retrospective analysis was performed on 399 randomized biopsy samples collected between 2023 and 2025 at a single institution, including 282 ML and 117 LL cases. Wedge biopsies and donor livers were excluded. Data extracted from electronic medical records included demographics, pathology features (sample size, fragmentation, adequacy, portal tracts, diagnosis, diagnostic yield), and procedural details (indication, site, needle type/gauge, number of passes, anesthesia, labs, complications, and embolization). Comparisons between 18G and 20G were stratified by ML and LL biopsies. Statistical associations were assessed using ANOVA with significance at  $p < 0.05$ .

### Results

Adequate samples were significantly more frequent with 18G needles in both ML (92% vs. 52%) and LL (98% vs. 78%) cases ( $p=0.0005$ ). Tissue fragmentation was significantly less, portal tract yield greater, and diagnostic yield higher with 18G (all  $p=0.0005$ ). Complication rates did not differ significantly between gauges, but re-biopsy rates were lower with 18G ( $p=0.0023$ ). Overall, 18G needles were strongly associated with higher adequacy for both ML ( $p=0.0001$ ) and LL ( $p=0.0009$ ) compared with 20G.

### Conclusions

AASLD guidelines currently recommend 16G needles for PUS/PCT, particularly in medical liver biopsies, and 18G for lesion biopsies. However, these findings demonstrate that 18G needles provide reliable adequacy and diagnostic yield for both ML and LL without increased complication risk. Therefore, 18G represents the smallest gauge that can consistently achieve sufficient tissue for both biopsy types. Further studies are warranted to refine approaches that reduce complication risks while maintaining diagnostic effectiveness with 18G needles.

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# Adeyemi Oduwole, MPH

Session 1  
Abstract 86



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## Mentor

Beth Motley, MD

## Sex-Specific Effects of Plant-Based Diets in Type 2 Diabetes: Systematic Review Protocol



### Background/Purpose

Type 2 diabetes mellitus is a growing global health concern. Lifestyle medicine, particularly a plant predominant eating style, has emerged as a promising approach to improve glycemic control and reduce cardiometabolic risk. While evidence supports the effectiveness of plant-based nutrition in managing type 2 diabetes, few studies have explored whether these benefits differ by sex.

### Methods

Peer-reviewed original research articles will be identified through a comprehensive literature search of electronic databases including PubMed and the Cochrane Central Register of Controlled Trials. Eligible studies will include adults diagnosed with type 2 diabetes who follow a vegan, vegetarian, or whole-food plant-predominant diet and report glycemic outcomes stratified by sex. Title and abstract screening, full-text review, and data extraction will be conducted independently by reviewers using Covidence, with discrepancies resolved through consensus or input from faculty mentors. A formal risk of bias assessment tool will be considered based on study design.

### Results

This ongoing systematic review aims to evaluate sex-specific differences in glycemic outcomes among adults with type 2 diabetes who adopt plant predominant nutrition interventions. The primary outcomes of interest include hemoglobin A1c, fasting blood glucose, and insulin sensitivity. Secondary outcomes may include changes in body weight, body mass index, and medication use when reported by sex.

### Conclusions

This review will address a critical gap in the literature by examining whether males and females experience different glycemic responses to plant-based dietary interventions. Findings will inform sex-specific dietary recommendations and support the integration of sex and gender considerations into lifestyle medicine education and practice.

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STUDENT RESEARCH  
SYMPOSIUM

# Bailee Oliver, MPH

Session 1  
Abstract 102



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## Mentor

Neha Hudepohl, MD

## Where We Live Matters: Associations Between Food Deserts, Their Residents and Obstetric Complications



### Background/Purpose

Food insecurity disproportionately increases negative outcomes and complications in pregnant patients such as depression, anxiety, gestational diabetes, and hypertension. This study aims to describe the association between food insecurity and pregnancy-related complications including maternal psychiatric conditions compared to pregnant patients living in food secure areas based on home addresses.

### Methods

Pregnant patients (N=133) were randomized to enhanced vs standard electronic psychiatric screening throughout pregnancy and the post-partum period. Data was collected on obstetric complications, medical history, psychiatric history/interventions as well as patient survey data related to social determinants of health and demographics. Data for this sub-investigation was collected via chart extraction for addresses and RedCap extraction for complication history and sociodemographics. Addresses were input into the USDA Food Access Research Atlas and low access layers were recorded. Patients were classified as residing in a food-insecure area or food-secure area based on USDA data.

### Results

The odds of being diagnosed with a pregnancy-related psychiatric condition among patients who live more than 20 miles from a grocery store in rural areas or 1 mile in urban areas are 0.91 times the odds among food secure patients (95% CI: 0.38, 2.22). The odds of being diagnosed with a pregnancy-related non-psychiatric complication among patients who live more than 20 miles from a grocery store in rural areas or 1 mile in urban areas are 1.18 times the odds among food secure patients (95% CI: 0.57, 2.43).

### Conclusions

Results from this investigation were determined to be inconclusive. This does not indicate that there is no effect from food insecurity on pregnancy outcomes but does indicate that the study displays limited statistical power. Further investigation will be conducted to analyze USDA defined food insecure areas with patient's subjective reporting of food insecurity. These results will allow for the prioritization of prevention-based interventions by providers and patients alike.

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STUDENT RESEARCH  
SYMPOSIUM

# Lauren Palmariello

Session 1  
Abstract 89



## Authors

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Arwen Declan, MD, PhD

## Social Media as Information Flow Between Emergency Departments and the General Public: A Scoping Review



### Background/Purpose

Social media platforms have emerged as an integral part of modern society. These platforms serve a variety of purposes, including to connect, entertain, and inform users. However, the use of social media in healthcare has only partially been explored, even in the technologically savvy field of emergency medicine. This scoping review explores the current bidirectional flow of information between emergency departments (EDs) and the public on various social media platforms.

### Methods

The protocol for this scoping review follows recommendations from Arksey and O'Malley and JBI. Reporting follows the PRISMA-ScR (PRISMA Scoping Review) framework. We developed an initial search strategy with the Prisma Health librarians (740 articles, 206 duplicates) and progressively completed screening (534 articles), full text review (72 articles), and data extraction (38 articles) using the Covidence systematic review tool.

### Results

Our findings from 38 articles indicate that social media does carry bidirectional information flow between the public and the ED. The predominant populations using social media for healthcare information dissemination are the general public, patients, and emergency physicians and clinicians. In this context, X/Twitter and Facebook are the platforms used most commonly. We found that ED personnel use social media to inform and educate the public, whereas the main intent of the public is to share personal opinions and information; key themes of communication included signal detection, syndromic surveillance, and health communication.

### Conclusions

Our work is the first to explore the use of social media for information flow bidirectionally between the ED and the public. Information shared by the public on social media can aid ED physicians, particularly when they must evaluate unusual presentations or recognize new trends. Similarly, information shared by ED personnel can educate and inform the public. Our results confirm and summarize current information flow on social media between emergency medicine and the public.

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# Chandini Patel, RDCS, RVT

## Session 2 Abstract 2



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## A Novel Lens on Psychological Safety: Examining Clark's Theory in Medical Academia



### Background/Purpose

Psychological safety describes environments whereby employees can freely express concerns and ideas without fear of reprisal, which is important in healthcare to promote innovation and patient safety. Edmonson and Clark published two prominent models of psychological safety. Although Edmonson's scale has been extensively studied, there is a lack of research examining Clark's model from a scholarly perspective. Clark's theory of psychological safety includes four levels that are hypothesized to emerge in the following order: inclusion, learner, contributor, and challenger safety. This current study investigates the relationship among Clark's levels of psychological safety.

### Methods

Employees at a medical school voluntarily completed a survey that included two psychological safety scales. Deidentified data were analyzed. To evaluate the reliability and validity of Clark's scale, a Cronbach's alpha was calculated and a Pearson's correlation was run between psychological safety measured by a new Clark's scale and the well-validated Edmonson's scale. We then examined the relationship among Clark's levels of psychological safety by investigating the proportion of participants whose responses aligned with a hierarchical interpretation of Clark's levels. We further investigated this relationship by demographic characteristics including gender, clinical staff/faculty, non-clinical staff/faculty, and those who identified as a minority group.

### Results

A total of 462 participants completed the survey. Clark's scale had high internal consistency (Cronbach's alpha = 0.92) and significantly correlated with Edmonson's scale ( $p < 0.0001$ ). The four stages of psychological safety were examined for every participant, and 92.9% of participants' self-reports followed a stepwise order across the four levels, indicating an ordinal relationship among Clark's levels of psychological safety. This effect was observed in each demographic group analyzed.

### Conclusions

This study supports a progressive sequence from inclusion to challenger safety. Understanding the nature of Clark's levels will inform the development of future training initiatives for academic medicine to cultivate a culture of psychological safety.

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# Mason Pearce

Session 2  
Abstract 24



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## Comparison of Proximal Junctional Kyphosis Rates in Lenke 1 Adolescent Idiopathic Scoliosis Patients Undergoing Posterior Spinal Fusion with Upper Instrumented Vertebrae at T3, T4, or T5

### Background/Purpose

Proximal junctional kyphosis (PJK) is a known complication following posterior spinal fusion (PSF) for adolescent idiopathic scoliosis (AIS), often developing within 1–2 years postoperatively. Incident is from 7–27% and of those 10% may undergo surgical revision due to pain or neurologic deficit making this finding important to recognize. Limited data exist regarding whether the level of the upper instrumented vertebra (UIV) influences PJK risk in Lenke type 1 AIS patients.

### Methods

A retrospective review of 75 Lenke type 1 AIS patients (ages 11–18) undergoing index PSF with UIV at T3, T4, or T5 was performed. Exclusions included revision surgeries and vertebral body tethering. Coronal and sagittal radiographic parameters were assessed preoperatively, immediate post-op, and at 3M, 6M, 1Y, and 2Y. PJK was defined as  $>10^\circ$  increase in angle between UIV and UIV+2. Patients were stratified by thoracic kyphosis and PJK development.  $\chi^2$  and ANOVA with post-hoc Tukey were used for analysis ( $p < 0.05$ ).

### Results

T3 patients had more fused levels (10.5 vs. 9.3 vs. 8.6,  $p < 0.001$ ), longer operative times (424 vs. 357 vs. 328 min,  $p = 0.008$ ), and higher blood loss ( $p = 0.037$ ). PJK incidence was 13% (T3), 17.2% (T4), and 30.4% (T5), not statistically significant ( $p = 0.3$ ). The  $\Delta$ PJK angle at 6M post-op was significantly higher in T4 & T5 groups (T4: 1.7, T5: 6,  $p < 0.028$ ). Overall, 20% developed PJK, with significantly larger preoperative cSVA (23.4 mm vs. 8 mm,  $p < 0.001$ ).

### Conclusions

T3 UIV was associated with greater surgical burden but similar complication rates. T5 UIV trended toward higher PJK incidence but was statistically insignificant. Higher preoperative cSVA strongly predicted PJK development. Larger studies are needed to validate these findings.

# Danny Pham

## Oral Presentation Abstract 70



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### Mentor

Stephan Pill MD MSPT

## Patients with Higher Preoperative ASES Scores have a Lower Chance of Achieving Successful Outcomes After Arthroscopic Rotator Cuff Repair



STUDENT RESEARCH  
SYMPOSIUM

### Background/Purpose

Rotator cuff repair is a common surgery, and the American Shoulder and Elbow Surgeon (ASES) score is frequently used to evaluate outcomes. Patients with rotator cuff tears present with a wide range of disability, but the influence of preoperative ASES scores on long term outcomes results remain unclear. A better understanding of this relationship could help counsel surgical decision-making and manage patient expectations. The primary objective of this study is to determine if preoperative ASES score is predictive of postoperative ASES score at two years, including the likelihood of achieving minimal clinically important difference (MCID) and substantial clinical benefit (SCB). Secondary aims included evaluating tear size, age, and/or sex effects on outcomes.

### Methods

The study is a retrospective analysis of consecutive patients who underwent arthroscopic rotator cuff repair between 2015 and 2024 by fellowship-trained surgeons at a single academic center. Open procedures and patients with insufficient follow-up were excluded. Statistical analyses included a paired sample t-test, Pearson's correlation, binary logistic regression and a multivariate linear regression using SPSS.

### Results

A total of 502 patients were analyzed. Mean ASES scores significantly improved from baseline to two-year follow-up ( $p < 0.001$ ). Preoperative ASES was a significant predictor of improvement ( $\beta = -0.682$ ,  $p < 0.001$ ). Pearson's correlation showed a strong negative relationship between baseline ASES and improvement ( $r = -0.675$ ,  $p < 0.001$ ) and a moderate positive correlation with final two-year ASES ( $r = 0.571$ ,  $p < 0.001$ ). Logistic regression demonstrated that lower preoperative ASES scores were strongly associated with achieving both MCID (OR=0.957, 95% CI=0.940-0.972,  $p < 0.001$ ) and SCB (OR=0.945, 95% CI=0.929-0.960,  $p < 0.001$ ). Larger tear size predicted lower likelihood of achieving MCID, while age and sex were not significant predictors.

### Conclusions

At two years, patients with lower preoperative ASES scores experienced greater improvement and were more likely to achieve clinically meaningful thresholds. Incorporating baseline ASES into preoperative evaluation may enhance prognostication and improve shared decision-making in rotator cuff repair.

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# Colleen Phan, BS

Session 2  
Abstract 33



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## Mentor

Jennifer Grier, PhD

## Environmental Influences of Pediatric RSV: A Geospatial Approach



### Background/Purpose

The pediatric population is particularly susceptible to disease caused by the respiratory syncytial virus (RSV). A multitude of environmental factors, including water quality (Thomas et al.) and air quality (Girguis et al.), as well as the abundance of green spaces (Tischer et al.), impact the spread of RSV. Infrastructure qualities, such as housing age and crowding, have also been shown to promote the spread of respiratory disease (Holmen et al.). This mapping project aims to create a comprehensive geospatial map to locate high-risk areas in South Carolina that contribute to increased incidences of pediatric RSV cases. Presently, the map identifies sludge dump sites as reported by the South Carolina Department of Public Health, healthcare facility proximity, and green spaces via NDVI (Normalized Difference Vegetation Index) mapping using LandsAT data and Google Earth. Air quality data using InMap modeling software has been mapped along with housing age and household crowding data from the US Census. Pediatric RSV case data, once released by Prisma Health, will complete the project. The researchers anticipate analyzing the finalized map and identifying environmental factors that appear to correlate with pediatric RSV cases.

### Methods

Pediatric RSV case data (ages 0-5) were obtained from local hospitals (Prisma Health), public health departments (South Carolina Department of Public Health), and national surveillance systems (CDC RSV-NET). This project uses census data to gather information on income, race/ethnicity, education level, household size, and insurance status. Climatology data was collected from the National Center of Environmental Information. Environmental data, such as air quality indices, sludge dumping sites, and proximity to healthcare facilities, were reported by the South Carolina Department of Public Health. PFA contamination data was collected by the non-profit organization, Environmental Working Group. While housing infrastructure age data was collected from the US Census. Additionally, air pollution emission data were collected using InMap modeling software and data from the National Emissions Inventory. Initial Mapping was performed using ArcGIS mapping software and InMap. NDVI mapping was accomplished via LandsAT data and Google Earth Engine.

### Results

To be determined.

### Conclusions

To be determined.

Student research funding was provided by  
Scholars Fellowship Award, School of Medicine Greenville

STUDENT RESEARCH  
SYMPOSIUM

# Maria Pita

# Luis Rivero

Session 2  
Abstract 28



### Authors

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### Mentor

Blakely Amati

## Culturally Tailored Grocery Store Tours to Promote a Whole-Food, Plant-Based Diet for Hispanic Families: A Community-Based Approach to Combat Pediatric Obesity and MAFLD

### Background/Purpose

Pediatric obesity and metabolic dysfunction-associated fatty liver disease (MASLD/MAFLD) disproportionately impact Hispanic/Latino children in the United States, largely due to intersecting cultural, social, and economic barriers. Plant-based dietary patterns are associated with improved metabolic outcomes, yet adoption is limited by cost, accessibility, and a lack of culturally relevant guidance. This project aims to address these disparities by developing and implementing culturally tailored grocery store tours that promote affordable, whole-food, plant-based eating within Hispanic/Latino communities.

### Methods

This community-engaged project was co-developed with pediatric faculty, medical students, dietitians, and the Hispanic Alliance. A culturally tailored grocery store tour was designed to promote whole-food, plant-based eating. Bilingual scripts were created and reviewed by community partners for cultural fidelity, then filmed in Hispanic grocery stores and edited with Spanish/English subtitles. Families will participate in a kickoff event, view the video, and complete pre- and post-surveys assessing nutrition knowledge, attitudes, and readiness to change. Survey data will be analyzed using paired t-tests for continuous variables and chi-square tests for categorical responses. Video reach will be evaluated through online analytics.

### Results

We anticipate that families participating in the grocery store tour and video intervention will demonstrate improved nutrition knowledge, greater confidence in reading food labels, and increased readiness to adopt whole-food, plant-based meals. Pre- and post-survey comparisons are expected to show significant gains in awareness of healthy, affordable food options, particularly legumes, whole grains, and frozen produce. We also expect strong community engagement, with at least 75 families attending the kickoff event and online dissemination expanding the reach of the intervention across Hispanic/Latino households in Greenville, SC.

### Conclusions

This project demonstrates how culturally tailored, community-based nutrition education can empower Hispanic/Latino families to adopt healthier eating patterns and reduce the risk of pediatric obesity and MASLD. By integrating plant-based principles with culturally relevant grocery store tours, the intervention addresses barriers of cost, accessibility, and cultural alignment. If effective, this model can be scaled through clinics, WIC programs, and community organizations to reduce nutrition-related health disparities and improve long-term outcomes in Hispanic/Latino children.

STUDENT RESEARCH  
SYMPOSIUM

# Shrika Ravichandran, BS

## Oral Presentation Abstract 78



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### Mentor

Christine Schammel, PhD

## Promoting Growth While Avoiding Hyperglycemia in Neonates: an algorithm approach



### Background/Purpose

Neonatal hyperglycemia is a prevalent metabolic disturbance, especially in very low birthweight (VLBW) infants, and can be defined as tolerant, which is self-regulated, or intolerant, that fails to be effectively controlled, increasing risk for adverse outcomes. While preventing future complications is critical, there is also a need to promote neonatal growth, which can be complex in an underweight infant with limited metabolic capacity. This study aims to prospectively evaluate an algorithm that recommends daily dextrose percentages for NICU neonates based on daily blood glucose levels and birthweight to improve both metabolic control and growth outcomes.

### Methods

This prospective study included 45 NICU neonates on total parenteral nutrition (TPN) from June 1 to August 1, 2025. Data collected for each infant comprised of estimated gestational age (EGA), birthweight (BW), maternal health and morning blood glucose (BG) levels for the first week of life. An algorithm, derived from historical data, utilized BW, BG, and day of life to generate a suggested dextrose percentage daily, which was provided to the respective physician.

### Results

The algorithm most frequently suggested values that were 2.5-5 percentages higher than what physicians ordered for patients, meaning they thought that suggestions were too aggressive. Infants that were tolerant to their dextrose administration showed greater changes in weight compared to those that were intolerant. Tolerant infants generally had higher birthweights, but in contrast had lower growth percentages.

### Conclusions

Differences in suggested dextrose values and physician orders highlights a possible gap in algorithm based recommendations and current clinical practice. The relationship between growth optimization and glucose regulation has yet to be clearly defined. Future goals of this study include improving the algorithm by re-evaluating included variables based on physician input, and developing more specific dextrose protocols for neonates on TPN by birthweight to promote favorable health outcomes.

Student research funding was provided by  
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# Ruthie Richardson, BS

Session 2  
Abstract 37



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## Mentor

Kerry Sease, MD



## Evaluating the Medical Legal Partnerships Impact on Health-Harming Legal Needs of Pediatric Patients

### Background/Purpose

The Upstate Medical-Legal Partnership (UMLP) is a collaboration between Prisma Health, South Carolina Legal Services, and Furman's Institute for the Advancement of Community Health. The MLP works to address health-harming legal needs (HHLNs) and improve health outcomes for low-income pediatric and geriatric patients in the Upstate by integrating medical and legal services. HHLNs are civil legal matters that negatively affect a patient's health and wellbeing, such as lacking a health power of attorney, Medicaid denials, or housing issues. The purpose of this study was to examine case closure reason by referring HHLN among pediatric MLP patients, further filtered by referring practice.

### Methods

For the current analyses, the required variables were obtained from the UMLP REDCap database. Descriptive statistics (i.e., percentages and frequencies) for study variables were obtained using SPSS.

### Results

The final sample included 1735 pediatric referrals, including 328 primary care and 566 speciality care referrals. Guardianship (N=174) and powers of attorney (N=109) cases were the most common specialty care referrals, with counsel and advice as the most common case closure reason (N= 237). Among primary care settings, custody and adoption (N=84) was the most common referral reason, with counsel and advice (N=194) as the most common case closure reason.

### Conclusions

While the most common case closure reason was counsel and advice among both referring practices, overall specialty care referrals were more likely to result in a higher level of case representation. These differences are likely because pediatric patients referred from speciality care settings may have more complex medical needs and therefore may result in more actionable cases. Results from this study will allow the UMLP to better understand civil legal needs of UMLP patients and could be used to provide targeted provider education by care setting and identify gaps in services.

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STUDENT RESEARCH  
SYMPOSIUM

# William Robinson, BS

Session 2  
Abstract 88



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## Mentor

Peter Gyarmati, Ph.D.



## Short Chain Fatty Acids Enhance Daunorubicin Cytotoxicity in vitro in Acute Lymphoblastic Leukemia Cells

### Background/Purpose

Acute lymphoblastic leukemia (ALL), a malignancy of immature B- or T-cells, is the most common pediatric cancer and the leading cause of cancer-related death in individuals under 20 years old. Although advances in chemotherapeutic regimens have increased the 5-year survival rate of ALL to approximately 70%, severe treatment-related side effects pose numerous risks to a developing child. Novel therapeutic options with a lower toxicity are needed to improve morbidity and long-term outcomes in these patients. Short chain fatty acids (SCFAs), naturally occurring products of gut microbiome metabolism, have been shown to be dramatically decreased in ALL and are known to play a role epigenetically as histone deacetylase inhibitors (HDACis). Previous research found that certain histone deacetylases are overexpressed in ALL, providing an ample target for SCFAs as a potential treatment option.

### Methods

Viability of CCL-119 T-lymphoblasts was assessed after 24 hours in varying concentrations of butyrate, propionate, and acetate-SCFAs known to be diminished in ALL. To evaluate potential combinatory effects with current chemotherapy drugs, cell viability was calculated in the presence and absence of SCFAs alongside daunorubicin, a chemotherapeutic drug commonly used in the treatment of ALL.

### Results

This study found that propionate significantly decreased CCL-119 cell viability in comparison to the other SCFAs. Butyrate showed enhanced cytotoxicity with a concentration of 0.1  $\mu\text{M}$  daunorubicin, while propionate and acetate were significantly more toxic at 10  $\mu\text{M}$  daunorubicin. This study is ongoing, however, the cytotoxic effect of butyrate is likely mediated through HDAC inhibition, whereas the effect of propionate and acetate seem to involve increased production of reactive oxygen species (ROS).

### Conclusions

These findings support further investigation of SCFAs as adjunctive agents in the treatment of ALL. Their ability to enhance chemotherapeutic drug efficacy while potentially decreasing the systemic toxicity could offer a novel strategy for pediatric patients.

Student research funding was provided by  
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STUDENT RESEARCH  
SYMPOSIUM

# Abigail Rohr

## Oral Presentation Abstract 52



### Authors

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### Mentor

Jennifer Grier, PhD

## In Vitro Characterization of Glioblastoma Inflammatory Signatures: Insights into Resistance and Model Selection



### Background/Purpose

Glioblastoma multiforme (GBM) poses a major challenge for patients and clinicians due to treatment resistance and recurrence. Inflammatory profiling is essential for revealing immune evasion and molecular remodeling strategies of GBM, and these pathogenic mechanisms drive the need for subtype-specific treatments and immunotherapies. This study aimed to characterize inflammatory gene expression and stress responses in two immortalized GBM cell lines, correlate these with glioblastoma subtypes, and advance treatment strategies for patients with this aggressive cancer.

### Methods

To model treatment-induced inflammation, LN-18 and LN-229 human GBM cells were cultured and stimulated with lipopolysaccharide (LPS). Total RNA was extracted and expression of inflammatory genes (CCL2, STAT3, IL-33, CD274, TGF- $\beta$ , IL-10) and angiogenic neuropilin-1 (NRP1) was assessed by RT-qPCR in control and LPS-treated groups.

### Results

Before treatment, LN-18 cells expressed 40% more CD274 than LN-229 cells, while NRP1 was nearly five times greater in LN-229. LPS exposure reduced NRP1 in LN-229 by 71.1%, eliminating previous differences with LN-18. The same treatment increased CCL2 sevenfold in LN-229 versus an untreated control and about elevenfold compared to treated LN-18 cells, indicating a strong immune response by LN-229 cells in response to LPS. STAT3 was significantly upregulated in LN-18 cells after LPS exposure compared to LN-229, suggesting differential inflammatory signaling between GBM subtypes. TGF- $\beta$ , IL-10, and IL-33 expression remained low across all cell lines and conditions, with no significant differences.

### Conclusions

LN-229 cells present a distinct inflammatory and mesenchymal-like gene signature relative to LN-18. These unique profiles emphasize the importance of model selection in advancing our understanding of GBM. Our findings support LN-229 as a valuable model of aggressive glioblastoma and implicate NRP1 as a critical target for understanding mechanisms of resistance. Expanding inflammatory profiling across additional cell lines can advance clinical translation and guide targeted immunotherapies, ultimately improving outcomes for patients living with glioblastoma.

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# Georgia Roper, BS

Session 2  
Abstract 80



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## Mentor

Christine Schammel, PhD

## Recurrence at the Reconnection: A Retrospective Study of Anastomotic Recurrence in Colorectal Cancer



### Background/Purpose

Colorectal cancer is the third most common cancer worldwide and contributes to 8% of all cancer-related deaths. While surgical resection is the mainstay of treatment, recurrence occurs in approximately 15% of cases, presenting a unique treatment challenge. The most common location for recurrence is the anastomosis site and can occur even with R0 margins. The mechanisms behind these recurrences remain unclear, but theories include seeding of the cavity, incomplete margins, or anastomotic leakage creating a favorable environment for cancer cells.

### Methods

The retrospective study included analysis of 27 patients identified through a pathology report database search with inclusion criteria of recurrent colorectal carcinoma at the site of prior anastomoses from 2015-present. Data including demographics, tumor pathology and treatment information, and patient outcome was extracted from EMR records. Univariate analyses between tumor or demographic variables using Kaplan Meyer curves and hazard ratios were performed.

### Results

27 patients were identified with 74% of original carcinomas located in the colon and 26% located in the rectum. 36% and 32% demonstrated lymph-vascular invasion (LVI) and perineural invasion, respectively. Findings were consistent with published reports, including a decreased disease-free survival with LVI present ( $p=0.0004$ ), increasing tumor size ( $p=0.0466$ ), and increasing number of positive lymph nodes ( $p=0.0027$ ).

### Conclusions

Colorectal cancer recurrence presents a persistent clinical challenge with unclear causes. This study sought to find answers regarding recurrence patterns and possible predictors of high risk of recurrence to prolong quality of life, inform treatment and surveillance, and minimize uncertainty. Genetic data from these 27 patients are currently being analyzed to identify associations between mutations and risk of recurrence. Due to limited sample size, recommendations are to repeat this study with a larger sample across multiple institutions.

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Scholars Fellowship Award, School of Medicine Greenville, Prisma Health Department of Surgery

STUDENT RESEARCH  
SYMPOSIUM

# Jennifer Rumsey, M3

Session 2  
Abstract 32



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## Mentor

Arwen Declan

## Emergency Clinician Workflow Across Legacy and Upgraded Workstation in the Midst of Technological Change



### Background/Purpose

Technological transitions cause workflow adjustments that can affect clinician efficiency and patient safety. However, Emergency Clinicians' (ECs') workflow adjustments after computer workstation transitions are not well defined. To define EC workflow adjustments to technological change, we measured EC workflow and evaluated EC reactions after concurrent computer hardware, software, and configuration transitions. Our mixed methods approach combines temporal observations with survey responses to reveal hidden responses to changes and develop insights into opportunities for workstation optimization.

### Methods

We evaluated EC workflow adjustments across workstation changes from legacy Manual Login (ML; Type 0 hypervisor) computers to newer Proximity Card Login (PCL; Type 2 hypervisor) workstations that were programmed with more frequent auto-logouts relative to prior ML computers for increased security. EC:workstation interactions were measured via a time study during 2 hours of an urban trauma center clinical shift (IRB: QI/NHSR, Pro21949815), with a random convenience sample of adult and pediatric ECs (n = 20) selected during extended daytime hours (7a-9p); interactions were measured at centralized EC workstations. EC:workstation interaction events (login, software opening, logout, etc) were tracked with the ATracker Pro mobile app. Measurements were obtained before and after the workstation transition. Data were compared with t-tests. Perspectives and responses to change were collected via a custom REDCap<sup>1,2</sup> survey (36 respondents, 31 complete surveys) based on Technology Acceptance Model (TAM)<sup>3</sup> constructs with multimodal responses (free response, sliding scale).

### Results

Most workflow events did not vary between workstation types. Login events were more frequent with PCL workstations; PCL logins (7.2 seconds) and Electronic Health Record (Epic) loading (13.3s) were faster than on ML workstations (login 28.8s; EHR loading 42.2 s). Survey respondents described PCL workstations as more useful, easier to use, better quality, and better supported than legacy ML workstations. Fewer respondents reported avoiding PCL workstations than MLs. On sliding scale questions, respondents report the more frequent PCL login events did slow workflow; a similar sliding scale average reported that this hindrance is a worthwhile tradeoff to protect security.

### Conclusions

Faster PCL workstations may improve efficiency, though their frequent auto-logouts interrupt workflow while potentially improving security. Survey responses reveal ECs perceive multiple improvements in the transition from ML to PCL computers, including usefulness, system quality, and tech support. ECs appeared to prefer PCL to ML computers even though they felt the more frequent logins slowed their workflow. ECs must manage tradeoffs between competing priorities while optimizing workflows for efficiency and safety. Clinical informatics leaders must also balance efficiency, safety, and workflow impact amidst technological changes. These tradeoffs represent opportunities to optimize and support future technological transitions.

Student research funding was provided by

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STUDENT RESEARCH  
SYMPOSIUM

# Logan Russell

## Session 2 Abstract 7



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### Mentor

Erin R. Weeda, PharmD

## Association between a shortage of normal saline and in-hospital outcomes among individuals with febrile neutropenia



### Background/Purpose

Normal saline (NS) is a vital resource used to care for patients with febrile neutropenia (FN). A 2017 shortage in NS driven by Hurricane Maria raised concerns about patient outcomes. This study aimed to evaluate the impact of this shortage on in-hospital mortality and the length-of-stay (LOS) among adults with FN.

### Methods

The National Inpatient Sample database was used to identify adult FN encounters. Two cohorts were defined: a pre-shortage group (November 2016–March 2017) and a shortage group (November 2017–March 2018). The primary outcome was in-hospital mortality; LOS was secondary.

### Results

We identified 19,425 encounters with FN in the dataset, with 9,584 occurring pre-shortage and 9,841 occurring during the shortage. Cohorts were similar in age, sex, and race. Small but statistically significant differences were observed in primary payer distribution ( $P = 0.022$ ) and hospital size ( $P = 0.037$ ). In-hospital mortality was similar between cohorts (7.1% vs 6.9). Mean LOS was also similar during the pre-shortage vs shortage periods ( $10.1 \pm 12.7$  vs  $10.2 \pm 13.0$  days). Adjusted analyses demonstrated no differences in mortality (aOR = 1.02; 95% CI = 0.91–1.14) or LOS (mean difference = 0.001 days; 95% CI = -0.240 to 0.242).

### Conclusions

Mortality and LOS were stable across pre-shortage and shortage periods in patients with FN despite the national NS shortage. While such shortages may disproportionately impact patients with conditions that rely heavily on supportive fluids and rapid intravenous medication administration, this study did not observe statistically significant negative impacts on patient outcomes.

Student research funding was provided by  
Scholars Fellowship Award, School of Medicine Greenville

# Luis J Sanchez Ferrer, BS

Session 1  
Abstract 64



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## Mentor

Erin R. Weeda, PharmD



## Non-persistence with Denosumab vs. Bisphosphonates: A Meta-analysis of U.S. Cohort Studies

### Background/Purpose

Osteoporosis, characterized by low bone mineral density and structural deterioration, predisposes patients to fragility fractures associated with significant morbidity and mortality. Pharmacologic therapy is critical for fracture prevention, with bisphosphonates and denosumab representing the most widely used antiresorptive agents. However, treatment effectiveness may depend on long-term persistence. Prior studies suggest that less frequent dosing schedules, such as denosumab's biannual injection, may improve persistence compared to more frequent dosing intervals, which can be used with some bisphosphonates. This meta-analysis aimed to summarize the comparative risk of non-persistence with denosumab versus bisphosphonates in a U.S. population.

### Methods

A systematic review and meta-analysis was conducted by searching OVID Medline and EMBASE. Eligible studies were cohort designs analyzing dichotomous non-persistence with denosumab and bisphosphonates. Only studies conducted in the U.S. were included. The primary outcome was non-persistence, defined as discontinuation or significant gaps in therapy. A random-effects model was applied to calculate pooled risk ratios (RR) with 95% confidence intervals (CI).

### Results

Five studies met criteria for inclusion. Across included studies, persistence with denosumab was consistently higher. The pooled analysis demonstrated a significantly lower risk of non-persistence with denosumab compared to any bisphosphonates (RR 0.66, 95% CI 0.51–0.86), indicating a 34% relative reduction.

### Conclusions

In this meta-analysis of U.S. studies, denosumab was associated with a substantially lower risk of non-persistence compared to bisphosphonates. Improved persistence may be attributable to denosumab's convenient dosing schedule, tolerability, or administration under healthcare supervision. These findings support denosumab as a favorable therapeutic option for patients at high risk of discontinuation with bisphosphonates.

STUDENT RESEARCH  
SYMPOSIUM

# Rae Schiess, BS

Session 1  
Abstract 77



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## Preoperative Block May Lead to Lower Prolonged Opioid Use and Greater Quality of Life in Lower Extremity Amputation Patients



STUDENT RESEARCH  
SYMPOSIUM

### Background/Purpose

Prolonged postoperative opioid use is commonly defined as an opioid prescription filled between 90 and 180 days after surgery. Nearly half of patients undergoing amputation are affected, highlighting a significant concern for long-term dependence. High-risk prescribing patterns—such as overlapping opioid prescriptions, concurrent benzodiazepine-opioid prescriptions, daily doses exceeding 100 oral morphine milligram equivalents, multiple prescribers, or initiation of long-acting opioids within 90 days postoperatively—may contribute to this problem. Current anesthetic practice for amputations often involves sedation or monitored anesthesia care (MAC) in combination with regional nerve blocks. This study seeks to evaluate whether the use of a preoperative block influences the incidence of prolonged opioid use following amputation.

### Methods

We are performing a retrospective cohort study of patients with vascular disease who underwent lower extremity amputation at Prisma Health between March 2023 and March 2024. Eligible patients were identified through the institutional electronic medical record system. Inclusion criteria consists of adult patients ( $\geq 18$  years) with documented peripheral vascular disease who underwent either below-knee or above-knee amputation during the study period. Patients are excluded if they were under 18 years old. For each patient, data is extracted regarding demographic characteristics, comorbidities, type of anesthetic technique (general anesthesia, monitored anesthesia care, or combined approaches), and the use of regional anesthesia or peripheral nerve blocks. Postoperative opioid utilization is assessed during the index hospitalization, including total opioid consumption converted to oral morphine milligram equivalents (MME).

### Results

We hope that the use of preoperative nerve blocks will lead to a decline in prolonged postoperative opioid use for vascular patients who undergo lower extremity amputations.

### Conclusions

If preoperative nerve blocks are shown to reduce postoperative opioid dependence, patients undergoing lower extremity amputation may experience improved survival and enhanced quality of life. The findings of this study have the potential to inform future protocols for amputation procedures.

Student research funding was provided by  
Scholars Fellowship Award, School of Medicine Greenville

# Emma Sherman, BS

Session 2  
Abstract 27



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## Mentor

Ann Blair Kennedy, LMT, BCTMB, DrPH

## Creating Cost-Conscious Clinicians: Enhancing Cost-Awareness in Pre-Clerkship Medical Students Through A Combination of Case-Based Games and Lecture-Based Curriculum



### Background/Purpose

The U.S. healthcare system leads developed nations in spending, yet much of this expenditure is considered wasteful. Teaching health care professionals to implement high-value care (HVC) is increasingly important to address this inefficiency. HVC refers to high-quality, cost-effective care that reduces medical waste and spending. However, no widely adopted approach to teaching HVC exists in undergraduate medical education. This study evaluated the effectiveness of a game-based versus lecture intervention in improving first-year medical students' engagement and attitudes toward HVC.

### Methods

We conducted a pre-post quasi-experimental study with 107 first-year medical students. Surveys were administered at three time points: before the game-based intervention, immediately following the game-based intervention and after a subsequent lecture-based intervention. The Maastricht High Value, Cost-Conscious Care Attitude Questionnaire (MHAQ) was used to create subscales for high-value care, cost incorporation, and perceived drawbacks. Quantitative data were analyzed using paired t-tests or Wilcoxon signed-rank tests. Engagement was measured using a MERIT score and categorical classification.

### Results

Of 107 eligible students, 83 completed surveys at baseline and immediately post-game, and 55 completed all three surveys. Knowledge of test costs and cost incorporation attitudes improved following the game-based session, but gains were not sustained following the lecture. No significant changes were observed in high-value care principles or perceived drawbacks. Engagement was higher in the game-based session. Qualitative feedback emphasized the need for more content on price transparency and real-world applications. Students valued exposure to ICD-10 coding and strategies for discussing healthcare costs with patients.

### Conclusions

A game-based approach to teaching HVC was associated with higher student engagement and short-term improvements in attitudes toward cost incorporation. While the subsequent lecture-based sessions covered additional content, it was less engaging and did not significantly affect HVC-attitudes. These findings suggest interactive formats may better engage students, but reinforcement across sessions may be needed to sustain gains.

# Benjamin Sievert, MD Candidate

Session 2  
Abstract 9



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## Mentor

Erin Weeda

## Association between Polypharmacy and Medication Adherence: A Meta Analysis



STUDENT RESEARCH  
SYMPOSIUM

### Background/Purpose

Medication nonadherence is a growing concern for both the patient and healthcare system. Non-adherence to medications is associated with poor disease control, increased healthcare costs, frequent hospital admissions, and higher mortality rates. Many factors, including age, socioeconomic status, and diagnosis, could play a key role in the patient's ability to adhere to their treatment plans. One factor that has been proposed to impact medication adherence is polypharmacy; however, the relationship between polypharmacy and medication adherence has not been systematically summarized. We aimed to perform a meta-analysis to summarize real-world medication adherence in polypharmacy versus non-polypharmacy groups.

### Methods

A systematic search of Ovid Medline, Scopus, and Embase was conducted and imported into Covidence. To meet the inclusion criteria, real-world articles had to be published in the full-text form and directly compare medication adherence in polypharmacy to a reference non-polypharmacy cohort. Only studies using adherence via proportion of days covered (PDC), with a PDC cutoff of 80% for dichotomous adherence, were included. Non-adherence, defined as the proportion of patients with a PDC<80%, was the primary outcome.

### Results

A total of 8 studies evaluating 30,834 polypharmacy and 81,423 non-polypharmacy patients were included in the meta-analysis. The studies captured data spanning from 2014 to 2023. Of the polypharmacy patients, 17,727 showed nonadherence (57.7%) versus the 43,155 non-polypharmacy patients showing nonadherence (53.0%). Upon meta-analysis, there was no significant difference in medication adherence among patients experiencing polypharmacy and non-polypharmacy across included studies (Risk Ratio = 1.03 (95%Confidence Interval=0.74-1.43; I<sup>2</sup> = 98.8%).

### Conclusions

There was no difference in medication adherence in polypharmacy versus non-polypharmacy treatment regimens. These findings suggest that other factors may play a more important role in medication adherence among patients. Further studies are needed to investigate such factors.

Student research funding was provided by  
Scholars Fellowship Award, School of Medicine Greenville

# Morgan Snyder

Session 1  
Abstract 18



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## Mentor

Lindsey Bentley



## Characterizing Cardiac Amyloidosis in a Regional South Carolina Population: A Retrospective Analysis

### Background/Purpose

Transthyretin Amyloid Cardiomyopathy (ATTR-CM) is a progressive and often underdiagnosed heart condition caused by the buildup of misfolded transthyretin (TTR) protein in the heart muscle. It exists in two forms: hereditary (ATTRv), caused by TTR gene mutations, and wild-type (ATTRwt), which is linked to aging. ATTR-CM is increasingly recognized as a contributor to heart failure with preserved ejection fraction (HFpEF), especially in older adults. While non-invasive diagnostic tools and new therapies are available, there is limited real-world data on how patients are diagnosed and treated.

### Methods

Patients with confirmed ATTR-CM were identified across eight Upstate South Carolina counties using criteria including positive PYP scans, cardiac biopsy, or prescriptions for TTR-targeted therapies. Clinical and demographic data (ZIP code, diagnostic details, treatment timelines, and amyloidosis subtype) were extracted from the electronic medical record. Descriptive statistics were used to summarize the cohort characteristics.

### Results

A total of 150 patients with ATTR-CM were identified. The median age at diagnosis was 77 years, and nearly 79% were male. Most patients were White (62.7%) and lived in Greenville County (57.3%). The wild-type (age-related) form was most common, making up 74% of cases. Tafamidis was the most prescribed therapy (84%). However, only 25.3% of patients received a follow-up PYP scan, and the median time from diagnosis to treatment start was nearly two months. The median household income among patients was \$62,249.

### Conclusions

These findings highlight that most patients were older, male, and lived in urban areas. Despite treatment options, delays in care and limited follow-up imaging were common. This suggests possible disparities in access to timely diagnosis and treatment, especially for those in rural or lower-income areas. Addressing these gaps will require better referral systems, increased provider awareness, and expanded access to diagnostic and treatment services.

Student research funding was provided by  
Scholars Fellowship Award, School of Medicine Greenville

STUDENT RESEARCH  
SYMPOSIUM

# Allie Stacks

## Session 1 Abstract 8



### Authors

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### Mentor

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## Association between a shortage of normal saline and in-hospital outcomes among individuals with febrile neutropenia



### Background/Purpose

Normal saline (NS) is a vital resource used to care for patients with febrile neutropenia (FN). A 2017 shortage in NS driven by Hurricane Maria raised concerns about patient outcomes. This study aimed to evaluate the impact of this shortage on in-hospital mortality and the length-of-stay (LOS) among adults with FN.

### Methods

The National Inpatient Sample database was used to identify adult FN encounters. Two cohorts were defined: a pre-shortage group (November 2016–March 2017) and a shortage group (November 2017–March 2018). The primary outcome was in-hospital mortality; LOS was secondary.

### Results

We identified 19,425 encounters with FN in the dataset, with 9,584 occurring pre-shortage and 9,841 occurring during the shortage. Cohorts were similar in age, sex, and race. Small but statistically significant differences were observed in primary payer distribution ( $P = 0.022$ ) and hospital size ( $P = 0.037$ ). In-hospital mortality was similar between cohorts (7.1% vs 6.9). Mean LOS was also similar during the pre-shortage vs shortage periods ( $10.1 \pm 12.7$  vs  $10.2 \pm 13.0$  days). Adjusted analyses demonstrated no differences in mortality (aOR = 1.02; 95% CI = 0.91–1.14) or LOS (mean difference = 0.001 days; 95% CI = -0.240 to 0.242).

### Conclusions

Mortality and LOS were stable across pre-shortage and shortage periods in patients with FN despite the national NS shortage. While such shortages may disproportionately impact patients with conditions that rely heavily on supportive fluids and rapid intravenous medication administration, this study did not observe statistically significant negative impacts on patient outcomes.

Student research funding was provided by  
Scholars Fellowship Award, School of Medicine Greenville

# Brandon Stiff, BS

## Session 2 Abstract 14



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### Mentor

Joanna R. Appel, PhD

## Bridging Recall and Application Through the Development and Validation of the Clinically Integrated Reasoning and Core Anatomy (CIRCA) Assessment Using Generative-AI



### Background/Purpose

Traditional anatomy assessments emphasize recall and identification, often failing to represent students' ability to apply knowledge in clinical scenarios. To address this gap, we developed the Clinically Integrated Reasoning & Core Anatomy (CIRCA) Assessment, incorporating generative AI to create clinically relevant anatomy questions. Additionally, we examined how medical students' learning approaches, as measured by the revised Approaches to Learning and Studying Inventory (ALSI), correlate with performance on CIRCA and traditional anatomy assessments.

### Methods

CIRCA items were generated by ChatGPT, Gemini, and Copilot using a standardized protocol to create 20 vignette-based multiple-choice questions and 20 spot-test questions each based on curriculum structure lists. Faculty, student, and clinician reviews refined the pool to 34 validated questions. 21 M2 students completed the surveys, and their data was analyzed alongside de-identified anatomy exam data, including traditional anatomy performance (TAP) scores, which were calculated averages of anatomy-specific summative exam questions and lab practical exams. The data was analyzed using descriptive statistics and correlational analyses.

### Results

CIRCA Spot demonstrated acceptable reliability ( $\alpha = 0.72$ ) and stronger correlations with overall anatomy performance. Total CIRCA showed questionable reliability ( $\alpha = 0.68$ ) but a significant correlation with TAP ( $p = 0.05$ ). CIRCA MCQ was shown to have poor reliability and no correlation with performance. ALSI analysis revealed learning approaches related to Monitoring Studying had positive correlations with CIRCA, as well as Effort Management/Organized Studying correlating with TAP. These findings suggest that specific adaptive learning behaviors, especially those related to monitoring, deep engagement, and study organization, may be more predictive of anatomy performance than broader ALSI factor scores alone.

### Conclusions

CIRCA was developed to integrate clinical reasoning into anatomical assessment and demonstrate the potential of generative-AI in question design. This novel, validated framework extends beyond recall and into application, showing a promising approach to student evaluation and assessment of clinical reasoning.

Student research funding was provided by  
Scholars Fellowship Award, School of Medicine Greenville

# Ethan Stoll, BS

Session 2  
Abstract 47



## Authors

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## Mentor

Jennifer Grier, PhD

## Identification of Fc Receptor Expression on Human Spermatozoa



### Background/Purpose

Infertility effects nearly 20% of child-bearing age couples worldwide, with the male partner being the main factor in one-quarter of these cases. Fc receptors (FcRs) are a family of cellular surface protein receptors that bind the Fc-portion of immunoglobulins (Ig) and mediate a myriad of cellular effector functions triggered via signal transduction into the intracellular space leading to alterations of cellular metabolism and release of chemical messengers. However, very little work has studied FcR presence on the surface of spermatozoa.

### Methods

In this study, the expression of five members of the FcR family were analyzed on human spermatozoa via spectrophotometry and flow cytometry utilizing 27 patient specimens previously used for in vitro fertilization (IVF). Human spermatozoa were stained with fluorescently labeled antibodies against human FcR CD16, CD64, CD32 (IgG FcR), CD89 (IgM FcR), FAIM3 (IgM FcR), and their respective isotype controls. An Fc blocking agent was used in all samples to prevent non-specific antibody binding. For each sample, relative fluorescence units (RFU) and median fluorescence intensity (MFI) were obtained by spectrophotometry and flow cytometry, respectively.

### Results

We have demonstrated that human spermatozoa possess Fc receptors on their cellular surface and bind immunoglobulins with specificity, especially CD16 (Fc<sub>γ</sub>R1) an activating receptor specific for IgG. RFU and MFI values of spermatozoa stained with anti-CD16 antibodies are statistically significant from its isotype control.

### Conclusions

While independently novel, these findings lay the foundation for future spermatozoa research. We aim to investigate the association of spermatozoa FcR expression on IVF clinical outcomes and their functional significance of. Due to their wide array of functions, FcRs have great potential as therapeutic targets for many complex pathologies. In depth understanding of spermatozoa FcR expression, immunoglobulin binding to these receptors, and their combined impact on fertility outcomes could revolutionize the evaluation and treatment of male infertility.

Student research funding was provided by

ASPIREinG Grant Funding

STUDENT RESEARCH  
SYMPOSIUM

# Lexi Stone

Session 1  
Abstract 106



## Authors

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## Mentor

Christine Schammel, PhD

## The Sweet Spot: An Algorithm Approach to Optimize TPN Orders



### Background/Purpose

Neonatal hyperglycemia is a common issue in Low Birth Weight infants. Total parental nutrition is often ordered to kickstart neonates' metabolism; however, infusion of these high dextrose concentrations risks exacerbating elevated blood glucoses. Careful management and monitoring of blood glucose are essential to prevent adverse outcomes. The purpose of this project is to utilize an algorithm (based on 10,000 data-points) to suggest a daily percent dextrose for the total parental nutrition order based on birth weight and glucose tolerance and evaluate the algorithm for clinical utility.

### Methods

We conducted a prospective study involving neonates receiving total parenteral nutrition (TPN) during the first 7 days of life. An algorithm was used to generate glucose management recommendations, which were presented to the clinical team in real time. Physicians had the opportunity to accept or reject each algorithm-suggested value and to provide a brief rationale for any rejections.

### Results

We found that the glucose management suggestions for neonates on TPN were frequently rejected by clinicians who perceived them as overly aggressive and potentially likely to induce hyperglycemia.

### Conclusions

Incorporating GIR and other relevant clinical parameters into future versions of the algorithm may enhance its accuracy and clinical acceptability in managing neonatal glucose tolerance.

STUDENT RESEARCH  
SYMPOSIUM

Student research funding was provided by  
Scholars Fellowship Award, School of Medicine Greenville

# Evan Stravolo, BA

Session 2  
Abstract 30



## Authors

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## Affiliations

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## Mentor

Mirinda Ann Gormely, PhD, MSPH

## Effectiveness of Prehospital Blood Administration in Pediatric Populations: A Scoping Review Protocol



### Background/Purpose

Prehospital blood administration (PBA) is a life-saving intervention in emergency medical services (EMS) for trauma and medical resuscitations, yet inclusion of pediatric patients in PBA protocols and evidence supporting PBA effectiveness in this population remain unclear. Our scoping review maps existing literature on PBA in pediatrics, identifying key characteristics of protocols and common outcomes assessed.

### Methods

PubMed, CINAHL, MEDLINE, and Scopus were searched from database inception through June 1, 2025. We included any study design or media article written in English describing PBA provided by EMS via ground or air ambulance. Titles, abstracts, full-text selection and data extraction were performed independently by two authors and assessed by percent agreement (PA), a third author resolved disagreements. A standardized spreadsheet extracted location and operational characteristics from each source and identified sources discussing pediatric ( $\leq 16$  years) populations by assessing: inclusion of pediatrics in eligibility/exclusion criteria, inclusion of pediatrics in population, specialized protocols for pediatric blood administration, outcomes assessed for pediatrics, and outcome results. Data were synthesized and qualitatively summarized. Methods were performed following the Preferred Reporting Items for Systematic Reviews and Meta-Analyses extension for Scoping Reviews.

### Results

Investigators reviewed 3,813 titles (PA=91.2%); 256 abstracts (PA=83.9%) and 128 full texts (PA=85.0%). Ninety-seven were chosen for data extraction (PA=86.0%). Of 57 studies reporting results from a PBA program, 7 (12.3%) excluded pediatrics, 19 (33.3%) did not exclude pediatrics in eligibility/exclusion criteria but did not include them in the analysis and 31 (54.4%) included pediatrics. Of those 31, less than one-third (10, 32.3%) assessed outcomes disaggregating pediatrics from adults; occurring primarily in the USA (60.0%) with sample sizes from 10-559. Five studies reported 30-day mortality or hospital/intensive care unit (ICU) length of stay, with two studies comparing pediatric PBA recipients to a control group. Our ability to synthesize findings was limited due to small sample sizes, heterogeneity in the population, PBA protocol, and EMS operations, and variability in outcome definitions.

### Conclusions

Our findings show a significant paucity of pediatric-specific evidence supporting PBA. Pediatric populations must be included in robust studies of PBA to inform evidence-based guidelines for prehospital pediatric trauma and medical resuscitation.

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STUDENT RESEARCH  
SYMPOSIUM

# Isabel Stringfellow, BS

Session 2  
Abstract 15



## Authors

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## Mentor

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## Building Empathy through Polypharmacy Simulation (BEPS)



### Background/Purpose

In the United States, rates of polypharmacy are estimated to be as high as 65% for adults aged 65 years and older. Medical students who have not experienced chronic medical conditions, or who are not caregivers for those with chronic conditions, may not fully understand the relentlessness of the condition management and polypharmacy burden. Thus, there is a concerted effort in medical education to provide context and develop the emotional intelligence of students. The current study seeks to provide this type of empathy training by exposing students to a polypharmacy simulation.

### Methods

The goal of this study is to show an increase in empathy across all years of medical students by exposing students to a polypharmacy treatment regimen. Students will be given seven simulated medications (colored candy) with different administration schedules, determined in conjunction with faculty as common medications for polypharmacy patients. Participants will attempt to take these medications as prescribed for a week, and empathy will be measured through pre- and post-intervention surveys using the Kiersma-Chen Empathy scale.

### Results

Our initial group was comprised of ten second-year medical students at the University of South Carolina School of Medicine Greenville (USC SOMG), with six completing the simulation in its entirety. Overall, the preliminary results suggest that polypharmacy simulation leads to an increased awareness of the difficulty of medication adherence. On a seven point Likert-scale participants rated the simulation as more difficult than anticipated ( $5.3333 \pm 0.826$ ).

### Conclusions

The initial group has given the impression that this simulation exercise was difficult to complete with perfect adherence to the prescribed regimen. We plan to continue this work with medical students in other years of training (M1, M3, M4) and continue to develop this simulation exercise. We also expect insights from the students on how they will approach medication adherence challenges with their future patients.

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STUDENT RESEARCH  
SYMPOSIUM

# Gillian Sweeney, BS

Session 2  
Abstract 43



## Authors

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## Mentor

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## Geospatial Visualization of Social Determinants of Health in Greenville County, South Carolina: Toward Understanding Pediatric Respiratory Infection Risk



### Background/Purpose

Acute respiratory infections, specifically Respiratory Syncytial Virus (RSV) and SARS-CoV-2, are one of the leading causes of illness and mortality in the pediatric population globally. Social determinants of health (SDOH) are the conditions in which an individual was born and lives that impact their access to resources. SDOH likely play a key role in the susceptibility and severity of RSV and SARS-CoV-2 infections in the pediatric population of Greenville County, South Carolina.

### Methods

Five SDOH (tobacco smoke, median income, insurance status, single-parent households, and education status of parents) were selected from five categories respectively representing Neighborhood and Built Environment, Economic Stability, Healthcare Access and Quality, Social and Community Context, and Education Access and Quality. Data was retrieved from the U.S Census Bureau in 2020 and compiled for import into ArcGISOnline. Each determinant was mapped separately and compiled into a heatmap overlay for comparison. Data from Greenville County Prisma Health facilities was collected for pediatric patients with a positive RSV or SARS-CoV-2 test result. The prevalence of disease will be mapped by population zip code and compared to the SDOH.

### Results

Preliminary results demonstrate that zip codes 29611, 29683, 29661, and 29635 are the most significantly impacted by the combined SDOH studied in Greenville County. It is predicted that the zip codes most affected by social determinants will also have the highest prevalence of pediatric RSV and SARS-CoV-2 infections. Combinations of social determinants will be evaluated to determine which factors are most associated with respiratory infections.

### Conclusions

Significant disparities of SDOH exist in Greenville County and these determinants may correlate with pediatric RSV and SARS-CoV-2 infections. Identifying these and areas impacted by disparities within Greenville County will provide insight into factors directly affecting pediatric health and may serve as the starting point for important conversations around public health interventions in Greenville County.

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Scholars Fellowship Award, School of Medicine Greenville

STUDENT RESEARCH  
SYMPOSIUM

# Karl Swiger, BS

## Session 1 Abstract 63



### Authors

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### Mentor

John David Adams Jr., MD

## Morbidity and Mortality in Older Adults with Ankle Versus Hip Fractures: A Multi-Institutional Retrospective Study



### Background/Purpose

Fragility fractures in older adults often lead to loss of independence and increased morbidity and mortality (M&M). Hip fractures are typically treated surgically to allow immediate weight bearing, whereas ankle fractures are often managed with prolonged immobilization, which may worsen outcomes. This study aims to characterize short- and long-term morbidity and mortality in elderly patients with ankle fractures and examine the association of weight-bearing status and treatment approach (surgical vs. conservative) with recovery and survival. Ankle fracture data from participating institutions will be compared with existing hip fracture data.

### Methods

This multi-institutional retrospective chart review will include patients  $\geq 60$  years old treated for ankle fractures at Greenville Memorial Hospital and collaborating centers. Eligible ankle fractures are identified by CPT codes (e.g., 27792). Exclusion criteria include intraarticular ankle fractures, history of total ankle arthroplasty, prior ankle fracture fixation, bilateral ankle fractures, additional injuries requiring surgical intervention, and active cancer. Data extracted from the electronic medical record include demographics, comorbidities, fracture characteristics, treatment modality, weight-bearing status, orthopedic and medical complications, 30-day readmissions, time to union, and mortality. De-identified data will be stored in a secure REDCap database. Comparative analyses will evaluate M&M outcomes and the association of mobilization strategy and treatment modality with complications and survival.

### Results

Data collection and enrollment are ongoing, with an anticipated review of approximately 500 records. Baseline demographic and treatment data will be summarized at presentation; final morbidity and mortality analyses are not yet complete.

### Conclusions

By characterizing differences in morbidity, mortality, and complication rates between elderly patients with ankle and hip fractures, and exploring how weight-bearing status and treatment approach relate to these outcomes, this study aims to clarify key prognostic factors in a high-risk population. The findings will provide a foundation for future prospective trials and may guide clinicians in balancing surgical versus conservative strategies and mobilization protocols to improve patient-centered care.

Student research funding was provided by  
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# Yash Verma

Session 2  
Abstract 107



## Authors

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## Mentor

Jennifer T. Grier, Ph.D.

## Gene Expression Profiles of Human Macrophages Reveal Insights into Pathogenesis of Necrotizing Fasciitis-associated *Acinetobacter baumannii*



### Background/Purpose

*Acinetobacter baumannii* is an opportunistic nosocomial pathogen of concern due to its increasing pan-drug resistance and growing recognition in its involvement in necrotizing fasciitis (NF), a severe soft tissue infection with high morbidity if untreated. Some NF associated strains of *A. baumannii* (NFAb) exhibit an ability to survive within human macrophages. However, macrophage response to intracellular infection by these strains is not well understood. Understanding the macrophage transcriptional response to NFAb infection may help us uncover new immune evasion mechanisms and inform future therapies.

### Methods

Human monocyte-derived THP-1 macrophages were infected with two NFAb strains (NFAb1 and NFAb2) or the reference strain ATCC 19606T at a MOI of 100. After 2 hours of infection and colistin protection assay, intracellular bacteria were quantified and total macrophage RNA was collected and subjected to RNA-sequencing (RNA-seq). Differential gene expression analysis was performed using the DESeq2 package in R and gene ontology analysis was used to evaluate enriched immune pathways.

### Results

RNA-seq identified distinct transcriptional signatures in response to infection with NFAb strains compared to the reference strain. Pro-inflammatory genes like TNF, CCL4 and IL1B were upregulated in response to NFAb infection, indicating heightened immune activation. Genes related to immune regulation and signaling like CX3CR1 and GPRIN3 were downregulated across all strains. This may indicate disruption of communication pathways. Genes involved in microtubule associated proteins and intracellular trafficking were also upregulated, suggesting a role for macrophage phagocytosis in intracellular bacterial infection.

### Conclusions

This study sheds light on transcriptional responses of human macrophages to *A. baumannii* infection, especially in the context of NF. Responses to NFAb strains were characterized by altered signaling regulation and increased inflammation, suggesting NFAb strains may survive intracellularly by triggering and modulating host immune pathways. Understanding these mechanisms may provide us with novel targets for future therapeutic interventions against multidrug resistant *A. baumannii* infections.

# Yash Verma

## Oral Presentation Abstract 34



### Authors

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### Mentor

Leah Robinson, Ph.D.



## Evaluating the Effectiveness of Sunscreen Dispensers in Promoting Sunscreen Use Among Medical Students

### Background/Purpose

Skin cancer is the most common cancer in the USA, with one in five Americans affected in their lifetime. Regular use of broad-spectrum (SPF 30+) reduces the risk of sunburn, photoaging, and malignancies. However, adherence remains inconsistent due to barriers including cost, inconvenience, and forgetfulness. Free sunscreen dispensers increase accessibility, but their use in academic settings has been limited. This study evaluates whether sunscreen dispensers can promote sun safety behaviors amongst medical students.

### Methods

Two free sunscreen dispensers were installed in high-traffic areas at USCSOMG. Before installation, students were invited to complete a baseline survey; 103 responded (23.8% response rate). Three months later, the same cohort was asked to complete a follow-up survey; 22 responded (21.4% of baseline participants). Surveys were distributed via institutional emails and consisted of multiple-choice and Likert-scale questions assessing use, attitudes, barriers, and dispenser utilization.

### Results

The pre-survey (N=103) found 35.9% of students used sunscreen daily, while 40.8% reported occasional use. Common barriers included forgetfulness (58.3%), inconvenience (35.9%), and dislike of texture (34.0%). Nearly half (44.7%) indicated they would be more likely to use sunscreen if it were more freely available. In the post-survey (N=22), daily use was 27.3%, and 31.8% reported using the dispensers. Non-use was largely due to preference for personal sunscreen (50%) and forgetfulness (31.8%). Perceived accessibility improved, with 81.8% agreeing sunscreen was now easily available.

### Conclusions

Free sunscreen dispensers improved perceptions of accessibility among medical students but had limited impact on overall use. Persistent barriers (forgetfulness and preference for personal sunscreen) reduced uptake. These findings suggest additional education and reminders may be needed to maximize program effectiveness. Interpretation is limited by low post-survey response rate, which may have been influenced by survey timing at the end of the academic year.

# Tamia Ward, BS

## Session 1 Abstract 21



### Authors

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### Mentor

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## Comparative Sex and Gender Outcomes in Response to Exercise Interventions in Adults with Obesity: A Systematic Review



### Background/Purpose

Obesity is a prevalent global health concern associated with increased risk of metabolic, cardiovascular, and musculoskeletal disorders. Exercise is an essential element of obesity management, yet individual responses to different exercise modalities may vary. This systematic review aims to examine whether sex and gender influence exercise outcomes in adults with obesity, with the goal of optimizing tailored exercise interventions.

### Methods

A systematic search strategy is being conducted across Cochrane, PubMed, and EMBASE, SPORTDiscus, and CINAHL databases. Studies considered include randomized controlled trials, meta-analyses, and clinical trials published within the last 10 years. Only adults between the ages of 18 and 65 years old with a BMI of 30 or greater will be included. All structured exercise interventions will be included: HIIT, strength training, aerobic exercise, etc. Outcomes of interest are weight loss, percentage body fat, waist circumference, BMI, and cardiovascular health. Covidence will be used for article screening, de-duplication, and data extraction. Risk of bias will be assessed using Cochrane tools and AMSTAR2. All findings will be synthesized narratively.

### Results

Screening and data extraction are ongoing. Results will include the number and types of studies identified, population demographics included, intervention types, and analyses of outcomes by sex and gender.

### Conclusions

This review will provide a comprehensive analysis of the evidence on sex and gender based differences in outcomes among adults with obesity. Identifying any existing evidence of differing outcomes will translate to more personalized exercise regimens, clinical guidelines, and better overall recommendations for obesity maintenance. Pending results, this study may bridge gaps in the literature and inform future research directions aimed at optimizing exercise prescriptions for individuals living with obesity.

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# Jake Williams, BS

## Session 2 Abstract 26



### Authors

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### Mentor

Arwen Declan, MD, PhD

## Covidence - A Valuable Platform for Systematic and Scoping Reviews



### Background/Purpose

Systematic and scoping reviews are essential tools for integrating scientific evidence. These reviews often involve large teams and heavy workloads; since review processes are largely standardized, workflow management can be simplified with a structured digital platform. The world's largest systematic review tool, Covidence, uses an online platform to streamline workflow, consolidate information, and display results. It offers a straightforward, effective approach to team management and evidence generation; it is available via the University of South Carolina (USC) license but has not been used extensively at USCSOMG. Here, we share our experience using Covidence for a scoping review.

### Methods

We used Covidence to complete a team-based scoping review across sequential stages, basing our methods on Arksey & O'Malley and the JBI Scoping Review. After developing our search strategy with the librarians, we imported the articles into Covidence for title and abstract screening. Full text review was completed within Covidence. We customized a data extraction template in Covidence and completed data extraction. Covidence includes comparative features to indicate consensus; it also offers functions for flagging articles or adding notes. Reviews completed in Covidence can be rapidly reported in a PRISMA reporting diagram using built-in functions; extracted data can be rapidly exported into table format for publication.

### Results

We found Covidence to be an efficient, user-friendly structured digital framework. Our team found the tagging and note features to be helpful for team communication and achieving consensus. We found the online platform useful for asynchronous teamwork, since our team is distributed across multiple institutions.

### Conclusions

Covidence is a structured digital platform for systematic and scoping reviews. We found the Covidence platform to be an efficient, user-friendly interface for managing our distributed, asynchronous team workflow. The Covidence platform, available through USC, offers a helpful tool for researchers seeking to efficiently synthesize evidence for publication via scoping and systematic reviews.

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# Jeffrey Woodward, BS

## Session 2 Abstract 81



### Authors

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### Mentor

Ann Blair Kennedy, DrPH

## REFLECT: A Creative Approach to Centering Patient Identity in Research



### Background/Purpose

Understanding the role of patients as research partners is essential for meaningful engagement and sustainable researcher-patient partnerships. Evidence shows beyond lived experiences, personal identities, and motivations shape patients' contribution to research, however, tools to understand these factors are lacking. In this project, we explore a novel participatory method to capture layered identities and lived experiences of patients, researchers, and collaborators in the USC Patient Engagement Studio (PES) through personalized word portraits.

### Methods

This study employs an exploratory mixed-methods design using participatory approaches to co-develop and pilot a novel tool for visualizing the layered lived experiences of patient partners and other PES Stakeholders. Data collection is ongoing, however, participants opted in by completing a researcher developed survey where they identified descriptive words and assigned importance weights to demographic categories. These responses were used to generate individualized and group-level word portraits. Participants reviewed and edited individualized word portraits through written feedback or during editing sessions to ensure accurate representation of their identities. Participants will be invited to a final group meeting to present their individual portrait and review the group portrait. Reflections from the meeting will be analyzed thematically.

### Results

Of the individual word portraits, 45 were generated, 10 requested revisions, 5 were revised over Zoom, and 5 were revised through email. Several participants sought clarification on the context and application of the individual portraits. Several participants noted their portrait would likely change depending on their role, subject matter, stage of research process, or additional change in context.

### Conclusions

By promoting identity-centered reflection and representation, the word portrait method advances the science and practice of inclusive, reflexive patient engagement by recognizing intersectional contexts, diverse identities, and lived experiences from individuals as well as group perspective. Future inquiry should examine how completion of this activity affects the involvement/retention of participants within the PES and patient-center research.

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# Matthew Zirkle

Session 2  
Abstract 98



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## Mentor

Mary Blumer, MD

## The Impact on Emergency Department Visits after Education on the Utilization of After-Hours Triage in the Internal Medicine Clinic Population



### Background/Purpose

The primary care provider plays a significant role in reducing the burden on the hospital healthcare system, not only by providing preventive care to decrease hospitalizations, but also to alleviate the undue stress of non-emergent visits to the emergency department. The main goals of this study are to investigate the Internal Medicine Clinic (IMC) population's knowledge and use of an after-hours triage line and same-day sick visits then to determine if education of these resources and prior contact with the outpatient setting will decrease this population's number of emergency department visits.

### Methods

We are first conducting a retrospective chart review to determine how often our clinic patients are being seen in the emergency department and if prior contact via telephone encounter or clinic visit was made prior to presentation. We picked a population of 31 IMC patients with the highest ED utilization based on an Epic report of medical record numbers (MRNs) spanning 2019-2021.

### Results

Following our initial collection of MRNs, we excluded 6 patients who did not have regular access to dialysis and were followed closely in our clinic. The remaining 25 highest ED utilizing patients combined for 476 ED visits without an immediately noticeable pattern of presentation.

### Conclusions

N/A; work in progress. Next steps outlined below: We will look at the characteristics of this population of "high utilizers" to determine common variables such as comorbidities and control of those disease processes, social determinants of health (SDoH), and other factors that might play a role in their frequent ED encounters. Next steps include further chart review to determine if the primary diagnosis in the ED could have been managed in an outpatient setting and if prior contact was made before presentation. We will then survey the top ED utilizing patients to evaluate knowledge of the triage line and sick visit availability, survey IMC providers regarding their knowledge and discussion of these resources with patients, supply education for both providers and patients regarding these resources, and revisit the data to determine if IMC patients' non-urgent visits to the ED is reduced.

Student research funding was provided by  
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# Nicholas Zullo

Session 1  
Abstract 46



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## Hybrid Academic/Community Cellular Therapy Program and Incidence of CAR-T Adverse Events: A Retrospective Chart Review

### Background/Purpose

Chimeric antigen receptor (CAR)-T cell therapy involves modifying host T cells to destroy cancer cells with high specificity via the induced expression of the CAR surface protein (Sun et al., 2024). This breakthrough technology poses a risk for identifiable adverse events such as cytokine release syndrome (CRS), immune effector cell-associated neurotoxicity syndrome (ICANS), cytopenias, and infections (Adkins, 2019). There is a need to generate generalizable knowledge in predicting the incidence of these toxicities, best practices for toxicity management, and the impact on patient outcomes.

### Methods

An ongoing retrospective secondary data analysis being conducted in the Prisma Health Cancer Institute Cellular Therapy Program has previously reported a preliminary assessment of the the study (Curtis et al., 2025). Data for this assessment will include specific laboratory trends, incidence of CRS and ICANS, and cancer related outcomes at various time points.

### Results

This assessment of the data will focus on trends of specific laboratory values including: c-reactive protein (CRP), ferritin, platelets, absolute lymphocyte count (ALC), and lactate dehydrogenase (LDH). The association of these laboratory trends with outcomes (incidence of CRS and ICANS, treatment response, disease progression, and mortality) will be examined at Day 100, Day 200, and Year 1. Statistical analyses to be utilized will include descriptive statistics and logistic regressions. Data collection is ongoing.

### Conclusions

This study will provide insight into the incidence and predictors of CAR-T therapy adverse events in a hybrid academic/community setting. In addition to contributing to generalizable knowledge, it will inform the patient care and safety in the Cellular Therapy Program at Prisma Health.

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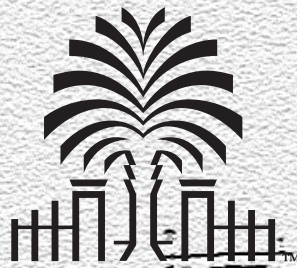
We would also like to thank the Peabody Foundation, and all other donors for their generous support of our medical students.

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# **7th Annual Student Research Symposium**



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