



Center for Clinical and  
Translational Science

**20<sup>th</sup> Annual CCTS Spring Conference**

**Pioneering Pathways: Innovative Trial  
Design in Translational Science**

**Tuesday, April 1, 2025  
Central Bank Center**

**ABSTRACT BOOK**

# 20<sup>th</sup> Annual CCTS Spring Conference

Tuesday, April 1, 2025

Central Bank Center

## Poster Index - Groups

| <b>Group</b>                                    | <b>Poster Numbers</b> |
|---|-----------------------|
| Frederick Douglass High School Students         | 1-22                  |
| CCTS  | 23-114                |
| Institute for Biomedical Informatics            | 115-119               |
| College of Medicine                             | 120-193               |
| Department of Internal Medicine                 | 194-233               |
| College of Engineering – Biomedical Engineering | 234-241               |
| College of Public Health                        | 242-255               |
| College of Health Sciences                      | 256-308               |
| College of Nursing                              | 309-348               |
| College of Dentistry                            | 349-387               |

# 20<sup>th</sup> Annual CCTS Spring Conference

Tuesday, April 1, 2025

Central Bank Center

## POSTER NUMBER INDEX

| Poster Number | Last Name  | First Name | Title   |
|---------------|------------|------------|---|
| 55            | Abdelkader | Nada       | Phenotypic and Genotypic Characterization of Antimicrobial Resistance of Salmonella Infections in Cattle.               |
| 78            | Adams      | Joshua     | Growing Together: Enhancing Elderly Wellness in Rural Communities   |
| 323           | Adams      | Taylor     | Evaluating The Effectiveness of Social Determinants of Health Screening in an Interdisciplinary Clinic                  |
| 309           | Adamski    | Mia        | Covid-19 Vaccine Uptake and Vaccination Attitudes by Age and Gender   |
| 104           | Adesiyan   | Raphael    | Exploring Risk and Protective Factors of E-cigarette and Tobacco Use among African American Youth in the United States  |
| 310           | Adhikari   | Pranisha   | Comprehensive Support Plan for Sexual Assault Survivors   |
| 64            | Ahmad      | Haseeb     | Glucose Dysregulation Leads to Development of Malignant Cerebral Edema Following Thrombectomy in Acute Ischemic Stroke  |
| 215           | Akbar      | Rubab      | Asprosin is a Hypertensive Adipokine  |
| 234           | Akbari     | Faezeh     | Programmable Scanning Diffuse Speckle Contrast Imaging (PS-DSCI) of Cerebral Blood Flow                                 |
| 340           | Alhusban   | Islam      | Are Females with Metabolic Syndrome at Greater Risk of Oxidative Stress and Its Contributing Factors Than Males?        |
| 185           | Alrefai    | Yazan      | When the Judge Makes the Diagnosis: A Case of Panhypopituitarism due to Empty Sella in a Police Officer                 |
| 96            | Alsiraj    | Yasir      | High-Fat Diet in Early Life Primes Hepatic and Vascular Responses to Sepsis in a Pediatric Murine Model                 |
| 91            | Anderson   | Emma       | Asprosin's Emerging Role in Thermal Pain Modulation   |
| 298           | Anderson   | Hannah     | Rural Roots, Rural Practice: Exploring the Influence of Geographic Background on Physician Assistant Career Preferences |
| 158           | Andrews    | Reya       | Social Determinants of Whole-Food, Plant-Based Diet Adoption Among Individuals at Risk for Cardiovascular Disease       |

# 20<sup>th</sup> Annual CCTS Spring Conference

Tuesday, April 1, 2025

Central Bank Center

## POSTER NUMBER INDEX

| Poster Number | Last Name   | First Name       | Title   |
|---------------|-------------|------------------|---|
| 349           | Andriankaja | Oelisoa Mireille | Systemic Inflammation, Endothelial Dysfunction, and the Risk of Increased Periodontal Pocket Depth: the SOALS Study     |
| 65            | Anil        | Neha             | Expression of Dementia Biomarkers in Appalachian and Non-Appalachian ELVO Patients during Thrombectomy                  |
| 383           | Anjary      | Amr              | Virtual Orthodontic Treatment to Accurately Plan Dental Implant for Orthodontic Anchorage                               |
| 218           | Anspach     | Garrett          | Liver-specific CPT1a Deletion Promotes Tumorigenesis in a Mouse Model of Obesity-driven Hepatocellular Carcinoma        |
| 303           | Arena       | Cori             | Examining Comorbid Conditions in College Students Diagnosed with ADHD pre- vs. post-COVID                               |
| 353           | Ash         | Peyton           | Chronic Overlapping Pain Conditions Predict Pain Intensity and Fatigue in Young Adults with Temporomandibular Disorder  |
| 12            | Ashly       | Romero           | Lung Cancer Mortality in Kentucky: Analyzing Smoking Trends and Regional Variations                                     |
| 252           | Aung        | Khine Zin        | Unveiling the overlooked: Multiallelic Variants in Brain Arteriosclerosis   |
| 341           | AWAL        | ISSAHAKU         | Differences in Patient-Centered Outcomes Between Patients with Heart Failure and With and Without Renal Dysfunction     |
| 151           | Bahrani     | Ahmed            | White Matter in Flux: Investigating Structural Changes in WMH Growth and Regression: MRI study                          |
| 150           | Baker       | Mindy            | Clinical and Radiological Differences in Diagnosing CLIPPERS Among Other Autoimmune Neurologic Disorders                |
| 15            | Banther     | Keenan           | Descriptive Epidemiology of Pancreatic Cancer   |
| 164           | Barré       | Alyssa           | Leukemic Arthritis Mimicking Septic Arthritis in a Pediatric Patient: A Case Report                                     |
| 2             | Barrow      | Lainey           | Analysis of Bladder Cancer in the United States: Investigating the Impact of Gender, Age, and Geography.                |
| 339           | Baser       | Louis            | Barriers to Participation in Formal Support Groups for Sexual and Gender Minority Cancer Survivors: A Systematic Review |
| 237           | Bates       | Madison          | Validation of a Wearable Sensor-Based Device for Objective Characterization of Hand Function                            |

# 20<sup>th</sup> Annual CCTS Spring Conference

Tuesday, April 1, 2025

Central Bank Center

## POSTER NUMBER INDEX

| Poster Number | Last Name   | First Name | Title   |
|---------------|-------------|------------|---|
| 160           | Baxter      | Mary       | Perimetry Results with VirtualField's Virtual Reality Program are Comparable to the HFA-III                             |
| 204           | Beckner     | Zach       | Effects of Amitriptyline on the Glucoregulatory Response in a Rodent Model of Hypoglycemia-Associated Autonomic Failure |
| 256           | Bennett     | Tina       | Non-Emergent Use of the ED by UK Internal Medicine Group Patients   |
| 92            | Bhavsar     | Ravi       | Using Near Infrared Spectroscopy (NIRS) to Assess Pain in Neonates undergoing Circumcision- A Pilot Study               |
| 231           | Bianchini   | Katie      | Post-ICU Vulnerability: How Age and Living Alone Influence Quality of Life  |
| 162           | Bird        | Joel       | Materials in Shoulder Arthroplasty 1 - Historical Evolution   |
| 163           | Blank       | Libby      | From Likes to Rankings: How Social Media Can Predict Orthopaedic Surgery Residency Proximity Rank                       |
| 11            | Bobbitt     | Ivory      | Kentucky's Lung Cancer Epidemic: By the Numbers   |
| 193           | Bobo        | Clayton    | Geographic Disparities in Naso-Orbital-Ethmoid Fractures: Injury Patterns, Care Delivery, and Clinical Outcomes         |
| 325           | Bourgeois   | Amanda     | Improving Nutrition Screening Practice in the Hospitalized Heart Failure Patient Population                             |
| 152           | Brandenburg | Spencer    | Liquid Embolic MMA Embolization Leads to Earlier Symptom Resolution in cSDH Compared to PVA Particles                   |
| 311           | Brewer      | Kelsie     | Breaking the Chain: Supporting Pregnant Women Throughout Incarceration and Substance Use                                |
| 312           | Brown       | Haley      | Prenatal Depression Symptoms Affecting Breastfeeding Outcomes in Hispanic Women   |
| 114           | Bryant      | Lindsay    | Atypical Phenotypic Presentation in a Patient with Alpha-thalassemia X-linked Intellectual Disability (ATR-X) Syndrome  |
| 355           | Bryant      | Jessie     | Investigating Emergency Department Use for Non-Traumatic Dental Conditions in Kentucky: A Study on Social Vulnerability |
| 16            | Bueno       | Kenneth    | Epidemiology of Prostate Cancer in the U.S.: Incidence Trends, Regional Disparities, and Screening Implications         |

# 20<sup>th</sup> Annual CCTS Spring Conference

Tuesday, April 1, 2025

Central Bank Center

## POSTER NUMBER INDEX

| Poster Number | Last Name      | First Name | Title  |
|---------------|----------------|------------|--|
| 38            | Bullens        | Kelsey     | Filtration or perspiration? RAAS may also alter transport processes in eccrine sweat glands                              |
| 128           | Buoncristiani  | Michael    | Leveraging Fucosyltransferase Inhibition to Impede MYCN-amplified Neuroblastoma Tumorigenesis                            |
| 248           | Burrows        | William    | Barriers and Facilitators to Treatment Adherence: An Exploration of the Lived Experience of Patients with Heart Failure  |
| 121           | Burton         | Abby       | Identifying Novel Strategies for HIV PrEP Care Implementation: Qualitative Findings Among Rural Syringe Services Program |
| 32            | Burus          | Todd       | Survival of Patients Diagnosed with Cancer in the US during the First Year of the COVID-19 Pandemic                      |
| 257           | Bush           | Gracelyn   | Cross-Cultural Insights into Professional Identity Formation Among PA Students: A Four Country Pilot Study               |
| 313           | Bush           | Brianna    | Fighting the Stigma and Improving Health Outcomes for Pregnant Women with Substance Use Disorder                         |
| 39            | Cai            | Lei        | Hypertriglyceridemia Promotes Aortic Aneurysm Formation and Rupture in Angiotensin II Infused Mice                       |
| 382           | Callister      | Samuel     | New Consideration for Using Limited-View Cone-Beam Computerized Tomography for Accurate Planning Guide Implant Surgery   |
| 155           | Carter         | Brian      | Analyzing Stress Reactions in Community-Dwelling Individuals with Alzheimer's Disease and Associated Behavioral Symptoms |
| 314           | Cartwright     | Ella       | Syringe Service Program: A Harm Reduction Approach for Nursing Practice  |
| 86            | Castro Jimenez | Juliana    | Changes in Resting Mechanotransduction Current Modify the Cytoskeleton Actin Composition in Auditory Hair Cells          |
| 371           | Chhadh         | Sarah      | Predicting Sizes of Stainless-Steel Crowns   |
| 165           | Chisholm       | Jacob      | Analysis of Implant Breakage in Shoulder Replacement   |
| 326           | Chroust        | Clayton    | Evaluating the Efficacy of a Progressive Mobility Protocol Among Adult ICU Patients                                      |

# 20<sup>th</sup> Annual CCTS Spring Conference

Tuesday, April 1, 2025

Central Bank Center

## POSTER NUMBER INDEX

| Poster Number | Last Name  | First Name | Title  |
|---------------|------------|------------|--|
| 242           | Ciaverelli | Sophie     | Comparing Cannabis Use Questions in National Surveys by Compiling Cannabis Use Repository                                |
| 23            | Clark      | Shelby     | Mandated Reporting/Community Supporting: Exploring Responses to Child Abuse and Neglect Reports                          |
| 115           | Clarkson   | Melissa    | Semantically-Augmented Graphic Libraries as Visual Standards for Anatomy and Phenotypes                                  |
| 122           | Cline      | Trey       | Examining the Relationship Between Cognitive Auditory Processing and Sex Hormones  |
| 324           | Cline      | Madelyn    | The Effect of a Hospital Community Garden on Healthcare Professional Quality of Life                                     |
| 376           | Cohen      | Sadie      | Comparison of the periodontal status among patients treated with clear aligners versus conventional orthodontics         |
| 268           | Cole       | Jill       | A Theoretical Framework for Research in Massage Therapy in Patients with Cancer  |
| 315           | Coleman    | Katherine  | Enhancing Pediatric Oncology Pain Management: Implementing Comfort Carts to Integrate Non-pharmacological Interventions. |
| 181           | Collins    | Katelyn    | Leveraging Managed Care Partnerships: Lessons Learned from Washington DC's Healthy Together Medical-Legal Partnership    |
| 161           | Comas      | Luis       | A Novel Technique for Glenoid Labrum Reconstruction: The GALIN Technique   |
| 135           | Conley     | Keenan     | ECMO as a Rescue Measure for Post Cardiomy Circulatory Collapse: A Single Center Experience                              |
| 368           | Conlin     | Murphy     | Water Sorption and Solubility of New Resin Infiltrate  |
| 70            | Conner     | Cate       | Amylin Dysregulation Exacerbates Behavioral Differences in Transgenic ApoE Mice  |
| 292           | Cord       | Landon     | Head Over Hoof: Concussion education and relationships to age and occupation in the horseracing industry                 |
| 56            | Curry      | Hunter     | Treatment Outcomes in Deep-Seated Stenotrophomonas maltophilia Infections: Monotherapy versus Combination Therapy        |
| 123           | D'Orazio   | Julia      | DOI and Saline Injection into Rat Claustrum Reproduce Wet Dog Shake with Potential Anterior Cingulate Cortex Involvement |

# 20<sup>th</sup> Annual CCTS Spring Conference

Tuesday, April 1, 2025

Central Bank Center

## POSTER NUMBER INDEX

| Poster Number | Last Name      | First Name  | Title   |
|---------------|----------------|-------------|---|
| 327           | Dalton         | Ashley      | Evaluating the Utilization & Efficacy of Diet & Physical Activity Screening Tools for Adults with T2DM in Primary Care  |
| 217           | Daneshgar      | Nastaran    | Cdkn2a Variants exacerbate DNA Damage-Associated Myocardial Fibrosis in Various Cardiomyopathies                        |
| 258           | Daniels        | Hannah      | Disparities in Pulmonary Disease Prevalence: A Comparison of Rural and Urban Kentucky                                   |
| 156           | DAVARGAON      | RAVICHANDRA | Energy Homeostasis within the Brain is Negatively Affected by Diabetes-related Amylin Loss-of-Function                  |
| 82            | Dawahare       | James       | Isokinetic Analysis: Quadriceps Autografts Cause Weaker Extension, Stronger Flexion Than Hamstring Autografts Post-ACL  |
| 79            | Day            | Bridgette   | Impact of Moringa Oleifera Supplementation on Breast Milk Production in Lactating Mothers of Preterm Infants            |
| 10            | Deffendall     | Elizabeth   | Descriptive Epidemiology of Lung Cancer   |
| 129           | Denton         | William     | Efficacy of Transarterial Bland Embolization with Concurrent Everolimus for Hepatic Metastatic Neuroendocrine Tumors    |
| 130           | Denton         | William     | Everolimus with Bland Embolization: Impact on Survival and Hospital Length of Stay in Hepatic Neuroendocrine Metastasis |
| 141           | Desai          | Roma        | Access to Dermatological Care in Kentucky   |
| 206           | Devore         | Micah       | Metoclopramide Restores Counterregulation in Hypoglycemia: Preclinical and Early Clinical Findings                      |
| 227           | Dharanipragada | Nikitha     | Deletion of Carnitine Palmitoyltransferase 1a from Adipocytes Leads to Insulin Resistance in Female Mice                |
| 243           | Dickens        | Sara        | NPCS mission to make safety culture in the child welfare system.  |
| 186           | Ditka          | Chloe       | Outcomes of Aortic Valve Replacement for Infective Endocarditis: A Single-Center Experience                             |
| 328           | Douangdara     | Khay        | A Triage Process to Decrease Door to EKG Times for Adult Patients With Suspected Cardiac Abnormalities in the Emergency |



# 20<sup>th</sup> Annual CCTS Spring Conference

Tuesday, April 1, 2025

Central Bank Center

## POSTER NUMBER INDEX

| Poster Number | Last Name       | First Name   | Title   |
|---------------|-----------------|--------------|---|
| 45            | Draud           | Sarah        | Impact of antiplatelet therapy on diabetic retinopathy onset and progression  |
| 140           | Draud           | Sarah        | Improvement in Psoriasis after Discontinuation of Apremilast (Otezla)- Case Report                                    |
| 269           | Dredge          | Garry        | Basic Training to Discharge: Long-Term Effects of Bone Stress Injuries on Military Career and Healthcare utilization. |
| 71            | Driskill        | Olivia       | Differential Effect of $\alpha$ -Synuclein on Mitochondrial Morphology in PD and MSA                                  |
| 184           | Duvall          | John         | Treatment of OCP induced Hepatocellular Adenomas with Y90 radioembolization: A case study                             |
| 49            | Edwards         | Madison      | A Vision for the Future: Early Intervention in Title I Schools  |
| 287           | Eisner          | Charlie      | Autoregressive Modeling of Dynamic Gait Stability in Anterior Cruciate Ligament Reconstruction Across Rehabilitation  |
| 50            | Elam            | Carol        | A Cornerstone of the Primary Care Scholarly Concentration: The Primary Care Health Inequities and Delivery Course     |
| 351           | Elwany          | Nelly        | Artificial Intelligence in Dentistry: Perspectives from Social Media  |
| 33            | Esfini Farahani | Mohammad     | PLK1- Phosphorylation of OCT4 Induces Transdifferentiation of Neuro Endocrine Prostate Cancer from CRPC               |
| 57            | Faisal          | Golam Mahbub | Salmonella in Companion Animals as a Public Health Threat Due to Multidrug Resistance                                 |
| 372           | Faltas          | Bridget      | Comparison Between Two Types of Collagen Matrices to Treat Single Gingival Recession: a Data Reanalysis               |
| 235           | Fathi           | Faraneh      | Noninvasive Optical Imaging of Cerebral Blood Flow (CBF) Response to Intracranial Pressure (ICP) Elevation            |
| 51            | Felkins         | Shawna       | TEK Faculty Fellows: Building Faculty Capacity for Teaching Durable Skills through Transdisciplinary Collaboration    |
| 219           | Fine            | Rebecca      | Evaluation of Privacy-Focused Endoscopy Data Extraction Using a Lightweight Open-Source Local Language Model          |

# 20<sup>th</sup> Annual CCTS Spring Conference

Tuesday, April 1, 2025

Central Bank Center

## POSTER NUMBER INDEX

| Poster Number | Last Name         | First Name       | Title   |
|---------------|-------------------|------------------|---|
| 166           | Fleisher          | Christopher      | Intraoperative Platelet-Rich Plasma Reduces Tendon Re-Tears Following Rotator Cuff Tendon Repair: A Meta-analysis                                       |
| 4             | Fleming           | Lilyana          | Colon Cancer: Risk factors, Detection, and Treatment  |
| 259           | Flora             | Alex             | Examining the Common Comorbidities in Pregnant Women with SUD Presenting to UK Health Systems in Kentucky   |
| 182           | Foltz             | Denise           | Patient Reported Outcomes of Gamma Knife Radiosurgery for Intracranial AVMs & Fistulas: A Retrospective Study   |
| 356           | Forsthoefel       | Emma             | "Methods to Assess Nutritional Status in a Dental Setting: A Literature Review"•  |
| 149           | Fox               | Grant            | Uncovering mRNA Modification-Dependent Dysregulation in Alzheimer's Disease: A Comparative Epitranscriptomic Analysis of Post-Mortem Human Brain Tissue |
| 95            | Frawley           | Andrew           | Assessment of Urine Culture Stewardship in Pediatrics at UK Healthcare After Adjusting Cutoff for Pyuria on Urinalysis                                  |
| 342           | Fulgham           | Laurel           | The Association of Psychological Stress on Nurse Practitioner Retention in Early Practice   |
| 343           | Gambill           | Rachel           | Characteristics of Women with Peripartum Cardiomyopathy: A Retrospective Analysis of Hospital Admissions in Mississippi                                 |
| 167           | Garrison          | Clayton          | Reverse Total Shoulder Arthroplasty with Humeral Head Autograft Surgical Technique for Severe Glenoid Bone Loss   |
| 24            | Gdovka            | Ava              | Analyzing the Effects of Social Determinants of Health on Dental Caries   |
| 385           | Ghazy             | Amr              | Implant site development using orthodontic tooth movement benefits and challenges.  |
| 208           | Gholamrezaeinejad | Niloufar/Fatemeh | Impacting Inflammation through Mechanistic Target of Rapamycin (imTOR)  |
| 66            | Ghoneim           | Elaf             | Biobanking for Breakthroughs: Advancing Neurologic Disease Research Through the NeuroBank   |
| 297           | Glass             | Autumn           | Cultural Factors and their impact on the Diagnosis of Disordered Eating in Rural Populations  |

# 20<sup>th</sup> Annual CCTS Spring Conference

Tuesday, April 1, 2025

Central Bank Center

## POSTER NUMBER INDEX

| Poster Number | Last Name       | First Name | Title   |
|---------------|-----------------|------------|---|
| 168           | Goetz           | James      | From Research to Rank Lists: Trends Beyond the Magic Number in Orthopaedic Surgery Residency Match                      |
| 299           | Gohrband        | Catherine  | Benefits of Using Adaptive Cycling for Adults with Lifelong Disabilities: A Systematic Review                           |
| 87            | Gomez-Giraldo   | Manuela    | Do changes in resting mechanotransduction current affect active actin remodeling at stereocilia tips in hair cells?     |
| 367           | Gonzales        | Himala     | Evaluating Outcomes and Barriers of Dental Care in Eastern Kentucky; Insights from the RMC Outreach Mobile Program      |
| 280           | Gonzalez        | Sara       | Adipogenic Commitment of Stem Cells and Fatty Degeneration in Skeletal Muscle after Knee Injury                         |
| 270           | Gonzalez Seguel | Felipe     | Skeletal muscle wasting in patients with critical illness requiring kidney replacement therapy: a prospective study     |
| 244           | Goodin          | Sophia     | Comparing Alcohol Use Questions in National Surveys Through Compiling an Alcohol Use Repository                         |
| 153           | Gordon          | Lacey      | Extracting HMW DNA for optical genome mapping with Bionano Saphyr reveals structural variants of disease related genes  |
| 381           | Gordon          | Sydney     | Bone-to-Implant Contact Difference between Bone-Level Implants and Tissue-Level Implants, a case series report          |
| 13            | Grace           | Ogunbayo   | Epidemiological Trends in Non-Hodgkin Lymphoma: Analyzing Incidence, Mortality, and Disparities in the U.S. (2017–2022) |
| 370           | Gupton          | Kali       | Effect of Isolation Techniques on Behavior: Rubber Dam vs Isolite   |
| 386           | Guthrie         | Scott      | Effect of Tongue Posture on Masticatory Musculature Activity — A Review of Electromyography Studies                     |
| 316           | Haddix          | Meaghan    | Improving Mental Health in Pediatric Hem/Onc Patients: Nursing Interventions and Holistic Care Strategies               |
| 245           | Hague           | Emma Frace | Exploring Changing Infant Health Outcomes in Kentucky   |

# 20<sup>th</sup> Annual CCTS Spring Conference

Tuesday, April 1, 2025

Central Bank Center

## POSTER NUMBER INDEX

| Poster Number | Last Name | First Name       | Title  |
|---------------|-----------|------------------|--|
| 194           | Haist     | Steven           | Development of a Primary Care Scholarly Concentration: Creating a Primary Care Health Inequities and Delivery Course     |
| 40            | Hall      | Evan             | Delayed Cardiotoxicity Following 5-FU: A Case of Reaction Years After Treatment  |
| 354           | Hall      | Faith            | Randomized Clinical Trial of a Brief Psychological Intervention for Chronic Orofacial Pain                               |
| 240           | Hamedi    | Fatemeh          | Intraoperative Optical Imaging of Tissue Hemodynamic Variations in Mastectomy Skin Flaps for Identifying Ischemic Tissue |
| 241           | Haque     | Chowdhury Azimul | Design and Development of a Wireless Wearable Fluorescence Imaging Device for Intraoperative Brain Tumor Identification  |
| 117           | Hargis    | Emma             | Health Disparities in Kentucky's Appalachian Counties: Interactions Between Physician Availability, Poverty, and Region  |
| 169           | Harris    | Landon           | A Novel Adduction-Related Mechanism of Shoulder Dislocation in Obese Patients with Shoulder Arthroplasty                 |
| 207           | Hart      | Samantha         | Immune Cell Function & Metabolism are Affected by Bariatric Surgery in a T2D-Dependent Manner                            |
| 146           | Hartig    | Colton           | CMV Mononucleosis Complicated by Viremia and Colitis in an Immunocompetent Patient                                       |
| 284           | Haste     | Kelsey           | Impact of Academics on Anxiety and Mental Health Needs of Undergraduate Students   |
| 72            | Hawkins   | Margaret         | Optimizing Glyoxal as an Alternative Tissue Fixative to PFA  |
| 170           | Hayes     | Daniel           | Quantitative Comparison of Femoral Head Exposure: Anterior Approach versus Trochanteric Flip Osteotomy                   |
| 285           | Head      | Elizabeth        | Looking at Accuracy and Speed Based on the Depth of an AAC Keyguard  |
| 131           | Hedinger  | Kyle             | The Effect of FASN Inhibition on mTOR Malonylation in a Colorectal Cancer Model  |
| 41            | Herndon   | Lexie            | Tissue Hypoxia and Multiple Organ Impairments in a Rat Model of Diabetes-Associated Amylin Dyshomeostasis                |

# 20<sup>th</sup> Annual CCTS Spring Conference

Tuesday, April 1, 2025

Central Bank Center

## POSTER NUMBER INDEX

| Poster Number | Last Name | First Name | Title  |
|---------------|-----------|------------|--|
| 25            | Hieneman  | Sydney     | Death: Personal Choice vs. Predestined Outcome   |
| 195           | Hill      | Rachel     | Interrater Reliability for Use of "Opportunistic" CT as a Bone Health Assessment in Chronic Pancreatitis (CP) Patients |
| 196           | Hill      | Rachel     | Evaluation of Pancreatic Fluid Enzyme Activity in the PROCEED Study  |
| 197           | Hill      | Rachel     | Serum Bone Biomarkers in Chronic Pancreatitis (CP): An Exploratory Pilot Study From the NAPS2 Cohort                   |
| 5             | Holt      | Niyah      | Analyzing Colorectal Cancer: Global & National Trends, Geographic Disparities, and Public Health Implications          |
| 145           | Horne     | Kayla      | STEAM Outreach through Data Sonification   |
| 260           | Houk      | Allison    | Influential Themes in Clinical Practice: Insights from 50 Years of UKPA Alumni   |
| 14            | House     | Davis      | The Impacts of Non-Hodgkin's Lymphoma on Diverse Demographics  |
| 178           | Howell    | Davis      | To Admit or Not to Admit: Age and Apnea Development in Pediatric RSV Patients  |
| 321           | Howski    | Ava        | Predictors that influence ventilator days in severe non-traumatic brain injured patients: A Pilot Study                |
| 60            | Hughes    | Jordan     | Short-Term ULLS and Sleep Restriction Reduce Voluntary Strength and Firing Rate of MUs During Isometric Knee Extension |
| 375           | Hunt      | Katie Jo   | Automated 3D Facial Index Using Machine Learning   |
| 305           | Hunton    | Ryan       | What makes a great differential? A mixed methods descriptive analysis  |
| 344           | IDDRISU   | MOHAMMED   | Impact of Social Determinants of Health on Cardiovascular Disease Risk among Latinos                                   |
| 210           | Ito       | Misa       | Rare Overlapping Immune-Related Neuromuscular Involvement and Myocarditis Induced by Nivolumab                         |
| 211           | Ito       | Misa       | A Challenging Case of Primary Adrenal Insufficiency Mistakenly Labeled as Pre-diabetes                                 |
| 113           | Iyer      | Krithika   | A Preclinical Model for Investigating Sepsis-induced Complications in Spinal Cord Injury                               |

# 20<sup>th</sup> Annual CCTS Spring Conference

Tuesday, April 1, 2025

Central Bank Center

## POSTER NUMBER INDEX

| Poster Number | Last Name | First Name | Title  |
|---------------|-----------|------------|--|
| 187           | Jackel    | Chris      | Transaxillary Impella 5.5 Implantation Without Fluoroscopy: A Novel Approach   |
| 361           | Jacobson  | Matthew    | Impact of 3D-Printed Model Designed for Apicoectomy Training on User's Knowledge, Confidence, and Interest               |
| 225           | Javidan   | Aida       | Obesity-Associated Inflammatory Responses are Significantly Modified by Insulin Sensitivity and Sex                      |
| 378           | Jennings  | Claudia    | A Review of Exercise as an Adjunctive Pain Management Strategy in Orthodontics: Optimizing Patient Comfort and Treatment |
| 73            | Jinawong  | Kewarin    | The Effects of FeTMPyP on Hippocampal Synaptic Function in 30-month-Old Mice   |
| 7             | Johnson   | Veda       | Descriptive Epidemiology of Leukemia   |
| 329           | Johnson   | Shannon    | The Impact of a Geriatric Trauma Unit  |
| 379           | Jones     | Lillian    | Clinical Recommendations for Using Zirconia as a Dental Implant Material   |
| 132           | Junkins   | Sadie      | Recurrence Detection of Stage IIB to IIID Cutaneous Melanoma: Is PET Superior to Other Imaging?                          |
| 46            | Kabir     | Ajran      | Quorum Sensing Inhibition: A Novel Strategy to Combat Non-Typhoidal Salmonella   |
| 363           | Kaple     | Logan      | Association of dental caries and socioeconomic status utilizing a composite index  |
| 47            | Karim     | Rokon Ul   | OleD Loki as a catalyst for Glycosylation of Heterocycles and Sterically-Constrained Acceptors                           |
| 200           | Karki     | Bikram     | Genome-Wide Analysis of Short Tandem Repeat Expansions in Alzheimer's Disease  |
| 27            | Karle     | Erika      | Translational Research in Action: Challenges and Solutions of Implementing an Innovative Diabetes Prevention Program     |
| 61            | Keeble    | Alex       | FOXO1-Driven Myonuclear Pathology in Chronic Kidney Disease Persists After Kidney Transplantation                        |
| 230           | Kelly     | Olivia     | Characteristic Histopathological Patterns in Diverse Cardiomyopathies: Insights from a 600-Patient Biobank               |

# 20<sup>th</sup> Annual CCTS Spring Conference

Tuesday, April 1, 2025

Central Bank Center

## POSTER NUMBER INDEX

| Poster Number | Last Name   | First Name | Title   |
|---------------|-------------|------------|---|
| 52            | Khan        | Areeba     | Implementing a Health Literacy Curriculum for Refugee and Immigrant Students in a Cincinnati Public High School         |
| 127           | Khashimov   | Mardan     | A Case and Literature Review of Fat Emboli Syndrome (FES) Following G-CSF for Hematological Malignancies.               |
| 293           | Kidney      | Anna       | The Asymmetry Factor: Can combined driving sport help mitigate age-related declines in strength?                        |
| 157           | Kilgore     | Madison    | Ictal SPECT vs. Postictal MRI for Seizure Onset Zone Localization   |
| 67            | Kimseng     | Rungruedee | Intravital Imaging Techniques for Cerebrovascular Research  |
| 290           | Kimura      | Sena       | Examining the Relationship between Strength, Flexibility, Endurance & Knee Biomechanics during a Sissonne among Dancers |
| 330           | Kingsley    | Spring     | Clarifying end-of-life care: A nursing education initiative   |
| 294           | Knight      | Mazie      | Precision Under Pressure: Jockey's Reaction Accuracy in Competition   |
| 144           | Kotiya      | Deepak     | Passive amylin immunotherapy improves brain function and reduces brain $\beta$ -amyloid pathology in APP/PS1 mice       |
| 261           | Kotten      | Gaby       | Impact of Transportation Barriers and Distance to Medical Facilities on Follow-Up Care in Rural Communities             |
| 171           | Kraus       | Kameron    | Secondary Displacement of Nonoperatively Managed Greater Tuberosity Fractures: Rates, Risk Factors, and Range of Motion |
| 26            | Kruse-Diehr | Aaron      | Individual and Community-level Barriers and Needs for Management of Chronic Disease in Rural Appalachian Kentucky       |
| 48            | Lamichhane  | Bibek      | Next-generation probiotics for Campylobacter control: A novel antibiotic-alternative approach                           |
| 232           | Laney       | Hannah     | Spatially Explicit Contraction Model Predicts That Filament Compliance Affects Time Course of Relaxation                |
| 93            | Latimer     | Abigail    | Symptom Burden Among Housing-Insecure Patients: A Comparative Study   |

# 20<sup>th</sup> Annual CCTS Spring Conference

Tuesday, April 1, 2025

Central Bank Center

## POSTER NUMBER INDEX

| Poster Number | Last Name      | First Name | Title   |
|---------------|----------------|------------|---|
| 142           | Lawless        | Rob        | Bibliometric Analysis of Human Leukocyte Antigen Associations with Dermatologic Conditions                              |
| 301           | Lee            | Kara       | What is Normal to Expect for Someone with Normal Pressure Hydrocephaly?   |
| 18            | Lehmann        | Piper      | Unmasking Kidney Cancer: Awareness, Prevention, and Treatment   |
| 174           | Leon           | Jacqueline | Elevating Survivorship: Quality Improvement for Head and Neck Cancer Patients at Markey Cancer Center                   |
| 220           | Li             | Ailing     | Overexpression of SAA in the liver promotes atherosclerosis in apolipoprotein E-deficient mice lacking SAA              |
| 365           | Li             | Sophia     | Self-Reported Opioid Use and Disposal Among Adolescents and Young Adults After Tooth Extraction                         |
| 102           | Lin            | Cindy      | Comparing Robotic and Video-Assisted Techniques for Minimally Invasive Lobectomy: A Single-Center Experience            |
| 331           | Lister         | Siobhan    | Utilization of Organ Inventories in the Primary Care Setting: Identifying Barriers and Increasing Usage                 |
| 34            | Liu            | Jinpeng    | Spatial Transcriptomic Characterization of Pediatric Brain Tumors in Kentucky   |
| 192           | Liu            | Yinxing    | Case Study: Identifying low-level DSAs in a pre-transplant kidney/pancreas patient.                                     |
| 42            | Lohano         | Sarisha    | RAD Deletion Increases Exercise Through Mitochondrial Function  |
| 35            | Macias Palacio | Sara       | Extracellular Vesicles Derived from Glioblastoma After Radiation Promote Microglia-Mediated Neurotoxicity               |
| 68            | Maisel         | Tyler      | WMH Growth/Regression: A Sensitive Neuroimaging Biomarker for CAA   |
| 83            | Major          | Edward     | No Difference in Early Range of Motion: Robotic Assisted versus Conventional Instrumentation in Total Knee Arthroplasty |
| 101           | Major          | Elaine     | Revolutionizing PAH Treatment: A Groundbreaking Protocol for Sotatercept Initiation                                     |



# 20<sup>th</sup> Annual CCTS Spring Conference

Tuesday, April 1, 2025

Central Bank Center

## POSTER NUMBER INDEX

| Poster Number | Last Name   | First Name | Title  |
|---------------|-------------|------------|--|
| 175           | Marcelletti | Anthony    | Reporting of Sociodemographic Data in Vestibular Schwannoma: A Systematic Review   |
| 188           | Marker      | Nicole     | Surgical Treatment of Cardiac Tumors: A Single Center Experience   |
| 224           | Marksbury   | Ashlee     | Restoration of the Sympathoadrenal response to Hypoglycemia in Rodents Following Periods of Hypoglycemia Avoidance       |
| 332           | Marler      | Ryan       | Evaluating the Impact of Stress First Aid Programs in a Primary Care Setting   |
| 108           | McDaniel    | James      | Mortality Rate of 30-Day Inpatient Tracheostomy Hemorrhage and Contributing Factors                                      |
| 176           | McGrath     | Monica     | AppSTAR Implementation Insights from the 2023-2024 School Year   |
| 212           | McMurtry    | Shyla      | From Acute Coronary Syndromes and Cardiomyopathy to Fatal Arrhythmias: Re-challenging 5-Fluoropyrimidine Cardiotoxicity  |
| 254           | McWhorter   | Ketrell    | Impact of Tobacco Use on Sleep Patterns in a Cohort of Appalachian Young Adults Using Wearable Technology: A Pilot Study |
| 213           | Meade       | Nicholas   | Diagnosis, Treatment and Outcome of Histoplasma Meningitis: A Case Series from 2015 to 2022 in A Tertiary Care Center    |
| 154           | Medina      | Elbuth     | Exploring the Effects of Mixed Reality as a Cognitive Rehabilitation Aid in Stroke                                       |
| 80            | Memetimin   | Hasiyet    | Mirabegron Treatment Reduces Myofibroblasts and CXCR2 Expression in Adipose Tissue in Obesity                            |
| 246           | Meyers      | Carly      | Evaluation of an Artificial Intelligence Support Tool in a Psychiatric Residential Treatment Facility                    |
| 202           | Milburn     | Gregory    | Mechanical Unloading Increases Phosphorylation of Sarcomeric Proteins and N2B Titin in Patients with Heart Failure       |
| 348           | Miller      | Megan      | Empowering Women's Health: Transforming Prenatal Care Through Clinical Judgement and Trauma-Informed Practices           |
| 9             | Miner       | Lucy       | Epidemiology of Leukemia   |

# 20<sup>th</sup> Annual CCTS Spring Conference

Tuesday, April 1, 2025

Central Bank Center

## POSTER NUMBER INDEX

| Poster Number | Last Name | First Name | Title  |
|---------------|-----------|------------|--|
| 199           | Minton    | Austin     | Multi-Omic and Biochemical Profiling of Heart Failure Specimens at the University of Kentucky                            |
| 253           | Miracle   | Dustin     | Kentucky's Contraceptive Deserts: Geographic Variations in Contraceptive Care Measures among Medicaid Enrollees          |
| 350           | Mishra    | Pratishtha | Impact of Sleep on Oral Microbiome   |
| 255           | Moffitt   | Trevor     | Budgetary Choices by People With Living Experience for Harm Reduction Vending Machine Implementation                     |
| 288           | Moffitt   | Annie      | Building the Appalachian Speech-in-Noise-Test  |
| 94            | Mofidi    | Sahar      | Purification and Molecular Networking for Dereplication of Cyanobacterial Compounds with Sigma-2 Affinity                |
| 377           | Moncrief  | Kathryn    | A Qualitative Analysis of Oral Hygiene and Patient/Provider Interactions   |
| 159           | Moorman   | Kelsey     | Evaluating Early Intravenous Nutrition and Outcomes in Neonates Undergoing Therapeutic Hypothermia Protocol              |
| 221           | Mumbi     | Florence   | Infiltrative Cardiomyopathies Display Decreased Phosphorylation of Thick and Thin Filament Regulatory Proteins           |
| 179           | Murphy    | Maggie     | Environmental Contributions to Cardiovascular Risk in Children with Elevated Blood Pressure: Preliminary Findings        |
| 317           | Music     | Emma       | How Effective are HPV Vaccination Interventions Among Young Adults (18-26 years)   |
| 147           | Myint     | Thein      | Efficacy of Joint Fluid Cultures in BD Bactec® Bottles Compared to Routine Culture Media: A Quality Assurance Validation |
| 136           | Naidu     | Shrishti   | Temporal Dynamics of Cardiovascular, and Thermoregulatory Homeostasis in Male and Female Mice                            |
| 286           | Neglia    | Katherine  | The Effect of Bacterial Endotoxins and Serotonin on Gastrointestinal Contractions  |
| 274           | Neikirk   | Jenna      | Examining Interventions Provided by OT/PT/SLP in Disorders of Consciousness: A Scoping Review                            |
| 74            | Nelson    | Tess       | The monoclonal antibody, 17E1, selectively labels glial fibrillary acid protein in 5xFAD mice                            |

# 20<sup>th</sup> Annual CCTS Spring Conference

Tuesday, April 1, 2025

Central Bank Center

## POSTER NUMBER INDEX

| Poster Number | Last Name   | First Name  | Title  |
|---------------|-------------|-------------|--|
| 97            | Nichols     | Brayden     | Exploring Positive Distractions in Pediatric Healthcare Design   |
| 318           | Norrenbrock | Kendall     | Early Skin-to-Skin Care: Impact on Exclusive Breastfeeding in Hispanic Women   |
| 3             | Northrip    | Niven       | Pathology of Breast Cancer: Incidence and Mortality by Age and Gender  |
| 118           | Norton      | Noah        | Mapping Microglial Heterogeneity in the Context of Alzheimer's Neuropathology  |
| 271           | Nowell      | Kallie      | The Relationship Between Self-Reported Motivation and Physical Activity Level Among Young Adults: A Secondary Analysis |
| 109           | Obert       | Chloe       | Underfunded but Unstoppable: The Paradox of Female Success in Plastic Surgery Research                                 |
| 103           | Ohler       | Tyler       | The Future is Ferumoxytol: A Case Based Report on its Use in Women's Vascular Imaging                                  |
| 275           | Ohrnberger  | Elisabeth   | Saddled with Pain: Equestrian Athletes Stay Active Despite Chronic Pain  |
| 58            | Oliver      | Emily       | Evaluating Infectious Disease Specialist Involvement on Gram Negative Bacteremia Outcomes                              |
| 1             | Orr         | Olivia      | Descriptive Epidemiology of Bladder Cancer   |
| 22            | Otto        | Elizabeth   | Descriptive Epidemiology of Thyroid Cancer   |
| 300           | Owen        | Allison     | Altered Collagen 1 Dynamics during Post-sepsis Skeletal Muscle Dysfunction   |
| 345           | Owens       | Sarah       | Noninvasive Measurements of Dehydration in Healthcare Workers: A Systematic Review                                     |
| 302           | Pabian      | Patrick     | Examining influence of clinical setting type on first clinical performance through use of standardized methodology     |
| 369           | Parrish     | Tyler       | Understanding and Implementation of Vital Pulp Therapy: A Nationwide Survey  |
| 75            | Passidomo   | Mariena     | Relationships Between Blood and CSF Biomarkers in Alzheimer's Disease Risk   |
| 62            | Patel       | Jaydeepbhai | Evaluating Mitochondrial Bioenergetics of Skeletal Muscle in Sepsis Survivors following Spinal Cord Injury             |
| 189           | Patel       | Ronak       | Endovascular Treatment of Iatrogenic Acute Budd-Chiari Syndrome Secondary to Malpositioned Hemodialysis Catheter       |

# 20<sup>th</sup> Annual CCTS Spring Conference

Tuesday, April 1, 2025

Central Bank Center

## POSTER NUMBER INDEX

| Poster Number | Last Name         | First Name | Title   |
|---------------|-------------------|------------|---|
| 239           | Patel             | Jay        | Building Block-Based 3D Hydrogel Scaffolds with Multi-Scale Porosity for Tissue Regeneration                              |
| 262           | Patel             | Khayla     | Determining Social Factors that Correlate with Emergency Department Bounce Backs at UK Chandler Hospital                  |
| 295           | Patel             | Neyati     | Hold Your Horses: Evaluating Visuomotor Reaction Times in Combined Drivers  |
| 352           | Patel             | Viddhi     | Standardizing a Brief Psychological Physical Self-Regulation Intervention for Chronic Masticatory Muscle Pain Disorders   |
| 357           | Patel             | Ami        | Oral Function Assessment Tools and Their Impact on Nutrition in Dentistry   |
| 358           | Patel             | Nidhi      | Protocol Paper for an Efficacy Trial of Brief Behavioral Interventions for Chronic Orofacial Pain                         |
| 362           | Patino            | Brianna    | The 2023 Kentucky Early Learners Oral Health Survey of Caries Among Children Ages 2-5                                     |
| 69            | Prince            | Christiaan | Metabolic-Associated Protein Differences in Total and Astrocyte Enriched Extracellular Vesicles During Stroke             |
| 263           | Quinlan           | Ashley     | Impacts of Gender-Affirming Care on the Mental Health of Transgender and Gender-Nonconforming College Students            |
| 238           | Rabienia Haratbar | Samaneh    | Noncontact diffuse optical imaging of blood flow and oxygenation distributions in reconstructive skin flaps of rats       |
| 387           | Ragland           | Nicholas   | Auto Transplantation of a Mandibular 2nd Premolar in a Patient with Hypodontia: A Case Report                             |
| 148           | Ramirez           | Joshua     | Exploring the Effects of pH on Antimicrobial Susceptibility to Treat Urinary Tract Infections                             |
| 172           | Ramirez           | Joshua     | The Peritellar Joint Congruence in Pediatric Flexible Flatfoot Deformity and Normal Controls: A 3D Weightbearing CT Study |
| 133           | Ray               | Robin      | Tobacco Use, Secondhand Smoke Exposure and Infant Feeding Practices Among Rural Kentucky Mothers                          |

# 20<sup>th</sup> Annual CCTS Spring Conference

Tuesday, April 1, 2025

Central Bank Center

## POSTER NUMBER INDEX

| Poster Number | Last Name | First Name | Title  |
|---------------|-----------|------------|--|
| 36            | Regnier   | Sean       | Kentucky Women with Disabilities and Cancer Screening: Differences in Knowledge, Beliefs & Feelings.                 |
| 88            | Rehal     | Omnia      | The Impact of Cochlear Implantation on Physical Activity and Quality of Life   |
| 89            | Rendon    | Luis       | How Does D-Tubocurarine Blocker Affect the Mechano-Electrical Transducer Channel of the Inner Hair Cells?            |
| 277           | Renkert   | Elisabeth  | Evaluating Stress Responses During Phone Calls Compared to Other Speaking Tasks                                      |
| 281           | Renner    | Kelley     | Psychological Impacts in Exercise Riders and Professional Jockeys Following Injury                                   |
| 19            | Rhodus    | Haley      | Epidemiology of Renal Cancer of the Kidneys on Populations   |
| 17            | Ricks     | Addison    | Prevalence and Mortality of Renal Cancer in Different Geographical Demographics: A Meta-Analysis                     |
| 359           | Rios      | Angelica   | Palatal Wound Healing Comparison Between Diabetics and Non-Diabetics Patients  |
| 296           | Ritchie   | Maddie     | Recommendations from an ECHO in Augmentative and Alternative Communication (AAC): An Implementation-based Analysis   |
| 137           | Robbe     | Rachel     | Thrombotic Mechanisms in People Living with HIV at Initial Diagnosis   |
| 264           | Roszman   | Bailey     | Artificial Intelligence in Healthcare: Utilization and Barriers  |
| 76            | Roth      | Sophia     | The Effects of FeTMPyP on Neurovascular Function in Aged Mice  |
| 203           | Roth      | Chloe      | Phosphorylation of Cardiac Myosin Binding Protein-C Does Not Predict Right Ventricle Heart Failure in HFrEF Patients |
| 319           | Runion    | Trenton    | Empowering Communities: HIV Prevention Through Harm Reduction Strategies   |
| 120           | Ryan      | Colin      | Autoimmune Encephalitis Mimicking UTI Delirium in an Elderly Patient   |
| 21            | Sadler    | Brooklynn  | Assessing and Evaluating the Epidemiology of Thyroid Carcinoma   |
| 236           | Safavi    | Pegah      | Continuous Monitoring of Cerebral Blood Flow and Oxygenation Responses to Intermittent Hypoxia in Neonatal Rats      |
| 226           | Sah       | Susma      | Sarcomere-level Contractility in Heart Failure   |

# 20<sup>th</sup> Annual CCTS Spring Conference

Tuesday, April 1, 2025

Central Bank Center

## POSTER NUMBER INDEX

| Poster Number | Last Name         | First Name | Title  |
|---------------|-------------------|------------|--|
| 360           | Saltz             | Alyssa     | Factors Influencing Opioid Prescription in a Dental Academic Setting: A Qualitative Analysis                             |
| 380           | Sami              | Mina       | Using CBCT to Determine Appropriate Depth of Implant for Ideal Emergence Profile   |
| 291           | Sanjeevan         | Harry      | Co-Designing a Smartphone-Based Navigation System for Cancer Patients in Bowling Green, KY                               |
| 98            | Schadler          | Aric       | Patterns in Medicaid Claims for Preterm Births in the State of Kentucky: 2017-2021                                       |
| 99            | Schadler          | Aric       | Investigation of Prenatal Maternal Diagnosis Codes in Relation to Poor Birth Outcomes In Kentucky Using Medicaid Claims  |
| 110           | Scharff           | Louise     | Primary Treatment of Pediatric Cricopharyngeal Achalasia with Botulinum Toxin Injection: Case Report & Literature Review |
| 247           | Schmitt           | Isabel     | Identifying Barriers and Best Practices in Addressing Unmet Social Needs Influencing Health Outcomes                     |
| 233           | Schoeder          | Lily       | Epinephrine Increases the Occurrence of Arrhythmia Under Low-Glucose Conditions in Isolated Rat Hearts                   |
| 333           | Schuler           | Michelle   | Evaluating the Outcomes of an Educational Intervention for Providers and Two Week Home Blood Pressure Monitoring         |
| 282           | Sesay             | Nadia      | How a DASH Diet Integrative Review Shapes a Socio-Ecological Approach to Hypertension Control for African Americans      |
| 283           | Shahad Bawa       | Mansura    | Can Men and Women Receiving Federal Food Assistance Afford to Follow the Dietary Approaches to Stop Hypertension?        |
| 143           | Shamaei Zadeh     | Parisa     | Community-Based Sunscreen Dispensers at Chandler Hospital: Findings and Review   |
| 223           | Shankara Bhaktula | Srushan    | Disparities in physical rehabilitation: A comparative study of Hispanic vs non-Hispanic adults with critical COVID-19    |
| 249           | Shin              | Hyeun      | The impact of caregiver's needs for re-entry among children in out-of-home care  |
| 180           | Shoemaker         | Robin      | Sex Differences in Associations among Cardiometabolic Risk Factors and Serum Steroids in Adolescents with Obesity        |

# 20<sup>th</sup> Annual CCTS Spring Conference

Tuesday, April 1, 2025

Central Bank Center

## POSTER NUMBER INDEX

| Poster Number | Last Name   | First Name | Title  |
|---------------|-------------|------------|--|
| 209           | Skaff       | Brianna    | Gender and Racial Differences in Follow-Up Testing and Outcomes in Patients with no Known Coronary Artery Disease        |
| 278           | Sklivas     | Alexander  | Differences in Gene Expression Profiles Between Male and Female Skeletal Muscle in Response to Mechanical Load           |
| 177           | Smith       | Evan       | The Impact of Hearing Aids on Cognitive Health in Hearing-Impaired Adults: A Scoping Review                              |
| 320           | Smith       | Bryce      | A Nursing Student Guide on Intravenous Smart Pump Use to Reduce Medication Errors  |
| 105           | Smith       | Adrienne   | Opioid Overdose Harm Reduction among Black Adults: An Adapted Intervention   |
| 90            | Smock       | Annie      | The Role of Hormone Replacement Therapy on Auditory Function in Post-menopausal Women: Systematic Review & Meta-analysis |
| 138           | Solis       | Ricky      | Computerized Decision Support for Stroke Prevention in High-Risk Atrial Fibrillation Patients in a Community Setting     |
| 173           | Southall    | Wyatt      | Outcomes Following Distal Femur Replacement for Fracture: A Multi-Institutional Retrospective Review                     |
| 216           | Squarci     | Caterina   | Modeling Intra- and Intermolecular Cooperativity Between Myosin Heads Using Spatially-Explicit Simulations.              |
| 8             | Squire      | Julianna   | From Data to Action: Understanding Leukemia Trends and Prevalence  |
| 100           | Stacy       | Audra      | Effects of Probiotic Usage on Finnegan Scoring and Length of Treatment for Neonatal Opioid Withdrawal Syndrome           |
| 106           | Stafford    | Maribeth   | Acute Cannabis and Alcohol Effects on Simulated Driving Performance and Subjective Driving Confidence in Humans          |
| 289           | Stevens     | Olivia     | Assessing Clear Speech Implementation in Real-World Contexts   |
| 336           | Stigall     | Sarah      | Implementation of a Post-Code Debrief Tool led by the Chaplain and the Unit Lead Nurse in the Medical ICU                |
| 139           | Sturgill    | Aidan      | Calcium Channel Blockers Versus Adenosine for Treatment of SVT in an Emergency Setting                                   |
| 53            | Subramaniam | Vaaragie   | Undetectable Bicarbonate in a Well-Appearing Patient   |

# 20<sup>th</sup> Annual CCTS Spring Conference

Tuesday, April 1, 2025

Central Bank Center

## POSTER NUMBER INDEX

| Poster Number | Last Name     | First Name | Title  |
|---------------|---------------|------------|--|
| 54            | Subramaniam   | Vaaragie   | A Case of Neurocysticercosis in Emergency Department   |
| 28            | Sullivan      | Alisia     | Coping with Race-Related Stress: A Scoping Review of Strategies Used by Black Youth                                      |
| 222           | Summers       | Louisa     | Six Month Physical Activity Levels in Survivors of Critical Illness  |
| 190           | Suri          | Reecha     | Transcatheter closure of patent foramen ovale- a single center experience.   |
| 59            | Surratt       | Hilary     | Piloting a Novel Community-Engaged Surveillance System to Improve Harm Reduction Services for People Who Inject Drugs    |
| 250           | Taylor        | Mason      | Resource Guides: Connecting Kentucky's Communities   |
| 346           | Thapa         | Ashmita    | Quality of Life Disparities Among Black Patients with Heart Failure: The Role of Depressive Smtoms and Functional Status |
| 29            | Thomas        | Matt       | Time-restricted Eating Advances Meal Timing in Postmenopausal Women  |
| 205           | Thompson      | Andrea     | Edaravone Protects the Hippocampus from Brain Damage Following Insulin-Induced Severe Hypoglycemia                       |
| 366           | Thompson      | Gabrielle  | Integration of Diabetes and Oral Care in Kentucky  |
| 63            | Thompson      | Heather    | Porcine ACL Transection Injury Induces Clinically-Relevant Deficits in Quadriceps Quality and Fiber Size                 |
| 334           | Thompson      | Kimberly   | Enhancing Patient and Family Centered Care: Transforming the NICU Experience Through Compassionate Support and Teamwork. |
| 31            | Thorpe        | Shemeka    | Designing and Implementing a Black Feminist Health Equity Project: A Focus on Reproductive Justice                       |
| 265           | Thurman       | Sydney     | A Contemporary Review of Nutrition Decision-Making Factors to Inform Development of an mHealth Solution                  |
| 335           | Tillett       | Keelie     | Improving the Diabetic Foot Screening Process and Foot Care Patient Education in a Primary Care Setting                  |
| 384           | Tippadampally | Srikavya   | The impact of substance use disorder on oral health — A comprehensive narrative review                                   |



# 20<sup>th</sup> Annual CCTS Spring Conference

Tuesday, April 1, 2025

Central Bank Center

## POSTER NUMBER INDEX

| Poster Number | Last Name        | First Name    | Title  |
|---------------|------------------|---------------|--|
| 214           | Torres Yee       | Jennifer      | Immune checkpoint inhibitor-induced myocarditis and overlap syndrome in the Bluegrass Region: Case Series.               |
| 43            | Tran             | Alex          | Stent Grafts for Symptomatic Thoracic Central Venous Occlusions in Patients with Arteriovenous Access                    |
| 337           | Traugott         | Adam          | What We Say Matters: Reducing Drug Use Stigmatization by Healthcare Professionals Through Narrative Based Education      |
| 81            | Turner           | Meghan        | Adipocyte-Specific Mineralocorticoid Receptor Deletion Improves Glucose Intolerance only in obese male mice              |
| 251           | Valenzuela-Silva | Melina        | Comparative Analysis of Obesity Prevalence Among U.S. Latinos by Health Insurance Status                                 |
| 304           | Vanderford       | Cheryl        | Utilization of Social Media as a Pedagogical Tool to Enhance Physician Assistant Student Learning of Psychiatry          |
| 374           | Viana Miguel     | Manuela Maria | Insulin-Loaded Silk Fibroin/Chitosan Film for Oral Mucosa Healing - A New Drug Delivery System.                          |
| 364           | Vickery          | Ben           | Kentucky Dental Workforce Characteristics and Impact on Vulnerable Populations   |
| 37            | Vieth            | John          | Factors Associated with Non-Compliance Rates in Human Papillomavirus Otolaryngology Population.                          |
| 44            | Voeking          | Oliver        | Exogenous estradiol does not regulate daily metabolic rhythms underlying diet-induced obesity in male mice               |
| 228           | Voisard          | Layne         | 7-BIA: A Small Molecule PTPRD Antagonist for Treatment of Metabolic Syndrome   |
| 322           | Voorhees         | Savannah      | Promoting Belonging and Well-Being to Mitigate Burnout in Healthcare Students: A Blue Zone Approach                      |
| 77            | Walker           | Mayah         | Predicting Hemorrhagic Transformation Following Mechanical Thrombectomy with Extracellular Vesicle-Associated Proteins   |
| 272           | Walsh            | Bridget       | Comparing Patient-Reported Outcomes in Individuals with Chronic Ankle Instability Based on Mental Health Condition Diagn |
| 20            | Walter           | Tyler         | Descriptive Epidemiology of Thyroid Cancer   |

# 20<sup>th</sup> Annual CCTS Spring Conference

Tuesday, April 1, 2025

Central Bank Center

## POSTER NUMBER INDEX

| Poster Number | Last Name          | First Name | Title  |
|---------------|--------------------|------------|--|
| 116           | Ward               | Tyler      | Annotation-Efficient Task Guidance for Medical Segment Anything  |
| 134           | Wasef              | Mary       | Clearance of Photoproducts through cAMP Induction Following UV Exposure  |
| 124           | Wayer              | Caroline   | Exploring the Effects of Mixed Reality Game Training on Balance and Motor Function in Stroke Patients                    |
| 30            | Webster            | Marguerite | Predictors of Post-Incarceration Primary Care Utilization Among Women with Opioid Use Disorder                           |
| 201           | Wellette-Hunsucker | Austin     | Impacts of Post-Translational Modifications of Sarcomeric Proteins in Various Heart Failure Etiologies                   |
| 183           | Whitfield          | Olivia     | Enhancing Efficiency in a High-Volume Radiology Clinic: Modern Modeling Approach to Scheduling and Resource Optimization |
| 107           | Wilhoit            | Brian      | How Physicians Across Different Specialties Determine the Risk of Opioid Misuse Upon Prescription                        |
| 229           | Wilkerson          | Elizabeth  | Investigating Isometric Force Production of Cardiac Tissue Through Multicellular Muscle Mechanics                        |
| 125           | Willhoite          | Carolene   | Investigating The Feasibility of Virtual Reality Singing Program in Individuals With Mild Cognitive Impairment           |
| 6             | Williams           | Williams   | The Descriptive Epidemiology of Colorectal Cancer  |
| 266           | Williams           | Chloe      | Comparing the Incidence of Pediatric Neuroblastoma in Rural vs. Non-Rural Kentucky: A Statistical Analysis               |
| 307           | Witt               | Heather    | Comparing Student Self-Identified Rural Identity with Federal Definitions of Rurality                                    |
| 279           | Wohlgemuth         | Ross       | Targeting the Extracellular Matrix to Support Aged Muscle Hypertrophy  |
| 126           | Wolff              | Nancy      | Communication Impairment in Adults with Dementia Associated with Sensory Processing Abnormalities and Caregiver Burden   |
| 306           | Woltenberg         | Leslie     | Social Capital and Academic Achievement within Undergraduate Learning Communities: A Network Analysis                    |

# 20<sup>th</sup> Annual CCTS Spring Conference

Tuesday, April 1, 2025

Central Bank Center

## POSTER NUMBER INDEX

| Poster Number | Last Name | First Name | Title  |
|---------------|-----------|------------|--|
| 347           | Wuni      | Abubakari  | Impact of social support on the quality of life of patients diagnosed with prostate cancer: A Systematic Review        |
| 267           | Wycoff    | Kaitlyn    | Comparison of Blood Pressure Measurements within an ALS Clinic   |
| 308           | Xia       | Yuyan      | Physician Assistant Student Attitudes Toward the Utilization of AI to Enhance Psychiatry Skill Development             |
| 373           | Yacoub    | Monica     | Comparison between two types of Restorative Protocols associated with CTG in Treating a Single Combined Defect.        |
| 111           | Yadav     | Anika      | Diagnosis of Urothelial Carcinoma of the Primary Kidney Allograft Using a Fluorescence-Tagged Red Blood Cell Scan      |
| 112           | Yadav     | Anika      | Hemiarthroplasty of Distal Humeral Fractures Using Latitude Implant: A Case Series                                     |
| 338           | Yeager    | Leah       | Managing Cancer Related Fatigue: Can Yoga Help?  |
| 273           | Yeatts    | Jennifer   | The Influence of Speaking Rate on Reaction Time: Uncovering Cognitive Load in Speech Modification                      |
| 84            | Young     | Brandon    | Helping Guide the Surgical Decision: A Review of Diagnostic Measurements to Assess Recurrent Patellar Instability Risk |
| 276           | Young     | Hannah     | Gender Differences in Lower Limb Prosthetic Prescription Rates: a systematic review                                    |
| 191           | Zalla     | Rachel     | Interdisciplinary Communication Tools in a Division of Surgery   |
| 119           | Zeltner   | Matthew    | Influence of Discharge Prescription Supply on All-cause Readmission Rates  |
| 85            | Zhang     | Yunqian    | Microgel-Based Macrophage Metabolic Reprogramming for Immune Modulation and Tissue Regeneration                        |
| 198           | Zhu       | Qingzhang  | PAQR4 impacts liver metabolic remodeling by mediating ceramide levels and hepatokine signaling                         |

## Frederick Douglass High School

### Presentation 1

Abstract Title: **Descriptive Epidemiology of Bladder Cancer**

Author(s): O. Orr, High School Student, Frederick Douglass High School; M. Rayan, High School Student, Frederick Douglass High School; M. Marin Mackliff, High School Student, Frederick Douglass High School.

**Abstract:** Cancer is a leading cause of death in the 21st century. Bladder cancer makes up roughly 5% of all new cancer cases each year and it is the 10th leading cause of cancer death in the United States. The purpose of this research is to analyze the prevalence of bladder cancer by understanding its geographic statistics and its impact on different populations. This was done by analyzing peer reviewed data from 2018 to 2022. Findings indicate that males have a higher percent of getting bladder cancer change than females do. Findings also indicate that the countries with the highest incidence rates are Asia and Europe.

Supported by: Frederick Douglass High School Biomedical Sciences (BMS) Pathway

Primary Presenter / email: **Orr, Olivia** / olivia.orr@stu.fayette.kyschools.us  
**High School Student**

## Frederick Douglass High School

### Presentation 2

Abstract Title: **Analysis of Bladder Cancer in the United States: Investigating the Impact of Gender, Age, and Geography.**

Author(s): L. R. Barrow, High School Student, Frederick Douglass High School; S. L. Rose, High School Student, Frederick Douglass High School; O. Kincaid, High School Student, Frederick Douglass High School

**Abstract:** In the United States, cancer remains a leading cause of mortality. This study aims to analyze and compare the incidence and mortality rates of bladder cancer by age and gender using peer-reviewed data from 2016 to 2021. During this time 376,679 cases were reported nationwide, with the highest concentration in the Northeast. While the precise cause of this is unknown, it is likely influenced by higher exposure to pollutants due to the increase in manufacturing and factory jobs in the region. Given that smoking is a major risk factor for bladder cancer, exposure to occupational and environmental carcinogens may contribute to higher incidence rates. Furthermore, men face a significantly higher risk of developing bladder cancer compared to women. One potential explanation is the higher prevalence of smoking among men, along with their increased likelihood of working in occupations with greater exposure to carcinogenic substances. Additionally, the incidence of bladder cancer rises with age, likely due to the increased effect of genetic mutations and DNA damage over time. In conclusion, bladder cancer incidence is influenced by multiple factors, including gender, geographic region, and age.

Supported by: Frederick Douglass High School Biomedical Sciences (BMS) Pathway

Primary Presenter / email: **Barrow, Lainey** / [lainey.barrow@stu.fayette.ky.schools.us](mailto:lainey.barrow@stu.fayette.ky.schools.us)  
**High School Student**

**Presentation 3**

---

Abstract Title: **Pathology of Breast Cancer: Incidence and Mortality by Age and Gender**

---

Author(s): N.K.Northrip, High School Student, Frederick Douglass High School; B. Short, Frederick Douglass High School; M. Slaughter, Frederick Douglass High School

---

**Abstract:** Breast cancer is a leading cause of cancer-related mortality, influenced by age, gender, and geographic location. Through analyzing peer reviewed data, this presentation explores its pathology, diagnosis, risk factors, and epidemiological trends, with a focus on Kentucky and global patterns. Most breast cancers originate in the ducts or lobules, with ductal carcinoma in situ (DCIS) making up 20-25% of cases. If untreated, DCIS can progress to invasive ductal carcinoma, the most common type (80% of cases). Screening typically begins at age 40 with mammography, followed by ultrasound, MRI, or biopsy if abnormalities are detected. Staging depends on the spread of cancer, including lymph node involvement. Incidence and mortality increase significantly with age. In Kentucky, central and eastern regions report the highest incidence and mortality, with factors like healthcare access influencing outcomes. Nationally, mortality rates have declined due to improved screening and treatment. Although 99.3% of cases occur in women, men can develop breast cancer, often with worse prognosis due to lack of awareness. Known risk factors include genetic mutations (BRCA1/BRCA2), hormone exposure, and lifestyle factors like alcohol consumption. While mortality rates have declined, disparities persist. Continued research, education, and early detection strategies are critical to reducing breast cancer's impact.

---

Supported by: Frederick Douglass High School Biomedical Sciences (BMS) Pathway

---

Primary Presenter / email: **Northrip, Niven** / niven.northrip@stu.fayette.kyschools.us  
**High School Student**

---

---

**Presentation 4**

Abstract Title: **Colon Cancer: Risk factors, Detection, and Treatment**

Author(s): Lilyana Fleming, High School Student, Frederick Douglass High School; Alexiah Fields, High School Student, Frederick Douglass High School; Adalyn Wilhoite, High School Student, Frederick Douglass High School

**Abstract:** Cancer remains one of the leading causes of death worldwide, with colorectal cancer (CRC) being one of the most prevalent forms. The purpose of this research is to explore the risk factors, early detection methods, and treatment advancements for colon cancer, focusing on improving survival rates. This study was conducted by analyzing peer-reviewed data from population-based studies and cancer registries from 2016 to 2022. Findings indicate that lifestyle factors such as diet, physical inactivity, and smoking significantly contribute to the development of colon cancer. Genetic mutations and family history also play a critical role in individual risk. Early detection methods, including colonoscopy and fecal tests, have proven to reduce mortality rates by identifying precancerous lesions before they become malignant. Treatment approaches, including surgery, chemotherapy, and immunotherapy, have advanced significantly, although survival rates vary depending on the stage at diagnosis. In regions like the United States, colon cancer screenings are recommended starting at age 45, with a focus on high-risk individuals. Continued research and public health efforts are essential in addressing the increasing incidence of colon cancer globally, with an emphasis on prevention, early detection, and personalized treatment strategies. The findings of this research offer valuable insights into improving strategies for the fight against colon cancer, contributing to better clinical outcomes and quality of life for patients.

Supported by: Frederick Douglass High School Biomedical Sciences (BMS) Pathway

Primary Presenter / email: **Fleming, Lilyana** / [lilyana.fleming@stu.fayette.kyschools.us](mailto:lilyana.fleming@stu.fayette.kyschools.us)  
**High School Student**

## Frederick Douglass High School

### Presentation 5

Abstract Title: **Analyzing Colorectal Cancer: Global & National Trends, Geographic Disparities, and Public Health Implications**

Author(s): N. R. Holt, High School Student, Frederick Douglass High School; L. B. Toponak, High School Student, Frederick Douglass High School; M. A. Ensminger, High School Student, Frederick Douglass High School

**Abstract:** Colorectal cancer (CRC) remains a significant public health concern in the United States, with incidence and mortality rates varying by region. This study aims to analyze the incidence rates of CRC across Kentucky, identifying regions with the highest burden and assessing potential contributing factors. Utilizing data from the Kentucky Cancer Registry and the Centers for Disease Control and Prevention (CDC), we examined CRC incidence rates by county and conducted statistical analysis to determine regional disparities. Our findings reveal that eastern Kentucky has the highest incidence rates in the state, with Wolfe County reporting the most cases per capita. Additionally, CRC is among the leading causes of cancer-related deaths in Kentucky, emphasizing the urgent need for enhanced screening, awareness, and healthcare access in high-risk areas. These findings show the necessity of targeted public health initiatives, including improved access to screenings, lifestyle interventions, and healthcare resources, particularly in eastern Kentucky. Addressing these disparities is critical to reducing the overall burden of CRC and improving health outcomes across the state.

Supported by: Frederick Douglass High School Biomedical Sciences (BMS) Pathway

Primary Presenter / email: **Holt, Niyah** / [niyah.holt@stu.fayette.kyschools.us](mailto:niyah.holt@stu.fayette.kyschools.us)  
**High School Student**



**Presentation 6**

Abstract Title: **The Descriptive Epidemiology of Colorectal Cancer**

Author(s): H. Williams, High School Student, Frederick Douglass High School; L. Schmidt, High School Student, Frederick Douglass High School; G. Wright, High School Student, Frederick Douglass High School

**Abstract:** Colorectal cancer is one of the leading causes of cancer-related deaths worldwide. The purpose of researching this cancer is to analyze the prevalence, risk factors, and prevention strategies associated with colorectal cancer through extensive peer-reviewed studies. This study examines data from 2017 to 2022. Focusing on Incidence and mortality rates, lifestyle influences, and screening effectiveness. This research also explains the background of colorectal cancer, describes symptoms, explains how the cancer is formed, and provides a general knowledge of what colorectal cancer is. Findings indicate that Kentucky has one of the highest incidence rates, likely due to dietary habits, lack of screening access, and genetic predisposition. This study discovered that Colorectal cancer is the 2nd-leading cancer death in the world, but that measures can be taken to reduce this number. Through things like healthier diets, regular exercise, and annual screenings, colorectal cancer can be limited and quickly stopped.

Supported by: Frederick Douglass High School Biomedical Sciences (BMS) Pathway

Primary Presenter / email: **Williams, Williams** / hchristiwilliams@gmail.com  
**High School Student**

## Frederick Douglass High School

### Presentation 7

Abstract Title: **Descriptive Epidemiology of Leukemia**

Author(s): V. Johnson, High School Student, Frederick Douglass High School; S. Jagannathan, High School Student, Frederick Douglass High School; H. Berlin, High School Student, Frederick Douglass High School

**Abstract:** Cancer remains a leading cause of death worldwide, responsible for millions of lives lost each year. Leukemia accounts for approximately 1.5% of all cancer-related deaths globally. The purpose of this research is to improve our knowledge in order to further understand the causes, development, and progression of Leukemia. This research was located by evaluating peer reviewed data from Kentucky Cancer registry, CDC, American Cancer Society, Mayo Clinic, Cancer Center, and Penn Medicine from the years 2017-2021. Nationally, Kentucky ranks 20th in leukemia incidence and 49th in mortality. Globally, the United States ranks 3rd for incidences and 116th in mortality. These findings underscore the burden of Leukemia, nationally and globally, emphasizing the need for continued efforts in prevention, early detection, and treatment.

Supported by: Frederick Douglass High School Biomedical Sciences (BMS) Pathway

Primary Presenter / email: **Johnson, Veda** / veda.johnson@stu.fayette.kyschools.us  
**High School Student**

**Presentation 8**

Abstract Title: **From Data to Action: Understanding Leukemia Trends and Prevalence**

Author(s): J. Squire, High School Student, Frederick Douglass High School; M. Bojang, High School Student, Frederick Douglass High School; C.J. Raglin, High School Student, Frederick Douglass High School

**Abstract:** Leukemia is a leading cause of cancer-related deaths in the United States. Understanding it gives insight into public health strategies that could improve patient outcomes. This research will push us in this direction by analyzing leukemia trends in Kentucky and the U.S. using peer-reviewed data from 2013 to 2022. This study examines leukemia screenings, incidence rates, mortality rates, and treatment effectiveness. The sources include the American Cancer Society and the Kentucky Cancer Registry. With these sources, a statistical analysis was conducted to identify patterns of leukemia over time. The standard error of the mean (SEM) was calculated to ensure accuracy, with sample sizes (n) varying across studies. The data indicated that not only does a direct genetic mutation have an impact on the development of leukemia, but so does chronological age and biological factors such as race, ethnicity, and gender. For example, white (including Hispanic) and older individuals (65+) are most susceptible to this cancer. Additionally, data shows that over time leukemia incidence specifically in the U.S. has remained high, and mortality rates have shown a gradual decline due to an improvement in treatment options. These findings suggest that leukemia is currently a prevalent problem in the U.S. and Kentucky. This research highlights the potential impact of furthering treatments by using personalized strategies and screenings depending on these factors. This also offers a foundation for future research that explores other factors such as the environment that influence leukemia prevalence.

Supported by: Frederick Douglass High School Biomedical Sciences (BMS) Pathway

Primary Presenter / email: **Squire, Julianna** / juliannasquire40@gmail.com  
**High School Student**

## Frederick Douglass High School

### Presentation 9

Abstract Title: **Epidemiology of Leukemia**

Author(s): L.E. Miner, High School Student, Frederick Douglass High School; N.T. Baidoo, High School Student, Frederick Douglass High School; T. Cayson, High School Student, Frederick Douglass High School

**Abstract:** Leukemia is one of the leading causes of cancer-affiliated deaths worldwide. This research aims to examine the epidemiology of Leukemia and identify trends that assist in classifying high-risk population groups by comparing incidence and mortality rates with known risk factors based on sex, age, and geography to help give an understanding of how to improve treatment efficacy and patient results. This study was conducted through a meta-analysis of results from studies subjected to expert review and data between 2016 and 2022. Findings indicated that not only genetics, such as rare congenital diseases, play a role in the incidence of Leukemia, but also race, chemicals, and other biological, behavioral, and environmental factors are contributing to the rising prevalence of Leukemia. Key observations reveal that despite the United States ranking fourth in Leukemia incidence rates on a global scale, Kentucky has one of the highest rates of Leukemia compared to the national average. Although incidence rates show an extensive issue, the decline in mortality rates shows improvement in treatments all around the United States. However, high mortality rates in states such as Kentucky, call attention to the lack of treatment progress in high-risk areas nationwide.

Supported by: Frederick Douglass High School Biomedical Sciences (BMS) Pathway

Primary Presenter / email: **Miner, Lucy** / [lucy.miner@stu.fayette.kyschools.us](mailto:lucy.miner@stu.fayette.kyschools.us)  
**High School Student**

**Presentation 10**

---

Abstract Title: **Descriptive Epidemiology of Lung Cancer**

Author(s): Elizabeth Deffendall, High School Student, Frederick Douglass High School; Emma Goodpaster, High School Student, Frederick Douglass High School; Logan Dunham, High School Student, Frederick Douglass High School.

---

**Abstract:** Lung cancer remains one of the most prevalent and deadly forms of cancer globally. This research focuses on analyzing its distribution and determinants within various populations. By examining peer-reviewed data and statistical reports, from the National Cancer Institute, The American Cancer Society, The Kentucky Cancer Registry, The Global Cancer Observatory, etc. To assess factors such as age, gender, ethnicity, and geographical location, that influence lung cancer incidence and mortality rates. Our findings highlight significant patterns and disparities. In Kentucky, particularly Eastern Kentucky, the highest incidence and mortality rates are linked to high tobacco use and coal mining activities. Globally, countries like Hungary, China, and Serbia show the highest prevalence, often associated with significant air pollution. Mortality rates are notably higher in Hungary, Turkey, and French Polynesia, likely due to tobacco use and challenges in diagnosis. In the U.S. and Canada, lung cancer is also prominent, with Canada experiencing higher mortality rates. Males are diagnosed with lung cancer at a higher rate than females across ethnicities. With White individuals being the most likely to develop lung cancer, followed by Non-Hispanic Black individuals as the second largest group. In the U.S., higher incidence rates are observed in the Southwest. Additionally, incidence rates increase significantly with age, with individuals over 40 experiencing higher rates compared to younger populations. These insights are crucial for developing targeted public health strategies for lung cancer prevention, early detection, and treatment.

---

Supported by: Frederick Douglass High School Biomedical Sciences (BMS) Pathway

Primary Presenter / email: **Deffendall, Elizabeth** / [elizabeth.deffendall@stu.fayette.kyschools.us](mailto:elizabeth.deffendall@stu.fayette.kyschools.us)  
**High School Student**

---

## Frederick Douglass High School

### Presentation 11

Abstract Title: **Kentucky's Lung Cancer Epidemic: By the Numbers**

Author(s): Ivory. Bobbitt, High School Student, Frederick Douglass High School; Amaria. Hall, High School Student, Frederick Douglass High School; Amira. David, High School Student, Frederick Douglass High School; Sue. Rayamajhi, High School Student, Frederick Douglass High School

**Abstract:** Lung cancer remains one of the leading causes of death in Kentucky, which has one of the highest incidence rates in the nation. This research aims to understand trends and outcomes of lung cancer to improve public health in Kentucky. This study analyzed peer-reviewed data on lung cancer screenings, incidence rates, mortality rates, and treatment effectiveness from 2016 to 2022. The sources used include the American Cancer Society and the Kentucky Cancer Registry. Using this data, a statistical analysis was conducted to identify patterns of lung cancer over time in Kentucky. The findings reveal that Kentucky has 83.3 new lung cancer cases per 100,000 people, significantly higher than the national rate of 49 per 100,000. The five-year survival rate for lung cancer patients in Kentucky is 23.9%, lower than the national average of 28.4%. Although early diagnosis rates have improved by 14% over the past five years, Kentucky continues to face challenges with early detection and treatment. This analysis highlights the stark contrast between Kentucky's high lung cancer rates and low survival rates compared to the national average. To address these issues, there is a pressing need for enhanced screening programs and stronger public health advocacy in Kentucky.

Supported by: Frederick Douglass High School Biomedical Sciences (BMS) Pathway

Primary Presenter / email: **Bobbitt, Ivory** / Kelly.Bobbitt@stu.fayette.kyschools.us  
**High School Student**

## Frederick Douglass High School

### Presentation 12

---

Abstract Title: **Lung Cancer Mortality in Kentucky: Analyzing Smoking Trends and Regional Variations**

Author(s): J. M. Colin, Frederick Douglass, A. M. Romero, Frederick Douglass, M. S. Zarate, Frederick Douglass

---

**Abstract:** Lung cancer remains a leading cause of mortality in Kentucky. This research aims to examine contributing factors by analyzing peer-reviewed data from 2019-2025. Findings indicate higher mortality in Eastern Kentucky due to smoking rates, coal mining exposure, and limited healthcare access.

---

Supported by: Frederick Douglass High School Biomedical Sciences (BMS) Pathway

---

Primary Presenter / email: **Ashly, Romero** / ashlyromero779@gmail.com  
**High School Student**

---

## Frederick Douglass High School

### Presentation 13

Abstract Title: **Epidemiological Trends in Non-Hodgkin Lymphoma: Analyzing Incidence, Mortality, and Disparities in the U.S. (2017–2022)**

Author(s): G. Ogunbayo, High School Student, Frederick Douglass High School; A. Doodnauth, High School Student, Frederick Douglass High School; K. Turner, High School Student, Frederick Douglass High School

**Abstract:** Cancer is one of the leading causes of death globally, and Non-Hodgkin Lymphoma (NHL) is one of the common forms of cancer. The aim of this study is to investigate the incidence and mortality rates of NHL in America and more specifically, the differences by place, race, and gender. This was achieved by analyzing peer-reviewed data from the Centers for Disease Control and Prevention (CDC), National Cancer Institute (NCI), and World Health Organization (WHO) from the years 2017 to 2022. Based on our findings, we have concluded that the incidence rates of NHL in the U.S. are approximately 19 per 100,000 people, with Kentucky being among the highest in incidence and mortality rates. Additionally, variations in treatment outcomes and diagnoses are also affected by exposures to the environment, access to health care, as well as comorbid illnesses like HIV. More males are diagnosed compared to females, possibly because of hormonal and biological differences. Mortality is high, especially among less developed countries with fewer oncology treatment centers. These results suggest focused prevention and greater access to healthcare to alleviate the NHL burden in the US.

Supported by: Frederick Douglass High School Biomedical Sciences (BMS) Pathway

Primary Presenter / email: **Grace, Ogunbayo** / [grace.ogunbayo@stu.fayette.kyschools.us](mailto:grace.ogunbayo@stu.fayette.kyschools.us)  
**High School Student**



**Presentation 14**

---

Abstract Title: **The Impacts of Non-Hodgkin's Lymphoma on Diverse Demographics**

Author(s): G. D. House, High School Student, Frederick Douglass High School; L. G. Cowing, High School Student, Frederick Douglass High School; H. Hughes, High School Student, Frederick Douglass High School

---

**Abstract:** Non-Hodgkin's Lymphoma is the 11th leading cause of death globally, primarily affecting populations of North America and Europe. The purpose of this research is to identify disparities in mortality and incidence across demographics and to assess equitable treatment approaches for individuals across numerous factors including age, race, and sex spanning over a state, national, and global level. This was conducted through a comprehensive analysis of peer-reviewed data from a diverse range of geographic sources, covering data from 2000 to 2022. Empirical evidence supports that in Kentucky, the highest incidence and mortality rates for Non-Hodgkin's Lymphoma predominantly target white males ages 60 and above. Additionally, the study examines the role of socioeconomic factors, and regional disparities in diagnosis and treatment. This will highlight links to correlated diseases and consider future intervention.

---

Supported by: Frederick Douglass High School Biomedical Sciences (BMS) Pathway

---

Primary Presenter / email: **House, Davis** / davis\_house@icloud.com  
**High School Student**

## Frederick Douglass High School

### Presentation 15

Abstract Title: **Descriptive Epidemiology of Pancreatic Cancer**

Author(s): K. Banther, High School Student, Frederick Douglass High School; A. Mcdowell, High School Student, Frederick Douglass High School; S. Gragg, High School Student, Frederick Douglass High School

**Abstract:** Cancer is a leading cause of mortality, it is responsible for many lives lost each year. The purpose of researching pancreatic cancer is to analyze the causes, the progression, and the global incidence. This was done by evaluating peer reviewed data from Mayo Clinic, Cleveland Clinic, American Cancer Society, and World Health Organization. This was important to evaluate different factors such as age, gender, ethnicity, and location to influence pancreatic cancer. The data indicates that the mortality rate for pancreatic cancer is 183.7 cases per 100,000 people. Our findings indicate that in Kentucky the highest mortality rate is in Eastern and Southern Kentucky. Globally places like the US, Europe, and Asia show the highest mortality rates. This research is crucial for pancreatic cancer prevention, early detection, and treatment.

Supported by: Frederick Douglass High School Biomedical Sciences (BMS) Pathway

Primary Presenter / email: **Banther, Keenan** / keenanbanther@stu.fayette.kyschools.us  
**High School Student**

## Frederick Douglass High School

### Presentation 16

Abstract Title: **Epidemiology of Prostate Cancer in the U.S.: Incidence Trends, Regional Disparities, and Screening Implications**

Author(s): K.A. Bueno, High School Student, Frederick Douglass High School; M. L. Bonarigo, High School Student, Frederick Douglass High School; P. L. Sproul, High School Student, Frederick Douglass High School

**Abstract:** Prostate cancer is one of the most commonly diagnosed malignancies among men worldwide and a leading cause of cancer-related mortality. In the United States, it is the second most frequently diagnosed cancer in men, with an incidence rate of approximately 112–115 cases per 100,000 individuals. Despite advances in early detection and treatment, prostate cancer remains a significant public health concern. This study aims to analyze the prevalence and impact of prostate cancer in the U.S., with a specific focus on Kentucky. A comprehensive meta-analysis was conducted using peer-reviewed data from 2015 to 2021 to assess incidence trends and regional disparities. Findings indicate that Kentucky ranks moderately in prostate cancer incidence, while the U.S. continues to report some of the highest rates globally. These results underscore the need for enhanced screening programs, public awareness initiatives, and targeted interventions to reduce morbidity and mortality associated with prostate cancer.

Supported by: Frederick Douglass High School Biomedical Sciences (BMS) Pathway

Primary Presenter / email: **Bueno, Kenneth** / [kenneth.bueno@stu.fayette.kyschools.us](mailto:kenneth.bueno@stu.fayette.kyschools.us)  
**High School Student**

## Frederick Douglass High School

### Presentation 17

Abstract Title: **Prevalence and Mortality of Renal Cancer in Different Geographical Demographics: A Meta-Analysis**

Author(s): A. W. Ricks, High School Student, Frederick Douglass High School; S. S. DeFreitas, High School Student, Frederick Douglass High School; R. D. Matcheswala, High School Student, Frederick Douglass High School

**Abstract:** Renal cancer is a leading cause of mortality in the 21st century. Renal cancer accounts for about 3% of all adult cancers. The American Cancer Society estimates that there will be about 79,000 new cases of kidney cancer in 2025. The purpose of this research is to inform the public about the prevalence of renal cancer in the United States. A meta analysis was conducted by analyzing peer reviewed data from 2018 to 2022. Findings conclude that Kentucky ranks 5th for mortality, while the United States ranks 14th for mortality due to renal cancer.

Supported by: Frederick Douglass High School Biomedical Sciences (BMS) Pathway

Primary Presenter / email: **Ricks, Addison** / awricks22@gmail.com  
**High School Student**

## Frederick Douglass High School

### Presentation 18

Abstract Title: **Unmasking Kidney Cancer: Awareness, Prevention, and Treatment**

Author(s): P. A. Lehmann, High School Student, Frederick Douglass High School; A. G. Adkins, High School Student, Frederick Douglass High School; C. P. Dominguez, High School Student, Frederick Douglass High School

**Abstract:** Cancer is one of the leading causes of death worldwide, accounting for nearly ten million deaths annually. Kidney cancer accounts for about 180,000 of those deaths per year. This research examines how factors like age, gender, and obesity can increase the risk of developing kidney cancer. A meta-analysis done using peer-reviewed data from 2016 to 2022 found that Kentucky ranks fourth highest in new kidney cancer incidences and mortality compared to other states. Central and Western Kentucky have higher incidence rates, while Eastern Kentucky has higher mortality rates. Globally, the United States is ranked fourth in new incidence and forty-ninth in mortality rates. Specifically, the United States has higher incidence rates in the Middle Eastern States, and higher mortality rates in the Southern states. These findings highlight the need for increased awareness to effectively combat kidney cancer.

Supported by: Frederick Douglass High School Biomedical Sciences (BMS) Pathway

Primary Presenter / email: **Lehmann, Piper** / [piper.lehmann@stu.fayette.kyschools.us](mailto:piper.lehmann@stu.fayette.kyschools.us)  
**High School Student**

**Presentation 19**

---

Abstract Title: **Epidemiology of Renal Cancer of the Kidneys on Populations**

Author(s): H. M. Rhodus, High School Student, Frederick Douglass High School; K. L. Ridenour, High School Student, Frederick Douglass High School; K. A. Rogers, High School Student, Frederick Douglass High School;

---

**Abstract:** Kidney and renal cell carcinoma (RCC) are among the leading causes of mortality globally and the third highest incidence is observed within the state of Kentucky in the United States. The kidneys which have the primary function of filtering blood and excreting metabolic wastes in the form of urine, are the primary site of renal cell carcinoma. This research aims to explore the relationship between the rates of renal cell carcinoma and demographic factors such as race and gender in local, national, and global populations. A retrospective analysis of peer reviewed data from 2000 to 2022 showed that there was a statistically significant race disparity in the incidence of renal cell carcinoma, with African Americans having a higher incidence than White Americans in the United States. Findings indicate that part of this disparity may be explained by the fact that African Americans have a higher prevalence of the genetic predispositions: hypertension, diabetes, and obesity, all of which are known risk factors for renal disease and consequently, renal cell carcinoma. These predispositions may contribute to the increased susceptibility of this population to the development of renal cell carcinoma.

---

Supported by: Frederick Douglass High School Biomedical Sciences (BMS) Pathway

---

Primary Presenter / email: **Rhodus, Haley** / [haleyrhodus@yahoo.com](mailto:haleyrhodus@yahoo.com)  
**High School Student**

## Frederick Douglass High School

### Presentation 20

Abstract Title: **Descriptive Epidemiology of Thyroid Cancer**

Author(s): T. B. Walter, High School Student, Frederick Douglass High School; J.R. Cole, High School Student, Frederick Douglass High School; S.M. Glass, High School Student, Frederick Douglass High School;

**Abstract:** Cancer remains one of the leading causes of death worldwide. This research aims to investigate the epidemiology of thyroid cancer across a diverse population and various contributing factors. The study is based on an analysis of peer-reviewed data collected from 2010 to 2022. The findings reveal that the United States ranks fifth globally in incidence rates of thyroid cancer, while the state of Kentucky closely mirrors the national average, positioning it in the middle compared to other states.

Supported by: Frederick Douglass High School Biomedical Sciences (BMS) Pathway

Primary Presenter / email: **Walter, Tyler** / tyler.walter2@stu.fayette.kyschools.us  
**High School Student**

**Presentation 21**

Abstract Title: **Assessing and Evaluating the Epidemiology of Thyroid Carcinoma**

Author(s): B.G. Sadler, High School Student, Frederick Douglass High School; E.G. Brock, High School Student, Frederick Douglass High School; J. Doleman, High School Student, Frederick Douglass High School

**Abstract:** Thyroid Carcinoma is ranked as the 9th most common cancer in the United States, with Kentucky's incidence rate slightly exceeding the national average by 0.8 cases per 100,000 people. This micro analysis examines the differences in incidence and mortality rates across various demographic cohorts based on peer-reviewed epidemiological data from 2017 to 2022. Findings show that in the U.S., three out of four new thyroid cancer cases are diagnosed in women, however, the mortality rate for men is 1.5 to 2 times higher than for women, suggesting potential disparities in treatment response. Additionally, while Black Americans are 75-80% less likely to be diagnosed with thyroid cancer compared to White (non-Hispanic) Americans and Pacific Islanders, they are more likely to be diagnosed at later stages, leading to a 10% lower survival rate. This underlines the need for further investigation into why these disparities occur among the varying demographic cohorts.

Supported by: Frederick Douglass High School Biomedical Sciences (BMS) Pathway

Primary Presenter / email: **Sadler, Brooklynn** / Brooklynsadler8@gmail.com  
**High School Student**



---

Abstract Title: **Descriptive Epidemiology of Thyroid Cancer**

Author(s): E.G. Otto, High School Student, Frederick Douglass High School; J.A. Maxwell, High School Student, Frederick Douglass High School

---

**Abstract:** Cancer represents a significant public health challenge in both Kentucky and the United States. This research aimed to investigate the geographic and demographic disparities in cancer incidence, with the goal of identifying potential risk factors and enhancing early detection strategies across diverse populations. A retrospective analysis was done, using peer-reviewed data spanning the years 2010 to 2020. The findings revealed a notable disparity in thyroid cancer incidence rates between genders. Specifically, female populations exhibited higher rates compared to males across all age cohorts, both within Kentucky and the broader United States. Notably, the highest incidence rates were consistently observed among women aged 45 to 64 years in both Kentucky and the national data. These observations show the importance of targeted research and public health initiatives to address the observed variations in cancer incidence. By identifying the underlying factors contributing to these disparities, it may be possible to develop more effective prevention and intervention strategies.

---

Supported by: Frederick Douglass High School Biomedical Sciences (BMS) Pathway

---

Primary Presenter / email: **Otto, Elizabeth** / [elizabethotto2007@icloud.com](mailto:elizabethotto2007@icloud.com)  
**High School Student**

---

Presentation **23**

Abstract Title: **Mandated Reporting/Community Supporting: Exploring Responses to Child Abuse and Neglect Reports**

Author(s): Clark, S.L., College of Social Work, U of Kentucky; Riley, E., College of Public Health, U of Kentucky; McGladrey, M., College of Public Health, U of Kentucky; Theile, K., College of Social Work, U of Kentucky; Rogers, C., College of Social Work, U of Kentucky; Aguilar, C., College of Social Work, U of Kentucky; & Gugliemino, H., College of Social Work, U of Kentucky

**Abstract:** Background: There is growing support for implementing community-based approaches to child abuse and neglect to address limitations in child welfare systems' ability to ensure child safety while preserving family unity. This study explored human service professionals' attitudes, beliefs, and practices regarding traditional mandated reporting and envisioned future-state community supporting approaches to working with families when there are concerns related to child abuse and/or neglect.

Method: Data were collected via 12 in-depth focus groups with 68 human service professionals working in a variety of sectors across Kentucky. Focus group transcripts were analyzed using template analysis in Dedoose. Based on these findings, a pilot scale is being developed to measure professionals' affinity toward mandated reporting versus community supporting.

Results: Template analysis identified differing patterns in attitudes, practices, and training among participants favoring mandatory reporting vs. community supporting responses to potential child maltreatment. Participants inclined toward mandated reporting prioritized ensuring children's safety and reducing perceived risks, often viewing parents as unable to meet basic needs. In contrast, those in favor of community supporting emphasized resource connection, early intervention, and community involvement, viewing parents as capable but in need of concrete supports. Face validity of wording of pilot affinity scale items is being assessed with focus group participants and relevant agency leadership to prepare the scale for future psychometric validation.

Implications: This study aligns with family-centered, strengths-based efforts to transform child welfare systems into more supportive, less punitive structures by characterizing the range of professionals' perceptions and practices in response to potential child maltreatment.

Supported by: This presentation was supported by the National Center for Research Resources and the National Center for Advancing Translational Sciences, National Institutes of Health, through Grant UL1TR001998. The content is solely the responsibility of the authors and does not necessarily represent the official views of the NIH.

Primary Presenter / email: **Clark, Shelby** / shelby.clark@uky.edu  
**Faculty**  
**Community Research**  
**Behavioral Research**

Presentation **24**

Abstract Title: **Analyzing the Effects of Social Determinants of Health on Dental Caries**

Author(s): Gdovka, Ava, Grubbs, Angela, DNP, APRN, Omran, Nasreen, MS, RD, LD, Plasencia, Julie, PhD, RDN, LD

**Abstract:** Background: Social determinants of health (SDOH) are non-medical factors that affect health outcomes. Social determinants of health include the conditions in which people live, grow, and work in (Crear-Perry, J., Correa-de-Araujo, R., Lewis Johnson, T., McLemore, M. R., Neilson, E., & Wallace, M. 2021), as well as ethnic and cultural background. The purpose of this study is to determine the relationship between social determinants of health and the prevalence of dental caries in patients seen at a university based dental clinic.

Methods: A retrospective chart review was conducted on 65 patients who visited a interprofessional dental clinic between May 2024 and December 2024. A screening tool was given to patients to collect information regarding social determinants of health, specifically asking about housing, food insecurity, access to transportation, utilities, and intimate partner violence. A physical and oral exam was performed on each patient to determine health status and measure any dental caries.

Results: Currently being reviewed and data will be available at the time of the presentation.

Conclusion: Will be available at the time of presentation.

Supported by:

Primary Presenter / email: **Gdovka, Ava** / Argd222@uky.edu  
**Undergraduate Student**  
**Basic Research**  
**Behavioral Research**

Presentation **25**

Abstract Title: **Death: Personal Choice vs. Predestined Outcome**

Author(s): S. K. Hieneman, Department of Biology, U of Kentucky

**Abstract:** Fear of death in America has developed a stigma to "prolong life" regardless of what extensive measures are taken. Many factors contribute to this unhealthy mindset. This study aims to change the narrative by addressing ethical questions and disparities surrounding end-of-life care. The foundation of one's understanding of death starts with the knowledge and application of basic biomedical ethical principles: autonomy, beneficence, nonmaleficence, and justice. These principles play a big role in the proper timing of potentially withholding or withdrawing life-sustaining interventions. Additionally, a major controversial topic across the United States is the accessibility of euthanasia or medical aid in dying (MAID). Most of America believes that MAID takes the act of "free will" too far and crosses religious and moral boundaries. Physicians also must maintain their promise stated in the Hippocratic oath and do no harm to their patients. They have a right to refuse a requested treatment and suggest another route of symptom management if they believe their patient's wishes will not be beneficial. Additionally, national underutilization of palliative and hospice services highlights the death illiteracy in America. The lack of advocacy and education of comfort care in terminally ill patients has many repercussions, including socioeconomic burdens and equity disparities among various cultures. However, the sooner citizens become comfortable with the concept of mortality, the sooner America can overcome the standard of institutionalized dying. Healthcare workers should always keep a patient's best interest at heart, while also considering what defines a "good quality of life" for every individual.

Supported by:

Primary Presenter / email: **Hieneman, Sydney** / [skhi229@uky.edu](mailto:skhi229@uky.edu)  
**Undergraduate Student**  
**Clinical Research**  
**Behavioral Research**

Presentation **26**

Abstract Title: **Individual and Community-level Barriers and Needs for Management of Chronic Disease in Rural Appalachian Kentucky**

Author(s): B. L. Smalls, Department of Family and Community Medicine, College of Medicine, U of Kentucky; K. C. Akwari, College of Medicine, U of Kentucky; V. E. Kopelen, College of Public Health, U of Kentucky; A. J. Kruse-Diehr, Department of Family and Community Medicine, College of Medicine, U of Kentucky

**Abstract:** Background: Appalachian Kentucky experiences significant disparities that contribute to unequal health outcomes in the management of chronic conditions, including limited health care access, inadequate health education, poor dietary resources, and low social support. Our study sought to identify unique regional factors contributing to these barriers and feasible methods to mitigate them.

Method: We conducted interviews with residents in one rural Appalachian Kentucky to map networks and resources specific to the county and surrounding region. Participants were asked to describe resources that helped or hindered their access to health care and identify qualities they perceived as most important for effective healthcare leaders in formal and informal (i.e., community) settings. Data were transcribed verbatim and analyzed using thematic analysis.

Results: Among the 79 interviewees, most were long-term residents of the region, and about half reported large family social networks. Participants noted several barriers to managing chronic disease, including medical distrust, limited health education, restricted access to care, and challenges with affordability and transportation. Participants cited the need for both general health education and, specifically, diabetes education and emphasized the need for trustworthiness and open-mindedness in individuals providing these services.

Discussion: These findings highlight barriers to managing chronic disease in Appalachian Kentucky and underscore the need for increased education, particularly from individuals familiar with regional socioeconomic and healthcare barriers. Our next step is to utilize these findings to develop a contextually relevant behavioral health intervention leveraging identified community strengths, such as social networks and peer support, to improve regional chronic disease outcomes.

Supported by: Social Network Analysis and Social Support Intervention for Rural Dwelling Older Adults with T2DM; NIDDK 5K01DK116923-05; PI: Smalls

Primary Presenter / email: **Kruse-Diehr, Aaron** / kruse-diehr@uky.edu  
**Faculty**  
**Community Research**  
**Behavioral Research**

Presentation **27**

Abstract Title: **Translational Research in Action: Challenges and Solutions of Implementing an Innovative Diabetes Prevention Program**

Author(s): E. R. Karle, College of Nursing, U of Kentucky; D. Cozart, College of Nursing, U of Kentucky; L. B. Williams, College of Nursing, U of Kentucky

**Abstract:** Black adults have the lowest adjusted weight loss among participants in Diabetes Prevention Programs (DPPs). Reasons for disparities are complex, with social determinants as key contributors. The purpose of this study is to describe the challenges and lessons learned while conducting an innovative precision health DPP among Black congregations during the COVID-19 pandemic. We provide practical strategies to inform the delivery of future church-based interventions. Faith-based settings are poised to identify and address unmet social determinants. Researchers have leveraged their trust and influence to implement health equity interventions. However, there is a literature gap regarding the challenges and lessons learned while conducting church-based trials. We conducted a randomized DPP trial among 20 churches (N=402). Trained community health workers (CHWs) delivered a virtual group-based 18-session DPP to both project arms. Additionally, non-responders (defined as losing  $\leq 1\%$  weight at intervention week four) in the intervention arm only received a weekly telephone call to deliver an individual-level motivational interviewing intervention to overcome weightloss barriers. During the conduct of the 5-year trial, we maintained detailed field notes and meeting minutes. We independently reviewed, coded, and categorized the data by challenges and strategies into themes and then met to reach a consensus. Three major themes emerged related to challenges: COVID-19-related protocol revisions, church logistics, and intervention delivery. Strategies included: adapting the intervention to virtual delivery, balancing virtual intervention delivery with frequent personal check-ins, extending the project startup time to provide ample time for recruitment and coordination of church calendars, flexible CHW training session times, and establishing codified internal team codifying team processes. Frequent communication and collaboration with church leaders aided in maintaining fidelity

Supported by: National Institutes of Health NIDDK award: R01DK125801 and registered at Clinicaltrials.gov (#NCT04757519)

Primary Presenter / email: **Karle, Erika** / erika.karle@uky.edu  
**Graduate Student**  
**Health Equity Research**  
**Behavioral Research**

Presentation **28**

Abstract Title: **Coping with Race-Related Stress: A Scoping Review of Strategies Used by Black Youth**

Author(s): A.C. Sullivan, College of Social Work, U of Kentucky; S., Barnhart, College of Social Work, U of Kentucky; L. Conner, College of Social Work, U of Kentucky; K.J. Watts, College of Social Work, U of Kentucky; K. E. Clark, College of Social Work, U of Kentucky

**Abstract:** Background: Race-related stress negatively impacts the psychological, emotional, and physical well-being of Black youth, both immediately and long-term. Coping strategies are essential in mitigating these effects, yet the ways Black youth manage race-related stress remain underexplored.

Objective: This scoping review examined the emotion- and problem-focused coping strategies used by Black youth (ages 10–18) in response to race-related stress. Additionally, it explored potential gender differences in coping mechanisms.

Design: Following the PRISMA framework, a systematic search of PsycINFO, PubMed, and Google Scholar identified relevant studies published through October 20, 2023. Twelve studies met the inclusion criteria.

Results: Most studies utilized cross-sectional designs (n = 6), with others employing longitudinal (n = 4), qualitative (n = 1), or mixed-methods (n = 1) approaches. Black youth employed various coping strategies to manage race-related stress. Seeking social support emerged as the most common problem-focused coping strategy. Emotion-focused strategies included rumination, distancing, and distraction. Gender differences were observed, with female-identifying youth more likely to use emotion-focused coping, while male-identifying youth more frequently engaged in avoidance-based coping.

Conclusion: Findings highlight the diverse coping strategies Black youth employ in response to race-related stress. However, further research is needed to explore a broader range of stressors and assess the effectiveness of different coping strategies across various contexts. Expanding this research will help develop targeted interventions that better support Black youth.

Keywords: race-related stress, coping strategies, racism, Black or African American, youth, adolescents

Supported by:

Primary Presenter / email: **Sullivan, Alisia** / [actayl2@uky.edu](mailto:actayl2@uky.edu)  
**Graduate Student**  
**Health Equity Research**  
**Behavioral Research**

Presentation **29**

Abstract Title: **Time-restricted Eating Advances Meal Timing in Postmenopausal Women**

Author(s): J. M. Thomas, Department of Biology, U of Kentucky; P. A. Kern, Internal Medicine, U of Kentucky; D. D. Sears, College of Healthy Solutions, Arizona State U; S. E. Armstrong, Biomedical Informatics, U of Kentucky; C. Bumgardner, Biomedical Informatics, U of Kentucky; C. Murray, Department of Biology, U of Kentucky; C. J. Russell, Department of Biology, U of Kentucky; J. S. Pendergast, Department of Biology, U of Kentucky

**Abstract:** Late meal and sleep timing are associated with metabolic risk in postmenopausal women. Therefore, interventions that advance the timing of last meal and sleep may reduce metabolic risk in this population. Time-restricted eating (TRE), a circadian behavioral intervention that corrects disrupted eating rhythms by aligning food intake with daytime to improve metabolic health, has not been studied in metabolically unhealthy postmenopausal women. Here we investigated the effect of a TRE intervention on night eating and sleep timing in 36 metabolically unhealthy postmenopausal women (mean age 57.9 years). First and last mealtimes were collected for 2 weeks at baseline and 16 weeks after randomization to a control group that maintained their usual meal timing (N=18) and the TRE intervention group that consumed all calories during a 10h window (N=16). At baseline, participants ate at night with average time of last calories at 8:48pm. After 16 weeks in the study, the time of last calories was unchanged in the control group, while it was 1.5h earlier in the TRE group. The TRE intervention did not affect the time of sleep onset. Since food intake closer to bedtime is associated with obesity, we assessed time lapse between last calories and sleep onset. At baseline, the time of last calories occurred 2.3h before sleep onset. Participants in the TRE intervention consumed their last calories 3.9h before sleep onset. Overall, we find that TRE reduces night eating in postmenopausal women, which may be a novel therapeutic to improve metabolism in this at-risk group.

Supported by: Research reported in this abstract was supported by the National Institute of Diabetes and Digestive and Kidney Diseases, the National Institute on Aging, and the National Center for Advancing Translational Sciences, of the National Institutes of Health, under award number R01DK124774, T32 AG078110, and UL1TR001998. The content is solely the responsibility of the authors and does not necessarily represent the official views of the National Institutes of Health.

Primary Presenter / email: **Thomas, Matt** / jmthomg@uky.edu  
**Postdoctoral Scholar/Fellow**  
**Clinical Trial**  
**Behavioral Research**



Presentation **30**

Abstract Title: **Predictors of Post-Incarceration Primary Care Utilization Among Women with Opioid Use Disorder**

Author(s): M. A. Webster, Department of Psychology, U of Kentucky; M. Tillson, Department of Behavioral Science, U of Kentucky; M. Staton, Department of Behavioral Science, U of Kentucky.

**Abstract:** Purpose: Women with opioid use disorder (OUD) face a variety of barriers to healthcare utilization post-incarceration. Primary care providers (PCPs) can serve as a bridge connecting women with other health-promotion services, such as OUD treatment and preventive screenings. Therefore, this project seeks to identify support factors that predict engagement with PCPs post-incarceration to inform future treatment linkage efforts among this population.

Methods: Women from nine Kentucky jails were randomly selected, screened for OUD, and interviewed while incarcerated and at three months post-release from jail (N=781). Baseline measures included the validated Multidimensional Scale of Perceived Social Support (MSPSS) with subscales for support from significant others, family, and friends, as well as the Brief Assessment of Recovery Capital (BARC). Bivariate analyses and logistic regression were used to analyze these measures as correlates of PCP visits post-incarceration reported at follow-up.

Results: At follow-up, 31.1% of participants reported a PCP visit. Independent samples t-tests demonstrated significant positive associations between post-incarceration PCP utilization and MSPSS significant other ( $t[777]=-2.160, p=0.031$ ) and family ( $t[774]=-2.206, p=0.028$ ) subscores, and recovery capital ( $t[777]=-2.152, p=0.032$ ). Logistic regression confirmed these relationships remained significant after controlling for demographic covariates and pre-incarceration PCP visits. No significant association was observed between post-incarceration PCP visits and perceived support from friends.

Conclusion: Findings suggest that social support from significant others and family as well as recovery capital may facilitate women's access to primary care post-incarceration. Future research should examine how recovery capital, including community connection and supportive resources, can be leveraged to further facilitate primary care utilization.

Supported by: NIH grant award: UG1DA050069

Primary Presenter / email: **Webster, Marguerite** / mawe267@uky.edu  
**Graduate Student**  
**Basic Research**  
**Behavioral Research**

Presentation **31**

Abstract Title: **Designing and Implementing a Black Feminist Health Equity Project: A Focus on Reproductive Justice**

Author(s): S.Thorpe, Department of Kinesiology & Health Promotion, U. of Kentucky; N. Malone, Department of Educational, School, and Counseling Psychology, U. of Kentucky

**Abstract:** Black feminist frameworks offer critical tools for addressing health inequities by centering the lived experiences and voices of Black women. This presentation will explore the process of designing and implementing a Black feminist health equity research project, focused on the experiences of Black queer women couples who have used assisted reproductive technologies in five states. This presentation will highlight strategies for building community partnerships, building rapport, and community and art-based dissemination efforts. Drawing on principles of intersectionality, community-based participatory research (CBPR), and reproductive justice, we will discuss how Black Feminist Thought can guide project development, data collection, and dissemination in ways that prioritize the voices and needs of those most impacted by inequities--Black women. Attendees will leave with tangible outcomes, including a step-by-step guide for integrating Black feminist principles into their own research projects, strategies for building authentic community partnerships, and examples of how to translate research findings into meaningful interventions, social media content, and community based workshops.

Supported by: Funding was provided by the the UNited In True Equity Research Priority Area at the University of Kentucky

Primary Presenter / email: **Thorpe, Shemeka** / shemeka.thorpe@uky.edu  
**Faculty**  
**Health Equity Research**  
**Behavioral Science**

Presentation **32**

Abstract Title: **Survival of Patients Diagnosed with Cancer in the US during the First Year of the COVID-19 Pandemic**

Author(s): T. Burus, Markey Cancer Center; H. Damgacioglu, Hollings Cancer Center; B. Huang, Markey Cancer Center; T. C. Tucker, Markey Cancer Center; A. A. Deshmukh, Hollings Cancer Center; K. A. Lang Kuhs, Markey Cancer Center

**Abstract:** Purpose: The effects of COVID-19 pandemic-related disruptions on cancer diagnosis in the United States have been widely observed, but their impact on short-term survival have not been assessed. Methods: We included individuals with a first primary malignant cancer diagnosis and complete follow-up reported in the Surveillance, Epidemiology, and End Results 22 Registries database between January 1 and December 31, 2020. We calculated one-year cause-specific survival (CSS) and compared it to one-year CSS among patients diagnosed in 2019. We also estimated excess deaths within one year of diagnosis in 2020 assuming CSS remained the same as in 2019. Additional site-specific analyses were performed on common cancer sites identified as having low-survival (5-year relative survival <33%) or high-incidence/high-survival (incidence >20.0 per 100,000 and 5-year survival  $\geq$ 66%). Results: Patients diagnosed with cancer in 2020 had a one-year CSS of 83.70% (95% confidence interval (95%CI), 83.60%-83.80%) which was a significant 1.21% lower than in 2019 (95%CI, 1.07%-1.35%) and resulted in 5899 excess deaths (95%CI, 5213-6586). All five high-incidence/high-survival cancer sites examined, and three-out-of-five low-survival sites, had significant CSS reductions compared to 2019, ranging from 0.21% lower for female breast cancer (95%CI, 0.04%-0.37%) to 2.77% lower for liver cancer (95%CI, 1.50%-4.03%). The greatest number of excess deaths occurred for colorectal cancer (754; 95%CI, 561-947) and lung cancer (508; 95%CI, 219-797). Conclusion: Individuals diagnosed with cancer in 2020 experienced poorer short-term survival than those diagnosed in 2015-2019, suggesting substantial harms related to cancer care disruptions during the first year of the COVID-19 pandemic.

Supported by: n/a

Primary Presenter / email: **Burus, Todd / tburus@uky.edu**  
**Graduate Student**  
**Other**  
**Cancer**

Presentation **33**

Abstract Title: **PLK1- Phosphorylation of OCT4 Induces Tran differentiation of Neuro Endocrine Prostate Cancer from CRPC**

Author(s): M. Esfani Farahani, Y. Zhang, and X. Liu\*, Department of Toxicology and Cancer Biology, College of Medicine, University of Kentucky, Lexington, KY 40506, USA.

**Abstract:** Prostate cancer is ranked the most prevalent malignancy and is the leading cause of cancer-related deaths among US males. Recently, the emergence of a novel sub-type of prostate cancer, referenced as neuronal endocrine prostate cancer (NEPC). NEPC is currently an aggressive and quickly progressing disease, and classical clinical intervention fails to prevent disease progression resulting in decreased patient survival. NEPC phenotypic switch often coincides with the gain of drug resistance to conventional therapies, such as second-generation anti-androgen inhibitors, illustrating the urgency to elucidate the underlying molecular mechanisms driving this transformation and further expand biological tumor markers. PLK1 (Polo-like Kinase 1) plays a classical role in cell cycle progression, specifically mitotic entry, and has been reported to play a pivotal role in prostate cancer progression. Due to its phosphorylation ability, PLK1 has been found to manipulate various genes causing dysregulation of multiple pathways, including pathways involved in pluripotency maintenance. OCT4 is a pluripotent transcription factor that has implications for cancer cell proliferation and acts as a cancer stem cell activation marker. In this study, we have found that PLK1 phosphorylates OCT4 and causes its degradation. In CRPC cells we have found that by enzalutamide treatment we can see elevation in both stemness markers and NE markers, However, with prolonged treatment, stemness markers diminish while NE markers remain elevated. In NEPC cells N2P1 either knocks down or degrades OCT4 causing an elevation in MYC and NE markers. In conclusion, targeting the PLK1-OCT4 axis could represent a promising therapeutic strategy to mitigate the progression of NEPC and improve patient outcomes.

Supported by:

Primary Presenter / email: **Esfani Farahani, Mohammad** / Mesfarahani@uky.edu  
**Graduate Student**  
**Translational**  
**Cancer**

Presentation **34**

Abstract Title: **Spatial Transcriptomic Characterization of Pediatric Brain Tumors in Kentucky**

Author(s): Jinpeng Liu<sup>1</sup>, Doug Harrison<sup>2</sup>, Janna Neltner<sup>3</sup>, Lexee K. Long<sup>4</sup>, Dana Napier<sup>1</sup>, Ryan N. Vincent<sup>5</sup>, Lisa A. Witt<sup>6</sup>, Jong Cheol Jeong<sup>1,8</sup>, Sally R. Ellingson<sup>1,8</sup>, Shulin Zhang<sup>3</sup>, Therese J. Bocklage<sup>1</sup> Christine Brainson<sup>7</sup>, John L. Villano<sup>1</sup>, Thomas Tucker<sup>1</sup>, Eric Durbin<sup>1,4,8</sup>, Chi Wang<sup>1</sup>; <sup>1</sup>Markey Cancer Center; <sup>2</sup>Department of Biology; <sup>3</sup>Pathology and Laboratory Medicine; <sup>4</sup>Kentucky Cancer Registry; <sup>5</sup>Clinical Molecular & Genomic Pathology Lab; <sup>6</sup>College of Medicine; <sup>7</sup>Toxicology and Cancer Biology; <sup>8</sup>Biomedical Informatics

**Abstract:**

Background: Childhood brain tumors are the leading cause of cancer-related deaths in children and adolescents, comprising approximately 20% of all childhood cancers. Kentucky children, particularly those in Appalachian regions, bear a disproportionately high burden of pediatric brain tumors. To address this, we conducted a population-based study to characterize pediatric brain tumors at the spatial transcriptomic level. Methods: We used 10X Genomics' Visium Spatial Transcriptomics technology to dissect intratumoral and intertumoral heterogeneity for over 50 tumor specimens including astrocytomas, ependymomas, and medulloblastomas. At single-sample level, we characterized intratumoral heterogeneity including pathological annotation to map spatial transcriptomic data onto histological features, spatially aware clustering to identify transcriptionally distinct tumor subregions, cell composition analysis to determine the spatial organization of immune, stromal, and malignant cell populations and tumor trajectory modeling to infer tumor infiltration path. At cohort level, we performed sample-wise integration to identify recurrent transcriptional programs and compared their distributions across tumor grades. Results: Our findings reveal distinct transcriptional regions within individual tumors and transcriptional gradients at the tumor infiltration front. Integration across tumor types highlights significant variations in cellular composition. We identified 6 distinct transcriptional programs related to tumor, immune, hypoxia, neuronal, glial and vascular features. Notably, in astrocytoma, grade 1 tumors show a higher fraction of immune-associated regions compared to grade 4 tumors. These insights provide a foundation for future studies on pediatric brain tumor biology and potential therapeutic targets.

Supported by: NIH KL2 grant (KL2TR001996),BBSRF, MCC: [P30CA177558]

Primary Presenter / email: **Liu, Jinpeng** / merckey@gmail.com  
**Faculty**  
**Community Research**  
**Cancer**

Presentation **35**

Abstract Title: **Extracellular Vesicles Derived from Glioblastoma After Radiation Promote Microglia-Mediated Neurotoxicity**

Author(s): S.L.M. Palacio, Toxicology and Cancer Biology (DTCB), U of Kentucky; N. Rummel, Chemistry, U of Kentucky; J. Campbell, DTCB, U of Kentucky; D.A. Butterfield, Chemistry, U of Kentucky; S. Bondada, Microbiology, Immunology and Molecular Genetics, U of Kentucky; H. Weiss, Internal Medicine, U of Kentucky; J. Villano, Neuro-Oncology, U of Kentucky, I. Batinic-Haberle, Radiation Oncology, Duke University, Durham, NC; D.K. St. Clair, DTCB, U of Kentucky; L. Chaiswing, DTCB, U of Kentucky

**Abstract:** Little is known about the underlying mechanisms of glioblastoma (GBM) and/or therapy-derived cognitive impairment. Our data indicates that GBM patients exhibit higher numbers of extracellular vesicles (EVs) compared to non-cancer patients and levels of EVs release increase after radiation therapy (RT). These radiation derived EVs (RedoxEVs), contain high levels of highly reactive 4HNE which participates in pathological processes. Since EVs can be messengers between cells, we seek to elucidate if GBM-derived RedoxEVs trigger glial cells to induce neurotoxicity. We evaluated if microglial cells (HMC3) would uptake RedoxEVs. EVs were collected from LN18-RFP, a GBM cell line transfected to express RFP in the plasma membrane. After adding the EVs to HMC3, confocal images showed that EVs are taken up within minutes and they spread evenly. Additionally, RedoxEVs caused microglial activation, especially a significant increase in H<sub>2</sub>O<sub>2</sub> production. When we co-cultured these RedoxEVs-activated microglia cells with neurons (HCN2), cell viability of HCN2 cells was significantly reduced but this was rescued by pre-treating them with catalase. Next, we tested if altering the microglial redox state using BMX-001 (an MnSOD mimetic, currently in clinical trials for high-grade gliomas), could mitigate glial cells activation. Adding BMX-001 in combination with RT increased the levels of 4HNE-adducted proteins in GBM cells but decreased them in microglial cells. Cytokines were measured as markers of microglia activation and inflammatory response. Data suggest that H<sub>2</sub>O<sub>2</sub> released from microglia could be a key for RedoxEV-mediated neuronal injury and that BMX-001 could reduce damage from GBM and GBM therapy to non-cancer cells.

Supported by: Startup fund to L.C., Department of Radiation Medicine and Markey Cancer Center 2023  
Collaborative Bench to Bedside Pilot Grant Award, R01 CA217934 to D.S, University of Kentucky  
CNS Metabolism (CNS-Met) COBRE-NIGMS (P20 GM148326) from NIH

Primary Presenter / email: **Macias Palacio, Sara** / sma320@uky.edu  
**Graduate Student**  
**Translational Research/Science**  
**Cancer**

Presentation **36**

Abstract Title: **Kentucky Women with Disabilities and Cancer Screening: Differences in Knowledge, Beliefs & Feelings.**

Author(s): S.D Regnier, Department of Behavioral Science, U of Kentucky; T. Marcum, Human Development Institute, U of Kentucky; L.C. Mullis, Human Development Institute, U of Kentucky; A. Nugent, Human Development Institute, U of Kentucky

**Abstract:** Women with disabilities experience cancer almost twice as much as women without disabilities. This is especially important in Kentucky, a state with one of the highest national rates of disability among women (35.4%). Early breast and cervical cancer detection increase survival rates and positive health outcomes; however, disabled women are less likely than non-disabled women to receive screenings. This may be due to exclusionary barriers that prevent women's access to care. The purpose of this study was to identify barriers to breast and cervical cancer screening access that women with disabilities experience and compare them to participants without disabilities. Adults with (n=120) and without (n=64) disabilities completed a universally designed assessment related to 1) knowledge about cancer screenings; 2) cancer screening beliefs; and 3) negative feelings related to screenings. Disability was measured using the American Community Survey's set of 6 disability questions & a self-identification question. Chi-Square tests of independence compared Likert Scale responses between participants with "Any Disability" and "No Disability" and between the 6 disability categories. Participants with disabilities were less likely to be aware of recommended screening frequency ( $\chi^2=9.65$ ,  $p=0.047$ ), less likely to believe they were at risk for getting breast or cervical cancer ( $\chi^2=20.13$ ,  $p=0.001$ ), and more likely to be hesitant to receive cancer screening tests due to fear or anxiety ( $\chi^2=11.23$ ,  $p=0.047$ ), safety concerns ( $\chi^2=13.68$ ,  $p=0.018$ ), or prior traumatic experience ( $\chi^2=11.08$ ,  $p=0.05$ ). Results highlight the need for collaborations between researchers, health professionals, and disability community members that inform education and trainings on these topics.

Supported by: This work was supported by the Kentucky Women's Cancer Screening Program [grant number 6 NU58DP006272], which is sponsored by the Centers for Disease Control and Prevention, National Breast and Cervical Early Detection Program.  
Sean Regnier's time on this project is supported by NIDA (K99DA060267; PI: Regnier)

Primary Presenter / email: **Regnier, Sean** / sean.regnier@uky.edu  
**Postdoctoral Scholar/Fellow**  
**Health Equity Research**  
**Cancer**

Presentation **37**

Abstract Title: **Factors Associated with Non-Compliance Rates in Human Papillomavirus Otolaryngology Population.**

Author(s): John Vieth, College of Medicine, U of Kentucky; Anthony Mangino, Department of Biostatistics, U of Kentucky; Joseph Valentino, Department of Otolaryngology, U of Kentucky.

**Abstract:** Educational Objective: To evaluate factors associated with appointment non-compliance rates and the effects of treatment delays in patients with HPV-related oropharyngeal squamous cell carcinoma (HPV-OPSCC). Objectives: Data obtained included whether each patient completed, no-showed, or cancelled appointments, tumor stage, treatment modality, insurance type, and treatment timeframe in relation to the COVID-19 pandemic as defined by WHO's definition of a Public Health Emergency of International Concern (PHEIC). Additional demographics including age, sex, race, ethnicity, and smoker status were evaluated.

Study Design: Retrospective review of academic tertiary referral center.

Methods: All patients 18 years of age or older with positive p16 HPV-OPSCC who scheduled an appointment at a tertiary otolaryngology clinic between January 1, 2013, and April 1, 2023.

Results: Across 36,579 encounters in 334 p16 positive patients, the no-show rate was 4.556% (n = 1,627) with a cancellation rate of 31.028% (n = 11,081). African American/Black patients were more likely than whites (p = 0.007), and those of Spanish origin more likely than non-Spanish (p < 0.001) to no-show. Males (p = 0.025), younger patients (p < 0.001), and those who have ever smoked (p = 0.009) were more likely to no-show. Base of the tongue HPV-OPSCC patients had lower non-compliance compared to other topographies (p < 0.001).

Conclusions: Non-compliance impacts treatment effectiveness and outcome quality for patients as well as burdening medical systems providing care. Future investigation should further assess barriers to appointment compliance and to develop methods aimed at addressing problems experienced by this increasingly prevalent patient population.

Supported by: NIH CTSA grant (UL1TR001998)

Primary Presenter / email: **Vieth, John** / jmvi227@uky.edu  
**Professional Student (MD, PharmD, Dentistry, PT)**  
**Basic Research**  
**Cancer**



Presentation **38**

Abstract Title: **Filtration or perspiration? RAAS may also alter transport processes in eccrine sweat glands**

Author(s): Kelsey A. Bullens & Thad E. Wilson; Department of Physiology & Saha Cardiovascular Research Center, University of Kentucky College of Medicine, Lexington, KY

**Abstract:** It is well-known how the systemic renin-angiotensin-aldosterone system (RAAS) regulates fluid and electrolyte balance via cardiovascular and renal modifications. Thermoregulatory eccrine sweating can also alter whole-body fluid and electrolyte balance. To investigate how alterations in RAAS may impact eccrine sweat glands, RT-qPCR was performed on kidney tissue from WT mice only and excised tails (no sweat glands) and paws (contain eccrine sweat glands) from WT mice (n = 20) and mice with subcutaneous osmotic pumps (n=6) to continuously deliver angiotensin II (ang II) (1,000 ng/kg/min for 4 weeks). Genes targets include the ang II type 1 receptor (AGT1R), ENaC, mineralocorticoid receptor (MR), and Na<sup>+</sup>/K<sup>+</sup>-ATPase. We hypothesized that gene targets would increase expression with systemic RAAS as induced by ang II infusion in paws but not tails due to paws containing eccrine sweat glands. One-way ANOVAs reveal increased gene expression in paws of ang II infusion mice in AGT1R (P<0.0001), MR (P<0.0001), and Na<sup>+</sup>/K<sup>+</sup>-ATPase (P<0.0001) vs paws of WT mice. Additionally, ang II infusion mice had greater gene expression of paws in targets AGT1R (P=0.0016), MR (P=0.0152) and Na<sup>+</sup>/K<sup>+</sup>-ATPase (P<0.0001) vs ang II infusion mice tails. Within WT mice, only AGT1R showed differences in expression between kidney tissue and paws (P = 0.0046) and kidney tissue and tails (P = 0.0147). No gene expression differences were found in any target between paws and tails in WT mice. In summary, RAAS genes expression of AGT1R, MR, and Na<sup>+</sup>/K<sup>+</sup>-ATPase in mice paws escalated with chronic systemic ang II infusion.

Supported by: TL1TR001997

Primary Presenter / email: **Bullens, Kelsey** / k.bullens@uky.edu  
**Graduate Student**  
**Translational Research/Science**  
**Cardiovascular**

Presentation **39**

Abstract Title: **Hypertriglyceridemia Promotes Aortic Aneurysm Formation and Rupture in Angiotensin II Infused Mice**

Author(s): L. Cai, CVRC and Department of Physiology, U of Kentucky; D. Howatt, CVRC and Department of Physiology, U of Kentucky; Q.L. Wu, Diagnostics Research and Development, Labcorp; M. A. Connelly, Diagnostics Research and Development, Labcorp; I. J. Goldberg, Division of Endocrinology, Diabetes and Metabolism, Department of Medicine, New York University; A. Daugherty, H.S. Lu and R. Temel, Saha Cardiovascular Research Center, Saha Aortic Center, and Department of Physiology, U of Kentucky

**Abstract:** Our group discovered that hypercholesterolemia augments angiotensin II-induced abdominal aortic aneurysm (AAA) in mice. Recently, it was reported that hypertriglyceridemia (HTG) caused by inducible lipoprotein lipase deficiency (iLpl<sup>-/-</sup>) results in uptake and accumulation of TRL lipid in aortic endothelial cells in vivo. Thereby, we hypothesized that HTG stimulates AAA formation.

**Methods:** Adult male and female Lplf/f.beta-actin-Mer/Cre/Mer 1/0 and Lplf/f mice were administered 75 mg/kg/day tamoxifen for 5 consecutive days. Mice were fed either a standard diet (SD) throughout the study or a Western-type diet (WD) starting 1 wk after the completion of tamoxifen administration and continuing for a total of 5 wks. Mini osmotic pumps were implanted in mice 2 wks after completion of tamoxifen administration and delivered saline or AngII at 1,000 ng/kg/min for 4 wks.

**Results:** AngII infused and SD fed iLpl<sup>-/-</sup> versus Lplf/f mice had elevated plasma TG and TC levels but similar abdominal aortic external diameter and AAA incidence. Plasma TG and TC were increased in female iLpl<sup>-/-</sup> versus Lplf/f mice with WD. However, plasma lipid concentrations could not be measured in male iLpl<sup>-/-</sup> because 10 of 11 animals had died from aortic rupture. In contrast, none of the male Lplf/f mice died and only 4 of 11 had abdominal aortic dilation. Female compared to male iLpl<sup>-/-</sup> mice were protected from AngII-induced aortic rupture (1/11 died) and only 1 of 9 females had abdominal aortic dilation. To eliminate the possibility that HTG alone caused aortic rupture in male mice, the study was repeated with the addition of saline infusion. In agreement with the first study, AngII plus WD lead to death by aortic rupture in all male iLpl<sup>-/-</sup> mice (9/9). In contrast, iLpl<sup>-/-</sup> male mice infused with saline had markedly greater survival (1/5 died).

**Conclusions:** HTG causes aortic aneurysm development in AngII-infused male iLpl<sup>-/-</sup> mice. Thus, treating HTG could reduce AAA risk.

Supported by: This research was supported by UL1TR001998 (RET, HSL) and R35HL155649 (AD)

Primary Presenter / email: **Cai, Lei** / LCAI8@UKY.EDU  
**Staff**  
**Basic Research**  
**Cardiovascular**

Presentation **40**

Abstract Title: **Delayed Cardiotoxicity Following 5-FU: A Case of Reaction Years After Treatment**

Author(s): E. Hall, Department of Internal Medicine, U of KY; A. Arbune, Department of Cardiovascular Disease, U of KY

**Abstract:** 5-Fluorouracil is a common chemotherapeutic agent used as therapy for various gastrointestinal, breast, and ovarian cancers. While side effects are most commonly gastrointestinal, neurotoxicity and cardiotoxicity are potential and more severe consequences of administration. Reported cardiac sequelae range from coronary vasospasm to myocarditis, with symptoms often occurring shortly after initial administration. This case presents a patient who uniquely tolerated 5-FU exposure for 2 years before presenting with concern for reaction.

The patient, an 82-year-old male with medical history notable for severe aortic stenosis and CAD with CABG 14 years prior and PCI 8 years prior; diagnosed with appendiceal adenocarcinoma. Patient received right neoadjuvant seven cycles FOLFOX and Bevacizumab administration followed by eleven cycles FOLFIRI + FUDR. He then presents to the emergency department with acute chest pain and troponin elevation. Coronary angiogram was suspicious for vasospasm secondary to 5-FU. Chemotherapy was held in setting of upcoming TAVR, and patient was managed medically with low-dose isosorbide mononitrate and diltiazem.

Given unclear guidelines regarding rechallenge of 5-FU, the decision to resume therapy required careful consideration. The patient did relatively well following TAVR, and resumption of 5-FU trialed as bolus, and was well-tolerated in setting of nitrates and beta-blockade. However, given disease progression, he was transitioned to BRAF therapy. The case brings into question the suspected mechanism of 5-FU toxicity, given the delay and tolerance on retrial. Knowledge of such case may contribute to both understanding of 5-FU toxicity mechanism as well as alter surveillance and follow-up of patients who tolerate therapy initially.

Supported by:

Primary Presenter / email: **Hall, Evan** / [evan.hall@uky.edu](mailto:evan.hall@uky.edu)  
**Medical Resident/Fellow**  
**Clinical Research**  
**Cardiovascular**

Presentation **41**

Abstract Title: **Tissue Hypoxia and Multiple Organ Impairments in a Rat Model of Diabetes-Associated Amylin Dyshomeostasis**

Author(s): L. Herndon, U of Kentucky; N. Verma, Department of Pharmacology and Nutritional Sciences, U of Kentucky; S. Despa, Department of Pharmacology and Nutritional Sciences, U of Kentucky; F. Despa, Department of Pharmacology and Nutritional Sciences, U of Kentucky

**Abstract:** Capillary function and oxygen-carrying capacity of red blood cells (RBCs) decline in type-2 diabetes exacerbating the risk of hypoxia and organ malfunction. Amylin, a  $\beta$ -cell hormone co-secreted with insulin, participates in normal glucose regulation. Accumulating data from several laboratories have confirmed that, in addition to pancreatic islets, the hearts, kidneys and brains of patients with type-2 diabetes contain also abnormally increased levels of aggregated amylin. Our hypothesis is that the interplay between insulin resistance and hyperamylinemia results in toxic accumulation of aggregated amylin in the microvasculature that adversely affects function of multiple organs, including, but not limited to, the heart. Here, we used rats overexpressing human amylin in the pancreas (HIP rats) to test whether a "human" hyperamylinemia predisposes to tissue hypoxia. Wild-type (WT) littermates expressing non-amyloidogenic rat amylin served as control. Hearts of HIP rats showed amylin deposition in capillaries, intravascular macrophage accumulation, microhemorrhages and loss of vascular endothelial cell coverage and tight junctions. These changes were associated with diastolic dysfunction, cardiac hypertrophy and mid-range cardiac ejection fraction (~50). Abundant amylin deposition was detected in HIP rat red blood cells (RBCs). Amylin-loaded RBCs have altered deformability and increased adherence to cultured endothelial cells. Intravenous infusion of RBCs from HIP rats in WT rats resulted in release of amylin in plasma and capillaries, attachment of RBCs to the vascular endothelium, intravascular macrophage accumulation and microhemorrhages. In conclusion, prediabetes-induced amylin dyshomeostasis impairs capillary function and oxygen-carrying capacity of RBCs; amylin-loaded RBCs can initiate pathological processes that are involved in pathological aging.

Supported by: NIH RO1 grant

Primary Presenter / email: **Herndon, Lexie** / lahe239@uky.edu  
**Undergraduate Student**  
**Translational Research/Science**  
**Cardiovascular**

Presentation **42**

Abstract Title: **RAD Deletion Increases Exercise Through Mitochondrial Function**

Author(s): Sarisha Lohano, Kyle Barker, Garrett Elmore, Andrea Sebastian, Bryana Levitan, Alec Dupont, Jonathan Satin; Department of Physiology, Gill Heart and Vascular Institute, University of Kentucky

**Abstract:** Background: RAD regulates calcium current through the Cav1.2 channel. Cardiomyocyte-restricted deletion of RAD (cRADKO) improves calcium channel activity and systolic function in healthy mice, but its impact on voluntary exercise and cardiac-extracardiac communication is unexplored. Endurance exercise induces eccentric hypertrophic remodeling, increasing capillary and mitochondrial density.

Hypothesis: cRADKO will pre-adapt the heart to exercise. Exercise will rescue mice with dilated cardiomyopathy (DCM).

Methods: We tested cRADKO in exercising mice with heart failure (DCM) and healthy mice. Echocardiography data was collected at the start and end of the running period. Cardiac tissue was analyzed for mitochondrial function and cell size. Soleus, gastrocnemius, and plantaris muscles were examined for fiber type composition.

Results: No significant differences in voluntary exercise activity were observed between healthy WT and cRADKO mice. cRADKO mice had elevated EF at baseline. cRADKO prevented changes in EF or chamber dimensions. LV thickness increased in cRADKO compared to WT. No structural or functional changes occurred with exercise.

MLPKO cRADKO ran more than MLPKO. There is a trend for increased mitochondrial respiration with cRADKO. There is also a trend for increased mitochondrial respiration with exercise in the MLPKO cRADKO.

Future Directions and Expected Results

Healthy WT and cRADKO indistinguishable total exercise eliminate differential exercise as a variable, thus permitting evaluation of gene knockout effect. To assess cRADKO effect on physiological hypertrophic signaling I will be measuring candidate signaling intermediaries. Healthy WT mice recapitulated human athletes' heart, and cRADKO pre-adapted the heart to exercise.

Supported by: DoD PR22074, NIH HL166280, and AHA 24IAUST1198317

Primary Presenter / email: **Lohano, Sarisha** / sslo226@uky.edu  
**Undergraduate Student**  
**Translational Research/Science**  
**Cardiovascular**

Presentation **43**

Abstract Title: **Stent Grafts for Symptomatic Thoracic Central Venous Occlusions in Patients with Arteriovenous Access**

Author(s): A. T. Tran, University of Kentucky College of Medicine, M. J. Lemke, University of Kentucky College of Medicine, P. P. Oo, Department of Internal Medicine, University of Kentucky, K. R. Heier, Department of Biostatistics, University of Kentucky, K. J. Mcquerry, Department of Biostatistics, University of Kentucky, S. S. Alagusundaramoorthy, Department of Internal Medicine, University of Kentucky

**Abstract:** Background: Thoracic central venous obstruction (TCVO) are common in dialysis patients. Several treatment options have been published in literature including usage of bare metal stents, stent grafts (SG) and large diameter stent grafts with variable long-term patency. The length of self-expanding stent grafts causing contra-lateral central venous obstruction remains a concern during deployment. We describe our single center experience of self expanding (Viabahn) as well as balloon expandable stent grafts (Viabahn VBX) in patients with symptomatic central stenoses based on TCVO classification. The foreshortening of these stents with maximal expansion allows for precise deployment in central veins at site of occlusion without encroachment. Patients who underwent SG placement for symptomatic TCVO were included in the analysis.

Methods: Continuous variables were summarized using medians [Q1, Q3], and categorical variables were summarized using counts and percentages. All statistical tests were two-sided and statistical significance was defined as p-value  $\leq 0.05$ . We conducted a survival analysis on the time to first re-intervention with the primary exposure being TCVO as well as stent type. Time to event was defined as the time between index date (first surgery date) and the date of the first re-intervention.

Results: 32 patients had 34 stent grafts deployed during the study period Oct 2020-Oct 2024. Stent grafts are successful in maintaining AV access patency as well as providing symptom relief in symptomatic TCVO. Long term patency of balloon expandable stent grafts remained excellent for TCVO types 2, 4 without a need for repeated interventions. Patients who received a combination of Viabahn/Vbx remained highest risk of re-intervention.

Conclusion: Stent grafts (balloon expandable/self expanding) are safe and efficacious in preserving AV access. The use of Stent grafts in TCVO type 1 needs to be studied further due to increased number of re-intervention.

Supported by:

Primary Presenter / email: **Tran, Alex** / [attr227@uky.edu](mailto:attr227@uky.edu)  
**Professional Student (MD, PharmD, Dentistry, PT)**  
**Clinical Research**  
**Cardiovascular**

Presentation **44**

Abstract Title: **Exogenous estradiol does not regulate daily metabolic rhythms underlying diet-induced obesity in male mice**

Author(s): Oliver Voeking, W. Brad Osborne, Oluwabukola B. Omotola, and Julie S. Pendergast,  
Department of Biology, University of Kentucky, Lexington, Kentucky, USA

**Abstract:** High-fat diet (HFD) disrupts the daily rhythms of eating in male mice and causes obesity. In contrast, circulating estrogens in female mice protect their eating rhythms from disruption by HFD feeding. This study aims to determine if exogenous estradiol protects eating rhythms from disruption in male mice. We studied C57BL/6J male mice that were implanted with Silastic tubing containing either estradiol or sesame oil. The mice were housed individually in light-tight boxes in a 12h light:12h dark cycle and fed 10% kcal low-fat diet for 7 days and then 45% kcal HFD for 14 days. Eating behavior was recorded continuously with infrared cameras. Food intake and body weight were measured weekly. No significant changes in body weight, adiposity, and fasting blood glucose were detected. HFD feeding similarly decreased the amplitudes of the daily eating behavior rhythms in males treated with estradiol and oil. These results indicate that exogenous estradiol does not protect the daily eating rhythm from disruption by HFD feeding in male mice, in contrast to females. Taken together these data suggest that the neural circuit that regulates eating rhythms is sexually differentiated during development such that only females respond to estradiol in adulthood.

Supported by: This study was funded by National Institutes of Health grants NIH Award R01DK124774, P30GM127211 and Diabetes Research Center at Washington St. Louis P30DK020579, NSF CAREER IOS-2045267, and the University of Kentucky. The content is solely the responsibility of the authors and does not necessarily represent the official views of the NIH.

Primary Presenter / email: **Voeking, Oliver** / oliver.voeking@uky.edu  
**Staff**  
**Basic Research**  
**Circadian Rhythm**

Presentation **45**

Abstract Title: **Impact of antiplatelet therapy on diabetic retinopathy onset and progression**

Author(s): Sarah Draud, University of Kentucky College of Medicine; Qingjun Wang (PhD), Department of Ophthalmology and Visual Sciences, University of Kentucky; Michelle Abou-Jaoude (MD), Department of Ophthalmology and Visual Sciences, University of Kentucky; Tony Mangino (PhD), Department of Biostatistics at the University of Kentucky College of Public Health; Susan Westneat (MA), Department of Epidemiology and Environmental Health University of Kentucky College of Public Health

**Abstract:** Diabetic retinopathy (DR) is a significant complication of diabetes mellitus (DM), characterized by damage to the retinal blood vessels. It is a leading cause of vision loss among working-age adults globally, making it a critical public health issue. DR is influenced by factors such as chronic hyperglycemia, inflammation, and vascular dysfunction. Platelets, which play a key role in blood hemostasis, are hyperactive in DM due to chronic hyperglycemia, contributing to complications like DR. Hyperactive platelets promote microvascular occlusions, endothelial dysfunction, and inflammation, all of which are involved in DR pathogenesis. However, the exact mechanisms by which platelet hyperactivity contributes to DR remain poorly understood. Additionally, the effects of suppressing platelet activation on DR progression are understudied. This study aims to address these gaps by retrospectively reviewing patient records from the University of Kentucky between June 5, 2021, and August 20, 2024. We will examine the onset and progression of DR in patients with and without antiplatelet medication usage. Specifically, we will analyze changes in DR diagnosis and progression between the first and second documented eye exams, using diagnostic codes and imaging results, while correlating antiplatelet medication usage with DR outcomes. Data abstracting for this study is currently ongoing, with the aim to further explore the relationship between platelet activation and DR development. This research may provide insights into the role of platelet activation in DR and inform potential therapeutic strategies for preventing or managing the disease.

Supported by: PSMRF NIH CTSA grant (UL1TR001998)  
National Institute of Health grant (5R01HL160910-02) to QJW

Primary Presenter / email: **Draud, Sarah** / sedr230@uky.edu  
**Professional Student (MD, PharmD, Dentistry, PT)**  
**Clinical Research**  
**Diabetes**



Presentation **46**

Abstract Title: **Quorum Sensing Inhibition: A Novel Strategy to Combat Non-Typhoidal Salmonella**

Author(s): A. Kabir, Department of Veterinary Science, U. of Kentucky; B. Lamichhane, Department of Veterinary Science, U. of Kentucky; K. A. Shaaban, Department of Pharmaceutical Sciences, U. of Kentucky; L. V. Ponomareva, Department of Pharmaceutical Sciences, U. of Kentucky; J. S. Thorson, Department of Pharmaceutical Sciences, U. of Kentucky; Y. A. Helmy, Department of Veterinary Science, U. of Kentucky

**Abstract:** Salmonella is a major foodborne pathogen leading to several chronic diseases including irritable bowel syndrome, chronic bacteremia & endocarditis, gallbladder carriage, chronic fatigue syndrome, and neurological complications. Quorum sensing (QS) is a cell-to-cell communication which allows the bacteria to sense its population density and regulate its virulence inside host. This communication is conducted by signaling molecules called autoinducers 2 (AI-2). This study is aimed to identify QS inhibitors and evaluate their effect on virulence and biofilm formation of Salmonella in vitro. Total 1,900 small molecules (SMs) were tested to assess their impact on QS/AI-2 production. Bacterial cultures (100 $\mu$ L; OD=0.05) were treated with 1 $\mu$ L of each small molecule (SM; 10 $\mu$ M - 0.7 $\mu$ M) in 96 well plates followed by incubation for 6 hours at 30 °C to assess their effect on bacterial growth. SMs demonstrating no significant impact on bacterial growth were subsequently selected for bioluminescence assay. Cell-free supernatants of treated bacteria were incubated with *Vibrio harveyi* BB170 to evaluate their effect on AI-2 production. SMs exhibiting the highest inhibitory activity for AI-2 were then selected for their effect on biofilm formation and the expression of virulence associated genes using RT-PCR. Ten SMs with more than 95% inhibition of AI-2 activity without affecting bacterial growth were selected for further evaluation. These compounds possessed inhibition (95-100%) of biofilm formation. Furthermore, all 10 compounds downregulated the expression of genes associated with quorum sensing, virulence, biofilm development, and motility. Quorum sensing inhibitors offer a promising new strategy to combat Salmonella infections.

Supported by: This research is supported by the Center of Biomedical Research Excellence for Translational Chemical Biology (COBRE, NIH P20 GM130456).

Primary Presenter / email: **Kabir, Ajan** / ajan.kabir@uky.edu  
**Graduate Student**  
**Translational Research/Science**  
**Drug Development**

Presentation **47**

Abstract Title: **OleD Loki as a catalyst for Glycosylation of Heterocycles and Sterically-Constrained Acceptors**

Author(s): M. R. U. Karim, L. V. Ponomareva, A. Shrestha, K. A. Shaaban, J. S. Thorson  
COBRE for Translational Chemical Biology and Department of Pharmaceutical Sciences, College of Pharmacy, University of Kentucky

**Abstract:** Glycorandomization is a robust platform to enable differential glycosylation of a wide range of complex small molecules and natural products, including drug leads and approved drugs. This technique expands pharmacophore chemical diversity and, in many cases, improves solubility and pharmacokinetics. In the present study, we explored the capabilities of the engineered OleD Loki glycosyltransferase in the context of heterocycles and drugs/leads bearing aromatic-, primary-, secondary- and tertiary-hydroxyls. Representative newly identified heterocyclic OleD Loki substrates from this study included indoles, thiopyrimidines, thiopurines, benzoxazoles, pyridopyrimidine, and imidazopyridines. Loki regio-/stereoselectivity with corresponding substrates was determined via scaled chemoenzymatic production and structure elucidation. Importantly, this study highlights the ability to form novel S-, N-, and O-glycosides and to surprisingly glycosylate sterically constrained acceptor nucleophiles. As first step toward exploiting glycosylation as a potential prodrug strategy, the solubility and plasma stability of representative glycosides were also evaluated.

Supported by: NIH award: COBRE for Translational Chemical Biology (CTCB, NIH P20 GM130456) and the National Center for Advancing Translational Sciences (UL1 TR001998).

Primary Presenter / email: **Karim, Rokon UI** / mka317@uky.edu  
**Postdoctoral Scholar/Fellow**  
**Basic Research**  
**Drug Development**

Presentation **48**

Abstract Title: **Next-generation probiotics for Campylobacter control: A novel antibiotic-alternative approach**

Author(s): B. Lamichhane, Department of Veterinary Science, U of Kentucky; I. Messaoudi, Department of Microbiology, Immunology and Molecular Genetics, U of Kentucky; Y. A. Helmy, Department of Veterinary Science, U of Kentucky

**Abstract:** Campylobacter jejuni is the major cause of foodborne gastroenteritis worldwide. Humans are infected by the consumption of contaminated poultry and poultry products. Antibiotics serve as the mainstay treatment for C. jejuni infections in humans and animals. The emergence of antibiotic resistant C. jejuni underscores the urgency to develop alternative therapeutics. We aim to develop next-generation probiotics (NGPs) as antibiotic alternatives to control C. jejuni infections. We screened 38 different probiotic strains for their effect on the growth of C. jejuni using an agar-well diffusion assay. All the probiotics demonstrated growth inhibition of C. jejuni. The top 7 probiotics were selected for further evaluation. All 7 candidates significantly inhibited C. jejuni's growth when co-cultured in broth media. Similarly, cell-free supernatants of all 7 candidates had up to 100% inhibition of biofilm formation and pre-formed biofilms of C. jejuni. In addition, the pre-treatment of human intestinal cells (Ht-29 MTX cells) with the selected candidates significantly ( $p < 0.05$ ) inhibited the adhesion, invasion, and intra-cellular survivability of C. jejuni in the cells. All the selected candidates downregulated the expression of genes associated with virulence, motility, and biofilm formation. They also inhibited the growth of other strains of Campylobacter such as C. fetus, C. lari, C. hyointestinalis, and C. coli. Our future studies will focus on understanding how NGPs modulate their action on intestinal and assess their effects in vivo. Our results will facilitate the development of NGPs as alternatives to antibiotics for controlling C. jejuni infections.

Keywords: C. jejuni, foodborne, antibiotic resistance, next-generation probiotics, alternatives

Supported by: National Center for Advancing Translational Sciences, National Institutes of Health (grants number KL2TR001996 and UL1TR001998)

Primary Presenter / email: **Lamichhane, Bibek** / bibek.lamichhane@uky.edu  
**Graduate Student**  
**Translational Research/Science**  
**Drug Development**

Presentation **49**

Abstract Title: **A Vision for the Future: Early Intervention in Title I Schools**

Author(s): M. A. Edwards, Center for Professional and Community Health Education, University of Kentucky College of Medicine; H. Ahmad, Center for Professional and Community Health Education, University of Kentucky College of Medicine; G. A. Riedmatter, Center for Professional and Community Health Education, University of Kentucky College of Medicine

**Abstract:** Background: Early career exposure shapes students' aspirations and educational trajectories, yet students in Title I schools, particularly in underserved communities, often lack mentorship and career exploration opportunities. Vision is a community engagement initiative that addresses intersectionality by introducing students to professional pathways through hands-on activities and multidisciplinary mentorship.

Objective: This project aims to expose students in Title I schools in Lexington, Kentucky to diverse career opportunities by integrating experiential learning with professionals in medicine, law, pharmacy, dentistry, and public health. Through interactive sessions, we seek to inspire students, increase accessibility to potential career paths, and empower them to envision a future profession they may not have otherwise considered.

Methods: The team engineers engaging, age-appropriate activities that are implemented in school settings. Allowing students to explore real-world applications of various disciplines, such as surgical knot tying, courtroom trials, and epidemiological modeling effectively emphasizes mentorship and skill-building to foster long-term academic motivation.

Impact: Between December 2023 through November 2024, Vision has reached 200 students with nine teachers actively participating. The program enlisted 37 volunteers from diverse academic backgrounds across seven different interdisciplinary colleges, reinforcing Vision's collaborative approach and broad academic representation. Ongoing data collection through surveys and follow-up discussions will provide insight into the longitudinal influence of the program.

Conclusion: Vision offers a novel approach to career exposure in underserved communities, leveraging interdisciplinary collaboration to inspire the next generation. By fostering early interest in diverse fields, this initiative can enhance educational and professional outcomes for students.

Supported by: Center for Interprofessional and Community Health Education

Primary Presenter / email: **Edwards, Madison** / mase228@uky.edu  
**Professional Student (MD, PharmD, Dentistry, PT)**  
**Community Research**  
**Education**

Presentation **50**

Abstract Title: **A Cornerstone of the Primary Care Scholarly Concentration: The Primary Care Health Inequities and Delivery Course**

Author(s): C.L. Elam, Department of Behavioral Science, U of Kentucky; A.R. Hoellein, Department of Internal Medicine, U of Kentucky; S.A. Haist, Department of Internal Medicine and the Office of Medical Education, U of Kentucky

**Abstract:** Physician supply lags patient demand in Kentucky where it is expected that an additional 640 primary care physicians (PCPs) must be added to the Commonwealth's workforce by 2030. Funding from HRSA enabled the University of Kentucky College of Medicine to launch a multifaceted approach to address our primary care shortage through 1) tailored outreach and exposure programs for secondary school students, 2) pre-matriculation programming for accepted medical students, and 3) a Primary Care Scholarly Concentration for selected UKCOM students.

Health care access and health inequities limit opportunities for optimal health. Through active learning experiences, the Primary Care Health Inequities and Delivery course explores the social determinants of health (SDOH) and how systemic factors impact access. This second-year elective, first offered in Fall 2024, meets two hours each week. Approaches to instruction are varied including presentations by medical specialists, shadowing in a free clinic, workshop training addressing physician bias and cultural humility, standardized patient training emphasizing SDOHs, a trip to a regional community hospital producing rural PCPs, and a panel of legislative and policy leaders discussing advocacy and access. Student learning is facilitated through readings, reflective essays and student presentations.

Students completed pre-course Qualtrics surveys regarding expectations and attitudes toward inequities, and health policy, and ACEs. They journaled general impressions of the utility and interest generated by class activities. Preliminary evaluation data suggests that students completing the elective thought course content reinforced the importance of PCPs in facilitating early and comprehensive care. End of course evaluations will be summarized for the conference.

A variety of speakers, a range of instructional methods, and group interactions engaged students in considering strategies to address health access and outcomes.

Supported by: HRSA grant: Value Based Medical Student Education Training Program (T99HP52106)

Primary Presenter / email: **Elam, Carol** / carol.elam@uky.edu  
**Faculty**  
**Scholarship of Teaching & Learning**  
**Education**

Presentation **51**

Abstract Title: **TEK Faculty Fellows: Building Faculty Capacity for Teaching Durable Skills through Transdisciplinary Collaboration**

Author(s): S. Felkins, Center for the Enhancement of Learning and Teaching, U of Kentucky; M. Aulisio Miller, Center for the Enhancement of Learning and Teaching, U of Kentucky; T. Conatser, Center for the Enhancement of Learning and Teaching, U of Kentucky

**Abstract:** Faculty bring deep disciplinary expertise to their teaching, and their courses already provide students with opportunities to develop essential skills like collaboration, problem-solving, and leadership. However, making these skills more visible and intentionally supporting their development requires new ways of thinking about teaching and learning across disciplines. The TEK Faculty Fellows program creates a transdisciplinary faculty learning community where faculty collaborate to examine how durable skills emerge in their courses and how they can be more deliberately integrated.

Rather than treating durable skills as add-ons, TEK Faculty Fellows work across disciplines to surface the ways their students are already engaging in skill development and to design strategies that make those moments more visible and intentional. This collaborative approach allows faculty to draw on their own disciplinary expertise while co-creating instructional strategies that extend beyond any single field. This work not only strengthens individual teaching practices but also builds a broader institutional culture of transdisciplinary collaboration, reinforcing the connections between what students learn in different courses and how those skills translate beyond the classroom.

This poster highlights the TEK Faculty Fellows model as a transdisciplinary learning community, showcasing how structured, collaborative faculty development creates space for innovation, strengthens interdisciplinary connections, and enhances student preparation for complex, real-world challenges. By designing faculty learning communities that mirror the transdisciplinary work we ask of students, TEK provides a model for rethinking both faculty development and student learning in higher education.

Supported by:

Primary Presenter / email: **Felkins, Shawna** / shawna.felkins@uky.edu  
**Staff**  
**Scholarship of Teaching & Learning**  
**Education**

Presentation **52**

Abstract Title: **Implementing a Health Literacy Curriculum for Refugee and Immigrant Students in a Cincinnati Public High School**

Author(s): A. Khan, College of Medicine, U of Kentucky; A. Elzarka, Refuge Collaborative, Cincinnati, OH; S. Doshi, Refuge Collaborative, Cincinnati, OH; M. Ismail, Refuge Collaborative, Cincinnati, OH

**Abstract:** Background: Health literacy is essential for navigating the healthcare system, yet many refugee and immigrant students face significant barriers in accessing and understanding health information. This project aimed to implement and evaluate an eight-week health literacy curriculum designed to empower refugee and immigrant high school students with the knowledge and skills to make informed health decisions.

Methods: An eight-module health literacy curriculum was facilitated to 10 students and covered topics including nutrition, substance use, preventive care, mental health, prescriptions, health insurance, and ethics. The curriculum's impact on health literacy was measured using field notes and a pre-post survey design.

Results: Field notes indicated that students reported increased engagement with the inclusion of translated content and interactive activities. However, the language barrier remained a challenge, as students in the same classroom had varying English proficiency levels and spoke multiple languages, making it difficult to discuss complex topics effectively. Post-intervention results will be available in March.

Conclusion: Refugee and immigrant high school students have limited health literacy, but demonstrate a strong willingness to learn. Addressing language barriers through translated content and interactive activities can improve engagement, though varying English proficiency levels within the same classroom present ongoing challenges to comprehension.

Supported by: Advancing Refugee Led Mental Health and Well-Being Restricted Fund (Cincinnati Compass)

Primary Presenter / email: **Khan, Areeba** / akh258@uky.edu  
**Professional Student (MD, PharmD, Dentistry, PT)**  
**Health Equity Research**  
**Education**

Presentation **53**

Abstract Title: **Undetectable Bicarbonate in a Well-Appearing Patient**

Author(s): V. Subramaniam, U of Kentucky College of Medicine; S. Hall, B. Blankenship, A. Micciche, P. Akpunonu, Department of Emergency Medicine, U of Kentucky

**Abstract:** Background: We present a unique case of erroneous undetectable bicarbonate on a comprehensive metabolic panel (CMP) in a patient who was stable for discharge from the emergency department (ED) due to elevated triglycerides.

Case Presentation: 28-year-old male with Type 2 diabetes mellitus (DM) presenting for hyperglycemia. Upon further workup the patient was diagnosed with hypertriglyceridemia after bicarbonate values on venous blood gas and the metabolic panel showed vastly different results. The patient ultimately remained stable through two consecutive visits to our ED and was discharged on a lipid-lowering agent and increased metformin dose.

Conclusion: Hypertriglyceridemia may alter lab values on blood gas panels and metabolic panels. Despite the rarity, the mechanism by which this phenomenon occurs is essential for providers to understand how lab values could be affected by various components of the blood sample. This should be considered when assessing the accuracy of lab values that seem inappropriate within the clinical context of the patient.

Supported by:

Primary Presenter / email: **Subramaniam, Vaaragie / vsu226@uky.edu**  
**Professional Student (MD, PharmD, Dentistry, PT)**  
**Case report**  
**Endocrine**



Presentation **54**

Abstract Title: **A Case of Neurocysticercosis in Emergency Department**

Author(s): V. Subramaniam, U of Kentucky College of Medicine; S. Hall, Department of Emergency Medicine, U of Kentucky; J. Houck, Department of Emergency Medicine, U of Kentucky

**Abstract:** Background: Neurocysticercosis is caused by the helminth, *Taenia Solium*, acquired from ingesting undercooked pork and can cause devastating neurologic manifestations. We present a rare case of a patient who immigrated from Nepal presenting to the emergency department with seizures and was diagnosed with neurocysticercosis.

Case presentation: 26 year-old female presented to the ED after experiencing 4-5 generalized tonic-clonic seizures at home. She was post-ictal when she arrived in the ED and went on to have another seizure. Due to concerns for status epilepticus, she was loaded with 4g of Keppra. Upon further workup, the CT scan showed abnormal calcification of the occipital lobe. MRI showed a ring enhancing lesion in the right occipital lobe with punctuate calcification which is a stereotypical finding in neurocysticercosis, known as the scolex. She received IV dexamethasone, Keppra, and albendazole.

Conclusion: Neurocysticercosis is rare diagnosis in the United States with estimates of 0.2 to 0.6 cases per 100,000 of the general population according to the NIH. However, it is important to be aware of the symptoms of neurocysticercosis especially since there is an increasing number of immigrant populations who are at higher risk of exposure to the helminth. When undiagnosed and untreated, neurocysticercosis is the leading cause of acquired epilepsy in developing countries and can cause seizures (as seen this patient) as well as increased intracranial pressure and can be fatal in rare circumstances.

Supported by:

Primary Presenter / email: **Subramaniam, Vaaragie** / vsu226@uky.edu  
**Medical Student**  
**Case report**  
**Infectious Disease**

Presentation **55**

Abstract Title: **Phenotypic and Genotypic Characterization of Antimicrobial Resistance of Salmonella Infections in Cattle.**

Author(s): Nada A. Fahmy 1, Ajran Kabir 1, Erdal Erol 2, Yosra A. Helmy 1\*  
1. Department of Veterinary Science, Martin-Gatton College of Agriculture, Food, and Environment, University of Kentucky, Lexington, Kentucky, USA.  
2. Veterinary Diagnostic Laboratory, Martin-Gatton College of Agriculture, Food, and Environment, University of Kentucky, Lexington, Kentucky, USA.

**Abstract:** Non-typhoidal Salmonella is one of the leading causes of foodborne illness in the world. It is transmitted through the consumption of contaminated food and water. Salmonella infections are commonly treated using antibiotics. However, the overuse and misuse of antibiotics has led to the development of antimicrobial resistance (AMR) in Salmonella. This study aims to identify and characterize the virulence and antimicrobial resistance profiles of Salmonella isolates from necrotized cattle. Out of 1,008 tissue samples collected, 23 isolates were identified as Salmonella-positive using MALDI-TOF, and their presence was further confirmed by PCR targeting the *invA* gene. Out of 23 isolates, Salmonella Dublin was found to be the most common stereotype (34.8%). Similarly, virulence genes such as *sopB*, *spvC* and *hliA* were detected in 94.7%, 86.96% and 82.6% of isolates respectively. The highest resistance percentages were observed to tetracycline and chloramphenicol (100%), followed by to azithromycin, imipenem, marbofloxacin (95.65%), and piperacillin/tazobactam (69.6%). Furthermore, these isolates produced biofilm at different levels of intensity, classified as strong (47.8 %), moderate (39.1%) and weak biofilm producers (13.04%). In addition, 78.3% (n=18) of the isolates demonstrated high swarming motility and 95.65% (n=22) exhibited swimming motility. This study highlights the prevalence of antimicrobial resistance (AMR) and virulence-associated genes in Salmonella enterica isolates obtained from necropsied cattle. These findings underscore the need for continuous surveillance, improved antimicrobial stewardship, and the development of alternative therapeutic strategies to mitigate the impact of AMR in zoonotic pathogens like Salmonella.

Supported by: This research is supported by Center for Pharmaceutical Research and Innovation (CPRI, NIH P20 GM130456) & University of Kentucky (VPR) Igniting Research Collaborations progr

Primary Presenter / email: **Abdelkader, Nada** / Nada.adel@uky.edu  
**Graduate Student**  
**Translational**  
**Infectious Disease**

Presentation **56**

Abstract Title: **Treatment Outcomes in Deep-Seated *Stenotrophomonas maltophilia* Infections: Monotherapy versus Combination Therapy**

Author(s): H. Curry, Department of Pharmacy Services, UK HealthCare; D. Casaus, Department of Pharmacy Services, UK HealthCare; K. Lucas, Department of Translational and Clinical Science, U of Kentucky College of Pharmacy; A.J. Kunz Coyne, Department of Translational and Clinical Science, U of Kentucky College of Pharmacy

**Abstract:** Background: Optimal treatment for *S. maltophilia* remains unclear due to inconsistent findings from limited studies with small sample sizes, selection bias, and potential misclassification of colonization as infection. Methods: This retrospective study evaluated patients with deep-seated, monomicrobial *S. maltophilia* infections treated with at least one in-vitro active antimicrobial within 72 hours of culture collection. Exclusions included patient who died or entered hospice within 48 hours of admission. The primary outcome was clinical failure, defined as a 30-day composite of mortality, readmission, or recurrent infection. Secondary outcomes were analyzed as the individual components of the composite outcome. Regression models with inverse probability of treatment weighting (IPTW) identified predictors of the composite outcome.

Results: Of the 190 patients included, 52.1% received monotherapy and 47.9% received combination therapy. Infection sites included deep abscesses (63.2%), bone and joint (33.7%), and infective endocarditis (3.2%). Hospital acquired infections were significantly more frequent in the monotherapy group than combination group (59.6% vs 44.0%,  $p=0.031$ ). Clinical failure occurred in 30.3% and 34.1% of patients receiving monotherapy and combination therapy, respectively ( $p=0.579$ ). Multivariable weighted models identified SOFA score as an independent predictor associated with increased composite outcome (aOR, 1.17; 95% CI, 1.02–1.33;  $p<0.001$ ), while receipt of combination therapy with levofloxacin (LVX) plus trimethoprim/sulfamethoxazole (TMP/SMZ) was protective (aOR, 0.24; 95% CI, 0.10–0.55;  $p<0.001$ ).

Conclusion: Combination therapy with LVX and TMP/SMX demonstrated protective effects against clinical failure in patients treated within 72 hours of culture collection. Higher SOFA scores were associated with worse infection-related outcomes, emphasizing the importance of illness severity in guiding treatment strategies.

Supported by:

Primary Presenter / email: **Curry, Hunter** / hunter.curry@uky.edu  
**Other**  
**Clinical Research**  
**Infectious Disease**

Presentation **57**

Abstract Title: **Salmonella in Companion Animals as a Public Health Threat Due to Multidrug Resistance**

Author(s): G. M. Faisal; A. Kabir; B. Lamichhane; R. Rios; T. Habib; Y. A. Helmy; Department of Veterinary Science, Martin-Gatton College of Agriculture, Food and Environment, University of Kentucky, Lexington, KY

**Abstract:** Companion animals can be asymptomatic carriers of Salmonella, a zoonotic pathogen that poses public health risks. Subclinical infections in dogs and cats lead to fecal shedding, increasing the risk of human exposure through direct contact or environmental contamination. This study aimed to determine the prevalence, virulence characteristics, and antimicrobial resistance (AMR) profiles of Salmonella isolates from healthy dogs and cats in Central Kentucky, emphasizing their potential impact on public health. Fecal samples (n=206) were collected from cats (n=66) and dogs (n=140) at veterinary clinics and animal shelters. Samples were enriched, plated on XLT4 agar, and Salmonella was confirmed by PCR targeting the invA gene. Swarming and swimming motility were assessed, and biofilm formation was evaluated using the crystal violet assay. Virulence and AMR genes were detected via PCR, and antimicrobial susceptibility testing was performed using the broth microdilution method against 11 antibiotics. Salmonella was detected in 11.6% (24/206) of samples, with 87.5% forming strong biofilms. High swarming and swimming motility were observed in 45.8% and 58.3% of isolates, respectively. Common virulence genes included invA (100%), hilA (83.3%), and siiA (87.5%). AMR genes such as blaTEM (70.8%), blaCTX (79.1%), strA (66.7%), and sul2 (70.8%) were prevalent. All isolates exhibited multidrug resistance, with macrolides and trimethoprim-sulfamethoxazole showing the highest resistance. Silent Salmonella shedding in pets highlights the need for proper hygiene, pet handling awareness, and veterinary surveillance to reduce zoonotic transmission risks.

Supported by: This research is supported by Center for Pharmaceutical Research and Innovation (CPRI, NIH P20 GM130456) and University of Kentucky (VPR) Igniting Research Collaborations program.

Primary Presenter / email: **Faisal, Golam Mahbub** / gm.faisal@uky.edu  
**Graduate Student**  
**Translational Research/Science**  
**Infectious Disease**

Presentation **58**

Abstract Title: **Evaluating Infectious Disease Specialist Involvement on Gram Negative Bacteremia Outcomes**

Author(s): E. Oliver, Acute Care Pharmacy Services, UK Healthcare; D. Burgess, Department of Pharmacy Practice & Science, U of Kentucky

**Abstract:** Purpose: Gram-negative bloodstream infections (GN-BSI) are a significant cause of morbidity and mortality, particularly in ICU patients. While infectious diseases (ID) consultations improve outcomes in gram-positive BSIs, their impact on GN-BSIs remains less defined.

Methods: This single-center, retrospective study analyzed monomicrobial GN-BSIs in pediatric and adult patients admitted to UK HealthCare from September 2023 to October 2024. Data were extracted from electronic health records and UK Center for Clinical and Translational Science (CCTS). The primary outcome was 30-day mortality. Secondary outcomes included microbiological data, antimicrobial therapy, demographics, Charlson Comorbidity Index (CCI), and qPitt bacteremia scores. Statistical analysis included univariate and multivariate tests ( $p < 0.05$ ).

Results: Of 1,208 gram-negative blood cultures identified, 616 cases were analyzed. The cohort was 56.7% male, with a mean (SD) age of 56.1 (20.5). The majority of infections were community-acquired (69.6%). The in-hospital mortality rate was 14.3%, with ICU mortality significantly higher than ward mortality (24.4% vs. 5.7%,  $p < 0.001$ ).

The top pathogens were *E. coli* (39.9%), *K. pneumoniae* (16.2%), and *P. aeruginosa* (9.9%). The only resistance mechanism detected via ePlex was CTX-M in 45 isolates. ICU admission ( $p < 0.001$ ), hospital-acquired infection ( $p = 0.002$ ), qPitt ( $p < 0.001$ ), and CCI ( $p < 0.001$ ) were associated with mortality. ID consultations were more frequent in non-ICU patients (52.1% vs. 39.2%,  $p = 0.012$ ). Median (IQR) length of stay was 11 (3,24) days.

Conclusions: ICU admission, hospital-acquired infection, and disease severity were associated with higher mortality. Further analysis is needed to assess the impact of ID consultations on outcomes.

Supported by:

Primary Presenter / email: **Oliver, Emily** / emily.oliver@uky.edu  
**Professional Student (MD, PharmD, Dentistry, PT)**  
**Clinical Research**  
**Infectious Disease**

Presentation **59**

Abstract Title: **Piloting a Novel Community-Engaged Surveillance System to Improve Harm Reduction Services for People Who Inject Drugs**

Author(s): H.L. Surratt, A.L. Burton, S.L. Walsh, Department of Behavioral Science, U of Kentucky; K. McLaurin, Department of Pharmaceutical Sciences, U of Kentucky; J.H. Gulley, Clark County Health Department; A.L. Smith, J. Wang, Department of Statistics, U of Kentucky; Chris Delcher, Department of Pharmacy Practice and Science, U of Kentucky; Robert Heimer, Yale University; and Svetla Slavova, Department of Biostatistics, U of Kentucky.

**Abstract:** Kentucky is a high priority Ending the HIV Epidemic state, with high rates of new HIV diagnoses tied to injection drug use. The goal of this pilot is to launch sentinel surveillance of bloodborne infections and drug compounds among people who inject drugs (PWID) to inform rapid community response. In collaboration with the Clark County, KY, syringe services program (SSP), the pilot involves two 1-month waves of data collection: enrolling eligible SSP participants and conducting anonymous behavioral surveys, collection of participants' syringes, laboratory testing of syringes for HIV and Hepatitis C (HCV), drug residue testing through National Institute of Standards and Technology, and modeling approaches to produce outputs of infection and drug detection. Collaboration with community stakeholders will identify optimal messaging for reporting results. The first wave community-facing pilot was conducted in Fall 2024. 29 survey responses were obtained. Primary drugs of injection reported via survey in the prior month were: methamphetamine (62.1%), heroin (13.8%), fentanyl (13.8%), buprenorphine (10.3%), meth and fentanyl in combination (3.4%). PWID reported returning 900 used syringes; a median of 15 per participant visit. To date, 126 syringes have been tested for drug compounds; HIV and HCV detection testing methods are in development. Results will be presented. Early results document proof of concept for our sentinel surveillance study; all individuals screened were willing to participate in surveys and syringe collection. New methods to identify risk for disease outbreaks and emerging drugs can inform rapid allocation of prevention resources at a community level.

Supported by: Pilot funding from the UK CCTS.

Primary Presenter / email: **Surratt, Hilary** / hilary.surratt@uky.edu  
**Faculty**  
**Community Research**  
**Infectious Disease**

Presentation **60**

Abstract Title: **Short-Term ULLS and Sleep Restriction Reduce Voluntary Strength and Firing Rate of MUs During Isometric Knee Extension**

Author(s): 1,2Jordan Hughes, 1,2Masafumi Uchiyama, 1E Elmore, 1J McArdle, 1S Nithyanandam, 3J Caruso, 1SA Best, and 1,2LM Bollinger ; 1Dept. of Kinesiology and Health Promotion, University of Kentucky; 3Dept. of Health & Sport Sciences, University of Louisville; 2Center for Muscle Biology, University of Kentucky

**Abstract:** Background: Muscle disuse and sleep restriction (SR) independently impair strength, in part, through reduced motor unit recruitment, yet, their interactive effects remain unexplored. Methods: Healthy subjects (7F, 4M, 1TGM age: 20-44y) underwent 13d unilateral lower limb suspension (ULLS) using forearm crutches and shoes modified with a 5cm stack. Subjects were randomized to sleep adequate (SA; 21:00-06:00) or SR (01:00-06:00) for the final three nights. Bilateral isometric knee extension at 90% MVIC was performed before and after ULLS using visual torque biofeedback. Four-pin surface EMG array sensors (Delsys Galileo) were used to determine individual motor unit action potential trains. Linear mixed model analysis (SPSS) compared MVIC and firing rates for low- (0.05), moderate- (0.15), and high-amplitude (0.25mV) motor units. Results: A sleep x limb x time interaction was noted for MVIC ( $p=0.004$ ). MVIC was approximately 6.6% lesser in the right limb in the SR group, but not in the SA group. Conversely, MVIC of the left leg was lesser in both the SA (11.8%) and SR (16.8%) groups post-ULLS. A significant sleep x limb x time interaction was noted for firing rate of low ( $p=0.012$ ), but not moderate or high ( $p=0.098$  and  $0.025$ ) amplitude motor units. Firing rates for low amplitude motor units was similar in the right leg of the SA group pre- and post-intervention ( $22.6 \pm 4.4$  v.  $21.8 \pm 4.6$  pps). In the SR group, firing rate of low-amplitude motor units was reduced approximately 20% post-intervention ( $13.0 \pm 4.0$  v.  $10.5 \pm 4.0$  pps). In the left leg, firing rate of low-amplitude motor units was reduced by 30% in both the SA ( $21.9 \pm 4.3$  v.  $14.8 \pm 4.5$  pps) and SR ( $12.3 \pm 4.3$  v.  $8.7 \pm 4.0$  pps) post-ULLS. Conclusion: ULLS and SR additively reduce voluntary strength and firing rate of low, but not moderate- or high-amplitude motor units.

Supported by: Kentucky NASA; RFP-21-001

Primary Presenter / email: **Hughes, Jordan** / [jordanhughes@uky.edu](mailto:jordanhughes@uky.edu)  
**Graduate Student**  
**Basic Research**  
**Muscle**

Presentation **61**

Abstract Title: **FOXO1-Driven Myonuclear Pathology in Chronic Kidney Disease Persists After Kidney Transplantation**

Author(s): A. R. Keeble, CMB, UKY, S. Gonzalez-Velez, CMB, UKY, J. Z. Goh, CMB, UKY, H. C. Weiss, CMB, UKY, J. L. King, CMB, UKY, N. T. Thomas, CMB, UKY, A. M. Owen, CMB, UKY, C. S. Fry, CMB, UKY, W. Paredes, DM, AECM, S. Duran, DM, AECM, K. Zhang, DM, AECM, M. K. Abramowitz, DM, AECM

**Abstract:** Frailty in patients with Chronic Kidney Disease (CKD) greatly exacerbates disease comorbidities and increases probability of death. Prior work suggests molecular alterations in skeletal muscle physiology underly frailty and poor intervention response in this patient population. These deficits in skeletal muscle contractile and metabolic function persist after dialysis treatment and predict poor outcomes following kidney transplantation. Even with successful transplant, frailty persistence is variable and hinders recovery. This study aims to identify molecular drivers of muscle pathology in patients with late-stage CKD before and after kidney transplantation. Single-nucleus RNA-sequencing (sn-RNAseq) was conducted on skeletal muscle biopsies from healthy participants(4), late-stage CKD(6) patients, and patients post-transplant(4). Sequencing output files were analyzed using Seurat v5. Primary myogenic progenitor cells (MPCs) were isolated and myogenic capacity was assessed via myotube differentiation assays. Muscle fiber size and type were analyzed immunohistochemically on biopsy sections.

sn-RNAseq revealed upregulation of the metabolic regulator FOXO1 in myonuclei from CKD patients, both pre- and post-transplant. This was coupled with increased PDK4 expression, and these transcriptomic changes correlated with a switch from oxidative to glycolytic myofibers in CKD patients, which was exacerbated post-transplant. Moreover, MPCs isolated from CKD patients exhibited attenuated myogenesis, driven by FOXO1. Our findings implicate FOXO1 as a central driver of skeletal muscle pathology in CKD, which persists despite kidney transplantation. The observed metabolic inflexibility may be compounded by the use of calcineurin inhibitors as post-transplant immunosuppressants. Targeting FOXO1 and exploring alternative immunosuppressive agents could restore metabolic flexibility, promote muscle recovery, and improve patient outcomes.

Supported by: This work was supported by National Institutes of Health grant numbers R01AR077042 (M.K.A, C.S.F.) and the Irma T. Hirsch/Monique Weill-Caulier Trust (M.K.A.).

Primary Presenter / email: **Keeble, Alex / arke243@uky.edu**  
**Graduate Student**  
**Translational Research/Science**  
**Muscle**



Presentation **62**

Abstract Title: **Evaluating Mitochondrial Bioenergetics of Skeletal Muscle in Sepsis Survivors following Spinal Cord Injury**

Author(s): J. Patel\*, K. Iyer\*, K. Zamiar, D. Patel, T. Garg, Spinal Cord and Brain Injury Research Center and Department of Physiology, U of Kentucky;  
S. Rippey, H. Saito, Departments of Surgery and Physiology, U of Kentucky;  
T. Butterfield, Athletic Training and Clinical Nutrition, U of Kentucky;  
S. P. Patel, Spinal Cord and Brain Injury Research Center and Department of Physiology, U of Kentucky

**Abstract:** Spinal cord injury (SCI) results in profound neuromuscular impairments, including skeletal muscle atrophy and metabolic dysfunction, which may be exacerbated by sepsis. A critical factor in this pathology is mitochondrial dysfunction, manifesting as impaired oxidative phosphorylation (OXPHOS), elevated reactive oxygen species (ROS) production, and disrupted energy metabolism. While mitochondrial deficits following SCI are well-documented, the impact of sepsis on muscle bioenergetics remains poorly understood. Injury severity and sepsis-related inflammation may differentially affect neuromuscular function, particularly in oxidative slow-twitch soleus and mixed-fiber plantaris muscles, leading to distinct bioenergetic responses and exacerbated muscle dysfunction.

To investigate this, contusion SCI was induced at L1/L2 using an Infinite Horizon (IH) Impactor with varying severities—Mild (200 kdyn), Moderate (250 kdyn), and Severe (250 kdyn + 3s dwell). Sepsis was induced via intraperitoneal injection of cecal slurry (3 ml). Mitochondrial respiration was assessed four weeks post-injury with/without sepsis using Oroboros high-resolution respirometry.

Results revealed a significant decline in mitochondrial respiration in both soleus and plantaris muscles post-SCI. The soleus exhibited a severity-dependent decline, whereas the plantaris showed pronounced deficits only in the severe SCI group. Ongoing studies are investigating muscle bioenergetics in SCI+Sepsis along with molecular and histomorphological changes to uncover underlying mechanisms.

Supported by: This project was supported by funding from the National Institutes of Health (NIH), including grant 1R21NS128749-01A1 (SP/HS) from the National Institute of Neurological Disorders and Stroke (NINDS) and grant P20 GM148326 from the National Institute of General Medical Sciences (NIGMS), U.S. Department of Health and Human Services.

Primary Presenter / email: **Patel, Jaydeepbhai** / jaydeepbhai.patel@uky.edu  
**Postdoctoral Scholar/Fellow**  
**Basic Research**  
**Muscle**

Presentation **63**

Abstract Title: **Porcine ACL Transection Injury Induces Clinically-Relevant Deficits in Quadriceps Quality and Fiber Size**

Author(s): Heather N. Thompson, Biomedical Engineering, Center for Muscle Biology, U of Kentucky; Nicholas T. Thomas, Athletic Training and Clinical Nutrition, Center for Muscle Biology, U of Kentucky; Lily Del Valle, Saleh Al Jundi, Andrew Castro, Benedikt L. Proffen, Department of Orthopedics, Harvard University; Jillian E. Beveridge, Department of Orthopedics, Rhode Island Hospital/Brown University, Providence, RI; Christopher S. Fry, Center for Muscle Biology, U of Kentucky

**Abstract:** Anterior cruciate ligament (ACL) injuries cause acute deficits in lower limb strength and function and contribute to long-term knee osteoarthritis. The cellular mechanisms behind quadriceps atrophy and weakness post-ACL injury remain unclear. Although direct muscle biopsies provide insights, they are invasive and impractical for widespread clinical use. There is a need for pre-clinical models to better understand quadriceps dysfunction following ACL injury. Large animal models, such as pigs, offer anatomical and biomechanical similarities to humans, but the impact of ACL injury on porcine quadriceps muscle alterations is not well defined. This study aimed to assess cellular changes in porcine quadriceps following ACL transection (ACLT). We hypothesized that the porcine model would exhibit similar quadriceps atrophy and muscle quality deficits as seen in humans. Yucatan minipigs underwent unilateral ACLT, and vastus lateralis muscle samples were harvested 8 weeks later. Histological analysis showed significant reductions in muscle fiber cross-sectional area (CSA) in the ACLT limb compared to the non-injured limb, with atrophy values similar to human ACL injury (15-25%). Fiber type distribution remained similar between ACLT and non-injured limbs. Collagen staining revealed increased collagen content in the ACLT limb, consistent with human findings. These results validate the porcine model for studying quadriceps dysfunction after ACL injury and provide a foundation for testing therapeutic interventions. The model highlights the persistent nature of quadriceps deficits post-ACL reconstruction, emphasizing the need for novel treatment approaches.

Supported by: NIH NIAMS R01 AR072061, and the Boston Children's Hospital Orthopedic Surgery and Sports Medicine Foundation

Primary Presenter / email: **Thompson, Heather** / [hnth226@uky.edu](mailto:hnth226@uky.edu)  
**Graduate Student**  
**Basic Research**  
**Muscle**

Presentation **64**

Abstract Title: **Glucose Dysregulation Leads to Development of Malignant Cerebral Edema Following Thrombectomy in Acute Ischemic Stroke**

Author(s): H. Ahmad, UK College of Medicine, Department of Neurosurgery, U of Kentucky; N. Meredith, UK College of Medicine, Department of Neurosurgery, U of Kentucky; J. Frank, UK College of Medicine, Department of Neurosurgery, U of Kentucky; N. Millson, UK College of Medicine, Department of Neurosurgery, U of Kentucky; A. Trout, UK College of Medicine, Department of Neurosurgery, U of Kentucky; L. Bauerle, UK College of Medicine, Department of Neurosurgery, U of Kentucky; H. Choi, UK College of Medicine

**Abstract:** Introduction: Malignant cerebral edema (MCE) is a complication following ischemic stroke. While risk factors have been identified, the role of glucose dysregulation remains unclear. This study examines the relationship between glucose levels and MCE development in thrombectomy patients. Methods: Utilizing the Blood And Clot Thrombectomy Registry And Collaboration (BACTRAC) tissue bank, we identified patients who developed MCE, requiring decompressive hemicraniectomy or resulting in death, following thrombectomy for ischemic stroke. MCE was defined as radiologic evidence of significant cerebral edema or need for decompressive hemicraniectomy. During thrombectomy, intra-arterial samples were collected systemically and intracranially. Demographics, comorbidities, stroke labs, and 184 systemic and intracranial protein levels were analyzed. Categorical variables were assessed using Fisher's Exact Test, continuous variables with Mann-Whitney U tests, and proteomics with independent samples t-tests (False Discovery Rate  $\geq 20.0\%$ ). Results: Following mechanical thrombectomy, 23 patients (191 total) developed MCE (12%). MCE patients had significantly higher mean admission A1c levels ( $7.17 \pm 2.50$  vs.  $6.32 \pm 2.27$ ,  $p = 0.024$ ), POC glucose (BG) levels ( $170.7 \pm 87.3$  vs.  $132.0 \pm 54.6$ ,  $p = 0.004$ ), and Type 2 Diabetes Mellitus (T2DM) prevalence (56.5% vs. 33.5%,  $p = 0.039$ ), compared to patients that did not develop MCE. No significant differences were observed in age ( $63.0 \pm 13.8$  vs.  $67.2 \pm 15.1$ ), sex (52.2% vs. 57.1% female), or proteomic data ( $p > 0.05$ ). Conclusion: Elevated BG levels, mean A1c levels, and T2DM prevalence were associated with increased rates of DHC and malignant cerebral edema following acute ischemic stroke. These factors could guide predictive algorithms for early identification of patients needing surgical decompression.

Supported by: CCTS AI in Medicine Award

Primary Presenter / email: **Ahmad, Haseeb** / hah223@uky.edu  
**Professional Student (MD, PharmD, Dentistry, PT)**  
**Clinical Research**  
**Neurology**

Presentation **65**

Abstract Title: **Expression of Dementia Biomarkers in Appalachian and Non-Appalachian ELVO Patients during Thrombectomy**

Author(s): N. Anil College of Medicine, U of Kentucky; K. R. Pennypacker, Department of Neurology, Neuroscience, and Center for Advanced Translational Stroke Science

**Abstract:** Vascular Cognitive Impairment and Dementia (VCID) affects 25-30% of stroke patients and includes cognitive impairments caused by vascular injury, such as post-stroke dementia. Rehabilitation has the potential to improve the quality of life for patients at risk of developing dementia. However, there is currently no reliable method to identify those at risk of dementia after a stroke. Several biomarkers, including AD/AD (Alzheimer's disease and related dementias) biomarkers (Amyloid beta, tau, NfL, and GFAP) and angiogenic factors (VEGF, Flt-1, Tie-2, PIGF, and FGF) have been associated with the development of dementia. Populations in Appalachia experience a higher incidence of stroke and related mortality compared to other groups. Given the elevated stroke rates in Appalachian communities, this study aims to investigate potential proteomic differences between patients from Appalachian and non-Appalachian counties. The primary goal of the study is to characterize the expression of post-stroke cognitive dementia biomarkers and to explore differences in the proteomic profiles of Appalachian and non-Appalachian populations.

Supported by: NINDS/NIA-R01NS127974; PSMRF: The project described was supported by the National Center for Advancing Translational Sciences, through Grant UL1TR001998; Sanders-Brown Center on Aging and the grant P30 AG072946

Primary Presenter / email: **Anil, Neha** / nehakanil@gmail.com  
**Professional Student (MD, PharmD, Dentistry, PT)**  
**Translational Research/Science**  
**Neurology**

Presentation **66**

Abstract Title: **Biobanking for Breakthroughs: Advancing Neurologic Disease Research Through the NeuroBank**

Author(s): E. Ghoneim, Neuroscience Research Priority Area, U of Kentucky; B. Broome, Neuroscience Research Priority Area, U of Kentucky; H. Stegemann, Department of Neurology, U of Kentucky; L. Muzinic, Neuroscience Research Priority Area, U of Kentucky; and Tritia Yamasaki, Neuroscience Research Priority Area, Department of Neurology, U of Kentucky

**Abstract:** The University of Kentucky NeuroBank was established in 2019 to support translational neuroscience research by collecting and biobanking high-quality biospecimens from patients with a wide range of neurologic conditions. The NeuroBank facilitates collaboration across departments at the University of Kentucky and external institutions, providing researchers with essential resources to advance understanding, biomarker discovery, and treatment development. Biospecimens, including blood, cerebrospinal fluid (CSF), and tissue, are collected from inpatient and outpatient settings at the UK Albert B. Chandler Hospital and the Kentucky Neuroscience Institute. Samples are processed and stored under standardized protocols to maximize research utility. Clinical data associated with samples are securely maintained and deidentified for researcher access. The NeuroBank has collected over 1,300 samples (22,500+ aliquots) from more than 1,000 participants, with a high consent rate of 94.8%. The collection encompasses a diverse range of neurologic disorders, including neurodegenerative diseases (e.g., ALS), movement disorders (e.g., Parkinson's), demyelinating diseases (e.g., MS), epilepsy, stroke, and traumatic brain injury. In total, the repository holds approximately 1,500 CSF samples, 360 brain tissue samples, and 21,000 aliquots from over 800 blood samples, supporting multiple ongoing studies. With a growing and diverse repository of biospecimens, the NeuroBank is uniquely positioned to accelerate discoveries in neurological disease research, providing investigators with critical resources to advance scientific knowledge and therapeutic innovations. By offering significant sample collections for conditions such as epilepsy or MS, NeuroBank plays a pivotal role in accelerating research in neurodegeneration and neuroinflammation. Ongoing expansion efforts ensure continued relevance and impact within the neuroscience community.

Supported by: UK Neuroscience Research Priority Area

Primary Presenter / email: **Ghoneim, Elaf** / ekgh224@uky.edu  
**Staff**  
**Translational Research/Science**  
**Neurology**

Presentation **67**

Abstract Title: **Intravital Imaging Techniques for Cerebrovascular Research**

Author(s): Rungruedee Kimseng, Sanders-Brown Center on Aging, U of Kentucky; Pradoldej Sompol,  
Department of Pharmacology and Nutritional Sciences, College of Medicine, U of Kentucky

**Abstract:** Classical histology and microscopy techniques of fixed brain tissues are commonly used for neuroscience research; however, functional study of cerebrovasculature and brain cells is unpractical. Developing functional imaging techniques at a single vessel and cellular levels to study cerebrovascular pathology especially in Alzheimer's disease and Alzheimer's disease related dementias (AD/ADRD) are essential. Here, we established intravital imaging protocols under multiphoton microscopy (MP) to study the interaction of brain cells and vasculature. Moreover, we use laser speckle contrast imaging (LSCI) technique to investigate superficial cerebral blood flow. These techniques are crucial research methodologies for investigating translational aspects of research.

Intravital imaging techniques are used to visualize and investigate fluorescent brain in transgenic animals or from AAV-mediated fluorescent protein expression in specific cell types such as neurons and astrocytes. Cranial window surgery and glass window installation on top of the AAV injected brain region (e.g. barrel cortex) were performed. After recovery, the animals were acclimated to an intravital multiphoton imaging platform. To visualize beta-amyloid in the brain, Methoxy-X04 was injected prior imaging. Cerebrovasculature was visualized by intravascular retro-orbital injection of rhodamine-dextran. This procedure was done while the animals were under anesthesia and securely head fixed. To study neurovascular coupling in awake mice, air-puff stimulation of contralateral whiskers was conducted while a target penetrating arteriole is recording under MP. Similarly, superficial blood flow change could be observed under LSCI. Increased vascular diameter and superficial blood flow responses after triggered as indicators of hyperemic neurovascular function.

Intravital imaging techniques are indispensable routine methods for translational neuroscience and cerebrovascular research application.

Supported by: R21AG074146-01A1, P01AG078116-01 6507, UL1 TR001998, UK-NRPA

Primary Presenter / email: **Kimseng, Rungruedee** / kim.rrd@uky.edu  
**Staff**  
**Translational Research/Science**  
**Neurology**

Presentation **68**

Abstract Title: **WMH Growth/Regression: A Sensitive Neuroimaging Biomarker for CAA**

Author(s): Michael T. Maisel, Department of Neuroscience, University of Kentucky; Ahmed A. Bahrani, Department of Neurology, University of Kentucky; David K. Power, Linda Van Eldik, Department of Neuroscience, University of Kentucky; and Larry Goldstein, Department of Neurology, University of Kentucky; Gregory A. Jicha, Department of Neurology, University of Kentucky

**Abstract:** Background: Cerebral amyloid angiopathy (CAA) is associated with cognitive impairment, dementia, lobar microbleeds, and increased white matter hyperintensities (WMH). Traditional WMH quantification methods, like volume subtraction, do not capture dynamic changes such as growth and regression. This study evaluates whether a novel WMH growth/regression pipeline can better differentiate CAA-positive (CAA+) from CAA-negative (CAA-) individuals.

Methods: Longitudinal 3D FLAIR and T1-weighted MRI scans (n=78) from the University of Kentucky were analyzed using the WMH growth/regression pipeline to compute WMH growth and regression volumes over one year. Participants were divided into CAA+ (n=29) and CAA- (n=49) groups based on Boston criteria. Statistical analyses assessed the ability of both the novel pipeline and traditional volume subtraction methods to differentiate between CAA+ and CAA- groups.

Results: WMH growth demonstrated a statistically significant difference between CAA+ and CAA- groups ( $p < 0.04$ ), while traditional volume subtraction showed no meaningful distinction ( $p = 0.067$ ). This suggests that the dynamic nature of WMH growth, rather than static volumetric differences, is more sensitive for differentiating between the groups.

Conclusion: The WMH growth/regression pipeline serves as a novel and sensitive neuroimaging biomarker for distinguishing CAA+ from CAA- groups, compared to traditional methods. This approach enhances the accuracy of CAA diagnosis and advances our understanding of cerebrovascular disease-related white matter pathology. Future research may apply this method to other neurodegenerative disorders and clinical trials as a reliable imaging biomarker.

Supported by: NINDS Award: R01NS116058

Primary Presenter / email: **Maisel, Tyler** / [mtje224@uky.edu](mailto:mtje224@uky.edu)  
**Graduate Student**  
**Clinical Research**  
**Neurology**

Presentation **69**

Abstract Title: **Metabolic-Associated Protein Differences in Total and Astrocyte Enriched Extracellular Vesicles During Stroke**

Author(s): C.Prince,Neurosurgery,U ofKentucky;J.Wilson,Neurosurgery,U ofKentucky;M. Walker,Neurosurgery,U ofKentucky;C.O'Dell,Neurosurgery,U of Kentucky;J.Frank,Neurosurgery,U ofKentucky;N.Millson,Neurosurgery,U of Kentucky;M.AI-Kawaz,Neurosurgery,U ofKentucky;S.Pahwa,Neurosurgery,U of Kentucky;J.Harp,Neurology,U ofKentucky;D.Dornbos III,Neurosurgery,U ofKentucky;K.Pennypacker,Neuroscience,U of Kentucky; A.M.Stowe,Neuroscience, U ofKentucky; J.F. Fraser,Neurosurgery,U of Kentucky;A.L.Trout,Neurosurgery,U ofKentucky

**Abstract:** Ischemic stroke treatments assist in restoring blood flow, but do not guarantee good outcomes. Key barriers to providing specialized therapies are a lack of biomarkers to understand brain specific cellular changes. Extracellular vesicles (EVs) are an understudied, yet highly relevant, source for biomarkers of neuroinjury. We hypothesize EVs-associated metabolic protein changes, during ischemic stroke, indicate cellular-specific changes that associate with outcomes. Blood And Clot Thrombectomy Registry And Collaboration" (BACTRAC; NCT03153683) is a human stroke biobank at the University of Kentucky that collects samples at the time of mechanical thrombectomy during emergent large vessel occlusions (ELVO; ischemic stroke). EVs were isolated, via size exclusion chromatography, from unbanked plasma and concentrated resulting in TEVs. Isolated protein was sent to Olink and ran on their metabolic panel. ELVO subjects (8 females/ 5 males) were an average age of  $71.1 \pm 11.7$  years. Lower TEV enolase 2, a neuronal glycolysis enzyme, associated with increased stroke severity (NIHSS;  $r_s = -0.7819$ ,  $p = 0.0476$ ). Higher systemically TEV quinoid dihydropteridine reductase (QDPR), essential co-factor enzyme, was associated with more severe strokes (NIHSS;  $r_s = 0.8486$ ,  $p = 0.0123$ ) and lower cognition (MoCA;  $r_2 = 0.7515$ ,  $p = 0.0254$ ). Interestingly, higher intracranial AEVs QDPR was associated with lower infarct volumes ( $r_s = -0.7333$ ,  $p = 0.0202$ ), less severe strokes (NIHSS;  $r_s = -0.6095$ ,  $p = 0.0388$ ) and better cognition (MoCA;  $r_2 = 0.6095$ ,  $p = 0.0388$ ). Increased AEV nicotinamide adenine dinucleotide kinase another essential co-factor enzyme, intracranially also correlated to higher cognition (MoCA;  $r_s = 0.8356$ ,  $p = 0.0298$ ). EV-associated cellular metabolic protein changes in glycolysis and essential co-factors associate with the progression of stroke outcomes and should be investigated further as target therapies during MT to improve outcomes.

Supported by: KL2 grant (KL2TR001996)

Primary Presenter / email: **Prince, Christiana** / [cmpr243@uky.edu](mailto:cmpr243@uky.edu)  
**Staff**  
**Translational Research/Science**  
**Neurology**



Presentation **70**

Abstract Title: **Amylin Dysregulation Exacerbates Behavioral Differences in Transgenic ApoE Mice**

Author(s): C. Conner, U of Kentucky; N. S. Leibold, Department of Pharmacology and Nutritional Sciences, U of Kentucky; V. G. Viswanathan, Department of Pharmacology and Nutritional Sciences, U of Kentucky; L. Radulescu, Department of Pharmacology and Nutritional Sciences, U of Kentucky; D. Kotiya, Department of Pharmacology and Nutritional Sciences, U of Kentucky; N. Verma, Department of Pharmacology and Nutritional Sciences; F. Despa, Department of Pharmacology and Nutritional Sciences, U of Kentucky

**Abstract:** Background: ApoE4 is the largest genetic risk factor for Alzheimer's disease (AD). Amylin, an amyloidogenic pancreatic peptide, forms oligomers with  $\beta$ -amyloid (A $\beta$ ) in AD. Previous studies have shown an effect of apoE genotype on neurocognitive performance when mice are humanized for both apoE and A $\beta$ . Here, we investigated whether mice humanized for amylin and apoE demonstrate apoE isoform-specific disturbances in behavior.

Methods: Mice humanized for apoE (E3 or E4) and amylin (apoE3HIP, and apoE4HIP, respectively) and amylin without apoE expression (EKO-HIP) were aged to six months before behavioral assessment and terminal organ collection. The novel object recognition (NOR) test was used to test recognition memory. The open-field test (OFT) was used to assess anxiety-like behaviors and ambulation.

Results: E4HIP mice demonstrated significantly impaired recognition memory compared to E3HIP littermates. A significant decrease in recognition memory was seen in EKO-HIP mice when compared to E3HIP mice. In the OFT, no statistically significant differences were observed between the groups in distance traveled, velocity, time spend in center zone, or frequency to center zone.

Conclusions: Our data suggest that the amylin-apoE molecular interaction may underlie apoE4-associated impairment. Interestingly, possession of apoE4 appears to be as detrimental to NOR performance as the absence of apoE. Further, when expressing human amylin, neither the possession of apoE4 nor the absence of apoE were associated with alterations in anxiety-like behavior or ambulatory performance when compared to E3 carriers. Future studies should explore whether disrupting the amylin-apoE interaction restores behavioral functioning in E4 carriers.

Supported by: National Institutes of Health R01 NS116058, R01 AG057290, and R01 AG053999

Primary Presenter / email: **Conner, Cate** / cateconner@uky.edu  
**Undergraduate Student**  
**Basic Research**  
**Neuroscience**

Presentation **71**

Abstract Title: **Differential Effect of  $\alpha$ -Synuclein on Mitochondrial Morphology in PD and MSA**

Author(s): O. Driskill, Neurology, U of Kentucky; J. Patel, Neurology, U of Kentucky; E. Ostrakhovitch, Neurology, U of Kentucky, Lexington Veteran's Medical Center; T. Yamasaki, Neurology, U of Kentucky, Lexington Veteran's Medical Center

**Abstract:** Parkinson's Disease (PD) and Multiple System Atrophy (MSA) are neurodegenerative movement disorders with the hallmark feature of pathologic aggregation of  $\alpha$ -Synuclein. There are known bioenergetic deficits in PD with Complex I inhibition in mitochondria in the brain. MSA has also been associated with electron transport chain dysfunction. We evaluated mitochondrial structure in  $\alpha$ -Synuclein-overexpressing HEK293 cells exposed to insoluble control, PD, and MSA brain fractions for 72 hours. Cells were fixed in glutaraldehyde for 5 minutes, embedded in EPON epoxy resin, sectioned, and mounted on formvar grids. Sections were incubated with conformation-specific primary antibodies targeting alpha-synuclein aggregates, washed, incubated again with the secondary antibody conjugated with colloidal gold, and stained with uranyl acetate. Sections were imaged on a Talos FEI F200X transmission electron microscope (TEM); this revealed a perturbation of the mitochondrial cristae, an increased number of swollen mitochondria, and an increased number of mitochondria with ruptured outer membranes in cells exposed to PD insoluble brain fractions. Immuno-gold staining revealed the accumulation of  $\alpha$ -Synuclein in mitochondria, nuclei, and cytoplasm. The  $\alpha$ -Synuclein in the mitochondria was observed in the periphery of the organelle. In MSA-exposed cells, mitochondrial structure was much less affected; however, mitochondria were elongated in comparison to tissue-exposed control mitochondria. The  $\alpha$ -Synuclein staining was also less prominent in MSA sections. Even so,  $\alpha$ -Synuclein was detected in mitochondria as well as in cytosol. Our findings suggest a prominent role for mitochondrial toxicity in PD. Changes in mitochondrial appearance in MSA exposed cells may suggest a deficiency in mitochondrial fusion/fission.

Supported by: INBRE Voucher through U of Louisville, NIH COBRE (1P20GM148326), VA CDA2 Grant IK2 (BX004883-01)

Primary Presenter / email: **Driskill, Olivia** / ogdr222@uky.edu  
**Undergraduate Student**  
**Clinical Research**  
**Neuroscience**

Presentation **72**

Abstract Title: **Optimizing Glyoxal as an Alternative Tissue Fixative to PFA**

Author(s): M. R. Hawkins, Spinal Cord and Brain Injury Research Center, U of Kentucky; T. Macheda, Spinal Cord and Brain Injury Research Center, U of Kentucky; K. N. Roberts, Spinal Cord and Brain Injury Research Center, U of Kentucky; H. Hash, Spinal Cord and Brain Injury Research Center, U of Kentucky; A. D. Bachstetter, Spinal Cord and Brain Injury Research Center, Department of Neuroscience, Sanders Brown Center on Aging, U of Kentucky

**Abstract:** Paraformaldehyde (PFA) is the standard tissue fixative for histological applications but poses significant health risks due to its toxicity and carcinogenic properties. Glyoxal, a small dialdehyde, has emerged as a potential alternative due to its lower toxicity and reported effectiveness in tissue fixation. Recent studies highlight glyoxal's advantages in immunohistochemical staining and tissue preservation. However, optimal fixation conditions for mouse brain tissue remain unclear. This study aims to determine the ideal glyoxal concentration and buffer composition for CNS tissue fixation. Mouse brain tissue was fixed using glyoxal at concentrations ranging from 3% to 50% to assess fixation efficacy. Ethanol was tested as a catalyst at concentrations of 1% to 10%. The diluent's pH and buffering system were optimized using sodium acetate, pH 4.0, and compared to other buffering conditions (e.g., water or PBS). Immunohistochemistry was performed to evaluate staining quality for microglia (IBA1), astrocytes (GFAP), leukocytes (CD45), and vasculature (CD31). Staining outcomes were compared with those obtained from PFA-fixed tissue. Autofluorescence levels and post-fixation incubation effects were also analyzed. Glyoxal fixation at 7% provided optimal tissue stability and immunostaining quality, surpassing the commonly used 3% concentration. Ethanol addition at 10% enhanced fixation efficacy, while sodium acetate buffer (pH 4.0) yielded superior tissue preservation and staining compared to water or PBS. Glyoxal-fixed tissue demonstrated improved vascular staining and reduced background staining relative to PFA-fixed tissue. Autofluorescence and post-fixation incubation effects differed significantly between glyoxal and PFA fixation. However, tissue fixed with glyoxal presented increased challenges in sectioning and mounting.

Supported by: SCoBIRC Endowment

Primary Presenter / email: **Hawkins, Margaret** / mran231@uky.edu  
**Faculty**  
**Clinical Research**  
**Neuroscience**

Presentation **73**

Abstract Title: **The Effects of FeTMPyP on Hippocampal Synaptic Function in 30-month-Old Mice**

Author(s): K Jinawong, Sanders–Brown Center on Aging, U of Kentucky; S.C. Roth, College of Agriculture, Food, and Environment U of Kentucky; R Kimseng, Sanders–Brown Center on Aging, U of Kentucky; P Sompol, Sanders–Brown Center on Aging, Departments of Pharmacology and Nutritional Sciences, U of Kentucky

**Abstract:** Background: The global population of superagers—individuals over the age of 80—is increasing, raising concerns about age-related neurodegeneration and cognitive decline. Oxidative stress is a key contributor to cognitive decline and brain in aging. FeTMPyP (FeT), a peroxynitrite scavenger with antioxidant properties, has shown potential in attenuating oxidative stress. We hypothesize that FeT may restore hippocampal synaptic function in super-aged mice, offering a potential therapeutic strategy for age-related cognitive decline. Methods: Middle aged and super-aged mice (30 months old) were assigned to vehicle or FeT treatment groups. FeT (10 mg/kg) was administered subcutaneously twice a week for 4 weeks. At the end of the treatment, brain slices were prepared for electrophysiological recordings to assess hippocampal synaptic function and dendritic spine analysis.

Results: Basal synaptic transmission in hippocampus was reduced in aged mice, as indicated by a lower EPSP slope, maximum EPSP slope, and EPSP/FV ratio. Hippocampal synaptic plasticity was investigated using high-frequency stimulation-induced long-term potentiation (LTP). Aged mice exhibited a decreased percent normalized fEPSP slope and percent increment in the fEPSP slope, which were slightly restored by FeT treatment.

Consistent with improvements in synaptic function, FeT significantly increased dendritic spine density in the CA1 and DG. Additionally, FeT enhanced the distribution of all spine types in CA1, while in the DG, only mushroom-type spines showed a significant increase compared to vehicle-treated mice.

Conclusion: FeT treatment enhanced hippocampal synaptic transmission and synaptic plasticity in super-aged mice, suggesting its potential as a therapeutic intervention for oxidative stress-related synaptic dysfunction in aging.

Supported by: (NIH)–National Institute on Aging Grants (AG074146), NIH Grant UL1TR001998 and University of Kentucky Neuroscience Research Priority Area to P.S.

Primary Presenter / email: **Jinawong, Kewarin** / [kji231@uky.edu](mailto:kji231@uky.edu)  
**Postdoctoral Scholar/Fellow**  
**Translational Research/Science**  
**Neuroscience**

Presentation **74**

Abstract Title: **The monoclonal antibody, 17E1, selectively labels glial fibrillary acid protein in 5xFAD mice**

Author(s): T. D. Nelson, Sanders Brown Center on Aging, U of Kentucky; S. D. Kraner, Sanders Brown Center on Aging, U of Kentucky; P. T. Nelson, Sanders Brown Center on Aging, U of Kentucky; and C. M. Norris, Sanders Brown Center on Aging, U of Kentucky

**Abstract:** Background: We developed a mouse monoclonal antibody, 17E1, that preferentially reacts with a subset of activated astrocytes. Preliminary data suggests that this antibody preferentially binds to an oxidized form of GFAP that is present at elevated levels in 5xFAD mouse brains. The goal of my project was to evaluate the expression of this oxidized form of GFAP quantitatively in wild type versus 5xFAD mouse, both males and females.

Results: Quantitative Westerns demonstrated that the 17E1 antigen was primarily expressed in 5xFAD brains and not wild type brains. Comparison of expression in males versus females showed that this protein was expressed at higher levels in 5xFAD females compared to males. DAB staining confirmed that the 17E1 antigen was expressed preferentially in 5xFAD brains, and showed that this protein was not expressed uniformly throughout the brain, but rather in a subset of astrocytes that were localized at higher levels in hippocampus. We are currently screening males versus females in DAB staining. To confirm that the 17E1 antigen is expressed in a subset of astrocytes, immunofluorescent staining was carried out with simultaneous labeling of 17E1, GFAP, and nuclear stain. These results confirmed that the 17E1 antigen was expressed in a subset of astrocytes.

Conclusion: The 17E1 antigen, which we believe to be an oxidized form of GFAP, is expressed in a subset of astrocytes in 5xFAD mice, with higher levels of expression in females than in males. We consider this oxidized form of GFAP to be a marker of "distressed" astrocytes.

Supported by: This work was supported by National Institutes of Health (NIH)– National Institute on Aging Grants AG027297 to C.M.N., P01AG078116 to C.M.N and P.T.N., P30AG072946 to P.T.N.

Primary Presenter / email: **Nelson, Tess** / tessnelsonn@gmail.com  
**High School Student**  
**Basic Research**  
**Neuroscience**

Presentation **75**

Abstract Title: **Relationships Between Blood and CSF Biomarkers in Alzheimer's Disease Risk**

Author(s): Mariena Passidomo, University of Kentucky; Maria Clark, University of Kentucky; Yuriko Katsumata, University of Kentucky; Xian Wu, University of Kentucky; Gregory A. Jicha, University of Kentucky; Tiffany L. Sudduth, University of Kentucky; Donna M. Wilcock, Indiana University; Christopher M. Norris, University of Kentucky; Yang Jiang, University of Kentucky

**Abstract:** Background: Leveraging blood-based biomarkers, we previously reported that astrocyte reactivity and interleukin biomarkers for vascular/AD link with brain thickness and volumes in the temporal cortex (Clark et al., 2024). However, whether plasma markers reflect brain-specific pathology or peripheral inflammation remains unclear. This study examines correlations between blood and cerebrospinal fluid (CSF) biomarkers to assess AD Risk.

Methods: Amyloid-beta (A $\beta$ ) plaques are abnormal protein deposits that accumulate outside neurons. We analyzed blood and CSF biomarkers from 27 older adults (mean age 76) in the Sanders-Brown Center on Aging, UK-ADRC cohort (25 cognitively normal, 2 with mild cognitive impairment). CSF was collected shortly after MRI, and correlations between peripheral and central levels of A $\beta$ 42 (plaques) and pTau181 (Neurofibrillary tangles) biomarkers were examined.

Results: Plasma A $\beta$ 42 strongly correlated with CSF A $\beta$ 42 ( $r=0.71$ ). Plasma and CSF pTau181 showed a weak correlation ( $r=0.2$ ). CSF A $\beta$ 42 negatively correlated with plasma pTau181 ( $r=-0.4$ ), which is consistent with the literature. The plasma A $\beta$ 42 showed a weak correlation with CSF pTau181 ( $r=0.18$ ).

Conclusions: These results show a significant positive correlation between blood-based and CSF A $\beta$ 42 concentrations, supporting plasma biomarkers' potential as an indicator for AD. The relationship between CSF A $\beta$ 42 and plasma pTau181 highlights that Amyloid accumulation may accelerate Tau pathology, and together they contribute to synaptic dysfunction, inflammation, and brain atrophy. The next step is to evaluate plasma and CSF biomarkers in relation to brain volume and brain activity.

Supported by:

Primary Presenter / email: **Passidomo, Mariena** / [mrpa250@uky.edu](mailto:mrpa250@uky.edu)  
**Undergraduate Student**  
**Clinical Research**  
**Neuroscience**

Presentation **76**

Abstract Title: **The Effects of FeTMPyP on Neurovascular Function in Aged Mice**

Author(s): S. Roth, College of Agriculture, Food, and Environment, U. of Kentucky;  
K. Jinawong, Sanders-Brown Center on Aging, U. of Kentucky; K. Rungruedee, Sanders-Brown  
Center on Aging, U. of Kentucky; G. Velmurugan, Spinal Cord and Brain Injury Research Center,  
Department of Neuroscience, U. of Kentucky; P. Sompol, Department of Pharmacology and  
Nutritional Sciences, Department of Neuroscience, U. of Kentucky

**Abstract:** Background: A growing aging population leads to an increased prevalence of age-related neurodegenerative diseases and a greater need for effective strategies to maintain cognitive and cerebrovascular health. Oxidative stress is one of the major contributors to aging and pathological processes including neurodegeneration. However, the characterization of antioxidants for preserving brain health in the aging population remains understudied.

Methods: Brain capillaries were isolated from young (6-month-old) and old (30-month-old) mice to compare vascular phenotypes using immunofluorescent staining. To study neurovascular function in aging mice, cranial window installation was performed, and the mice were randomly assigned to either vehicle or antioxidant, FeTMPyP treatment group, 10 mg/kg, subcutaneously, twice a week, for 4 weeks. Laser speckle contrast imaging (LSCI) through cranial window was used to study superficial cortical blood flow.

Results: A decline in the essential primary mitochondrial antioxidant enzyme, manganese superoxide dismutase (MnSOD), and the cerebral vessel tight junction protein (ZO-1) indicates a weakening of vascular integrity in the aging brain. Consistently, a reduced hyperemic response during whisker stimulation suggests a significant decline in neurovascular function with aging. Antioxidant, FeTMPyP treatment enhanced cerebral blood flow response during whisker stimulation in both young and old mice.

Conclusion: Aged mice exhibited decreased neurovascular integrity, while FeTMPyP treatment improved neurovascular function in both young and aged mice. These results suggest that FeTMPyP may have both preventative and therapeutic potential for enhancing neurovascular function, particularly in aging.

Supported by: NIH award: AG074146; NIH award: UL1TR001998; University of Kentucky Neuroscience Research Priority Area to P.S.

Primary Presenter / email: **Roth, Sophia** / sro340@uky.edu  
**Undergraduate Student**  
**Translational Research/Science**  
**Neuroscience**

Presentation **77**

Abstract Title: **Predicting Hemorrhagic Transformation Following Mechanical Thrombectomy with Extracellular Vesicle-Associated Proteins**

Author(s): M. Walker, Neurosurgery, U of Kentucky (UKY); C. Prince, Neurosurgery, UKY; C. O'Dell, Neurosurgery, UKY; J. Wilson, Neurosurgery, UKY; J. Frank, Neurosurgery, UKY; N. Millson, Neurosurgery, UKY; M. Al-Kawaz, Neurosurgery, UKY; S. Pahwa, Neurosurgery, UKY; J. Harp, Neurology, UKY; D. Dornbos III, Neurosurgery, UKY; K. Pennypacker, Neuroscience, UKY; A.M. Stowe, Neuroscience, UKY; J. Fraser, Neurosurgery, UKY; A.L. Trout, Neurosurgery, UKY

**Abstract:** Ischemic stroke treatments, mechanical thrombectomy (MT) and intravenous tissue plasminogen activator (tPA), assist in restoring blood flow, but do not guarantee good outcomes. Up to 50% of cerebral ischemic strokes can have blood extravagate into the tissue, (i.e., hemorrhagic transformation (HT)), which significantly worsen prognosis and highlights the need for blood biomarkers. Extracellular vesicles (EVs) are an understudied, yet highly relevant, source for biomarkers. We hypothesize that intracranial EVs-associated proteins, at the time of MT, can predict the severity of HT. The Blood And Clot Thrombectomy Registry And Collaboration" (BACTRAC; NCT03153683) is a human stroke biobank at the University of Kentucky that collects plasma samples at the time of MT. EVs were isolated, via size exclusion chromatography, from unbanked plasma and concentrated resulting in TEVs. Isolated protein was sent to Olink and ran on their inflammation panel. Demographics and medical histories of the subjects were exported from REDcap and investigators were blinded during EV analysis. Subjects (8 females/ 5 males) were an average age of  $71.1 \pm 11.7$  years. Intracranial EV STAMBP, a signal transducing adaptor protein that plays an essential role in cytokine mediated signaling, expression was negatively correlated to the degree of HT ( $r_s = -0.7339$ ,  $p = 0.0101$ ), infarct ( $r_s = -0.7091$ ,  $p = 0.0146$ ), and functional outcome (via modified Rankin Scale,  $r_s = -0.7643$ ,  $p = 0.0165$ ). EV-associated protein changes should be investigated further as target therapies during MT to improve outcomes.

Supported by: Funding by the National Center for Advancing Translational Sciences, National Institutes of Health (NIH), through grant number KL2TR001996.

Primary Presenter / email: **Walker, Mayah** / mjwa255@uky.edu  
**Staff**  
**Translational Research/Science**  
**Neurosurgery**



Presentation **78**

Abstract Title: **Growing Together: Enhancing Elderly Wellness in Rural Communities**

Author(s): W.M. Baker, Center of Excellence in Rural Health, U of Kentucky; M.D. Amburgey, Center of Excellence in Rural Health, U of Kentucky; J.R. Adams, Center of Excellence in Rural Health, U of Kentucky; D.S. Shepherd, Center of Excellence in Rural Health, U of Kentucky; D. Harmon, Appalachian Regional Healthcare

**Abstract:** Many residents of rural Harlan, Kentucky, struggle with food insecurity. Kentucky Homeplace, in collaboration with Appalachian Regional Healthcare and Roper's Market, distributed 100 senior food vouchers. The \$25 vouchers were given to seniors aged 65 and older who were food insecure, received SNAP or Medicare benefits, or fell below 250% of the federal poverty level. These vouchers were used to purchase fruits and vegetables, while CHWs identified and addressed additional needs. The program had three goals during its three-month duration: distributing healthy foods to Harlan County's senior population, enrolling seniors in case-managed care and referral programs, and strengthening relationships between ARH, local businesses, and Kentucky Homeplace. One hundred clients were reached, with an average poverty level of 163%. Though focused on Harlan, some clients from Leslie, Whitley, and Bell counties also received vouchers. The clients' ages ranged from 65 to 98. Participants received additional services, including help with medication access, diabetic services, dentures, eyeglasses, medical equipment, insurance, and home health supplies. The program provided \$44,404 in additional services and facilitated access to \$133,891.30 in free or reduced-cost medication. The return on investment was \$71.31.

Supported by:

Primary Presenter / email: **Adams, Joshua** / jrad227@uky.edu  
**Staff**  
**Health Equity Research**  
**Nutrition**

Presentation **79**

Abstract Title: **Impact of Moringa Oleifera Supplementation on Breast Milk Production in Lactating Mothers of Preterm Infants**

Author(s): B. Day, M. McCormick, A. Shamaei-Zadeh, J. Durbin, G. Thomas, B. Gagen, University of Kentucky (UK) College of Medicine; K. Mcquerry, UK Department of Biostatistics; D. Ross, UK Center for Clinical and Translational Science; M. Hanna, UK Department of Neonatology; S. L. Attia, UK Division of Pediatric Gastroenterology; J. Williams, University of Idaho Department of Animal, Veterinary and Food Sciences

**Abstract:** Background: Human milk improves health outcomes in preterm infants, but many mothers experience low milk supply. Moringa oleifera leaf powder (moringa) has increased milk production in mothers from Kenya and the Philippines, but its effectiveness for mothers in the United States is unknown.

Methods: This double-blind, randomized controlled trial was conducted at the University of Kentucky Neonatal Intensive Care Unit. Inclusion criteria: lactating adult mothers without active substance abuse; infants born at 28.0-36.6 weeks gestation and chronological age 2-6 weeks. Mothers were randomly assigned to receive 4g moringa or placebo (4g cornstarch) in 4 capsules twice daily for 7 days. Milk volume was recorded daily. The primary outcome was the change in 24-hour pumped milk volume. Adherence to the intervention was also assessed.

Results: Thirty-five mothers enrolled; 31% were lost to follow-up. Results remain blinded. The mean increase in milk production from day 0 to day 7 was  $17.1 \pm 105$  mL for group A and  $11.5 \pm 78$  mL for group B ( $p=0.88$ ). Average daily capsule intake was  $7.8 \pm 0.41$  in group A versus  $7.5 \pm 1.3$  in group B ( $p=0.4$ ). Average water intake was  $49 \pm 27$  oz in group A and  $69 \pm 34$  oz in group B ( $p=0.08$ ).

Discussion: The study was limited by a lack of standardized breast pumps and a small sample size, which may have underestimated the required sample due to age matching and post-COVID challenges.

Conclusions: Moringa did not significantly affect 24-hour milk output in mothers of preterm infants. These findings contrast with previous studies. Larger studies are warranted.

Supported by: NIH CTSA grant: UL1TR001998

Primary Presenter / email: **Day, Bridgette** / [btada227@uky.edu](mailto:btada227@uky.edu)  
**Professional Student (MD, PharmD, Dentistry, PT)**  
**Clinical Research**  
**Nutrition**

Presentation **80**

Abstract Title: **Mirabegron Treatment Reduces Myofibroblasts and CXCR2 Expression in Adipose Tissue in Obesity**

Author(s): Finlin BS, Department of Internal Medicine, University of Kentucky; Memetimin H, Department of Internal Medicine, U of Kentucky; Westgate PM, College of Public Health, University of Kentucky; Chen J, Department of Medicine, Division of Nephrology, University of Alabama at Birmingham; Dupont-Versteegden EE, Department of Rehabilitation Sciences, College of Health Sciences and Center for Muscle Biology, University of Kentucky; Kern PA, Department of Internal Medicine, University of Kentucky

**Abstract:** Introduction and Objective: Treatment with the  $\beta$ 3-adrenergic receptor (AR) agonist mirabegron improves insulin sensitivity,  $\beta$  cell function, and glucose tolerance in individuals with obesity, without weight loss or a change in brown adipose tissue (BAT). The objective of this study was to identify changes in the mRNA transcriptome of subcutaneous white adipose tissue (SC WAT) to identify mechanisms for the beneficial effects of mirabegron treatment.

**METHODS.** We utilized RNA seq and enrichment analysis to identify biological pathways changed by mirabegron treatment. We verified these changes by immunohistochemistry and performed mechanistic studies in differentiated human adipocytes in vitro.

**RESULTS.** Mirabegron treatment reduced myofibroblasts, which are fibrotic, and reduced CXCR2, which is involved in inflammation and chemotaxis, in SC WAT. Adipose tissue myofibroblasts were higher with obesity and negatively correlated with  $\beta$  cell function. Mirabegron inhibited TGF $\beta$  induction of the adipocyte mesenchymal transition pathway in differentiated adipocytes in vitro. Furthermore, mirabegron treatment reduced expression of snail, a transcription factor which promotes the mesenchymal transition pathway, in vitro and in vivo. We also found that mirabegron treatment reduced CXCR2 expression in SC WAT. CXCR2 was expressed by NK cells and mirabegron treatment reduced CXCR2 and the inflammation marker NK1.1 on NK cells in SC WAT.

**CONCLUSION.** Together, these results suggest two new mechanisms for improvement of the human SC WAT phenotype by mirabegron treatment to enhance glucose metabolism.

Supported by: TRIAL REGISTRATION. Clinicaltrials.gov NCT02596776 and NCT02919176  
FUNDING. 5R01DK124626, RO1DK112282, RO1DK107646, CTSA grant UL1TR001998, and P20 GM103527.

Primary Presenter / email: **Memetimin, Hasiyet** / mha242@uky.edu  
**Staff  
Clinical Trial  
Obesity**

Presentation **81**

Abstract Title: **Adipocyte-Specific Mineralocorticoid Receptor Deletion Improves Glucose Intolerance only in obese male mice**

Author(s): M.B. Turner, Department of Pharmacology and Nutritional Sciences, University of Kentucky, Lexington KY40536; C. Dalmaso, Department of Pharmacology and Nutritional Sciences, University of Kentucky, Lexington KY40536; A.S. Loria, Department of Pharmacology and Nutritional Sciences, University of Kentucky, Lexington KY40536

**Abstract:** The mineralocorticoid receptor (MR) is a ubiquitous nuclear receptor that is increased in visceral fat during obesity and mediates the metabolic effects of aldosterone and corticosterone. We have developed a cre-activated inducible adipocyte-specific MR knock-out (MRKO) mouse model to investigate the effects of MR deletion on obesity. Five-week-old MRKO male and female mice, and MRflox control littermates, were placed on a high-fat diet (HFD, 60% kcal/fat). After 9 weeks, tamoxifen treatment (40mg/kg) was conducted. Body composition and glucose tolerance were assessed before induction. At the endpoint, body weight and composition were not different between MRKO and MRflox mice of either sex. In male mice, glucose tolerance was similar before MR deletion (70529±4047 vs. 61737±5544 AUC, n=6, p=0.17), but it was improved in MRKO mice (62688±4028 vs. 47520±1715; p=0.01). In addition, plasma FGF21 was increased while insulin was reduced in MRKO males, showing a significant negative correlation (R<sup>2</sup> = 0.91 vs. 0.08, respectively). Aldosterone levels were not influenced by MR deletion (550±143 vs. 627±24 pg/mL; p=0.60) or female (1010±91 vs. 947±145 pg/ml; p=0.73). MR deletion increased the expression of Insulin receptor (INSR) (1.03±0.12 vs 1.88±0.25 ddCT<sub>2</sub>; p=0.02), insulin receptor substrate 1 (IRS-1) (1.04±0.16 vs. 1.89±0.27 ddCT<sub>2</sub>; p=0.03), and glucose transporter type 4 (GLUT4) (1.23±0.37 vs 2.81±0.48 ddCT<sub>2</sub>; p=0.03), and β-klotho expression in gWAT (1.19±0.34 vs 3.64±0.93 ddCT<sub>2</sub>; p=0.04). Conversely, MR deletion did not influence body adiposity, glucose homeostasis, or gWAT gene expression in obese female mice. Thus, this study is first to report that adipocyte MR could negatively regulate β-klotho expression in a sex-specific manner, impairing glucose homeostasis by reducing FGF21-dependent insulin signaling.

Supported by:

Primary Presenter / email: **Turner, Meghan** / meghan.turner@uky.edu  
**Graduate Student**  
**Basic Research**  
**Obesity**

Presentation **82**

Abstract Title: **Isokinetic Analysis: Quadriceps Autografts Cause Weaker Extension, Stronger Flexion Than Hamstring Autografts Post-ACL**

Author(s): B.A. Young; J.C. Dawahare; E.L. Major; A.V. Stone MD; University of Kentucky College of Medicine, Department of Orthopaedic Surgery, Lexington, Kentucky; C.L. Feingold; E.H. Lin; J.N. Liu MD; Keck School of Medicine of USC, Department of Orthopaedic Surgery, Los Angeles, California

**Abstract:** Purpose: The optimal graft choice for anterior cruciate ligament reconstruction (ACLR) remains a key question in orthopedic surgery. This study systematically reviews and compares isokinetic extensor and flexor strength in patients undergoing ACLR with different autografts to guide graft selection based on strength outcomes. We hypothesized that patients with quadriceps tendon (QT) grafts would have weaker postoperative isokinetic knee extensor strength but more favorable flexor strength compared to hamstring tendon (HT) and bone-patellar tendon-bone (BTB) grafts.

Methods: PubMed, Cochrane Library, EMBASE, and Google Scholar were searched on October 15, 2024.

Comparative studies on isokinetic knee strength after primary ACLR with QT, HT, or BTB grafts were included.

Exclusions: non-English, unavailable full texts, animal/cadaveric studies, or physeal-sparing techniques. Risk of bias was assessed via MINORS and Detsky. Key findings were quantified, and a subgroup meta-analysis was conducted with significance at  $p < 0.05$ .

Results: Seventeen studies with 1,705 ACLR patients and follow-ups up to 48 months were included. Of 13 studies comparing QT to HT grafts, nine showed weaker extensor strength and six showed greater flexor strength with QT. Four reported similar extensor and seven similar flexor results. For QT vs. BTB grafts, two studies showed similar extensor strength, while two had conflicting results. QT grafts showed better flexor strength in one study and similar strength in three.

Conclusion: Our data supports that following QT grafts, patients have weaker extension in the first postoperative year and similar or stronger flexion between 4 and 24 postoperative months than with HT grafts.

Supported by: The Professional Student Mentored Research Fellowship (PSMRF) Project is supported by the National Center for Advancing Translational Sciences through Grant UL1TR001998, UK HealthCare and the University of Kentucky College of Medicine. The project described was supported by the National Center for Advancing Translational Sciences, National Institutes of Health, through Grant UL1TR001998. The content is solely the responsibility of the authors and does not necessarily represent the official views of the NIH.

Primary Presenter / email: **Dawahare, James** / james.dawahare@uky.edu  
**Professional Student (MD, PharmD, Dentistry, PT)**  
**Clinical Research**  
**Orthopedic**

Presentation **83**

Abstract Title: **No Difference in Early Range of Motion: Robotic Assisted versus Conventional Instrumentation in Total Knee Arthroplasty**

Author(s): E. L. Major, College of Medicine, U of Kentucky; H. T. Stone, College of Medicine, U of Kentucky; J. R. Goetz, College of Medicine, U of Kentucky; R. S. Clarkson, Dr. Bing Zhang Department of Statistics, College of Arts and Sciences, U of Kentucky; G. S. Hawk, Dr. Bing Zhang Department of Statistics, College of Arts and Sciences, U of Kentucky; J. B. Selby, Department of Orthopaedic Surgery and Sports Medicine, U of Kentucky

**Abstract:** Introduction: Despite increasing use of robotic-assisted total knee arthroplasty (r-TKA), data on functional outcomes remains limited. This study evaluates 6-week range of motion (ROM) outcomes in patients undergoing r-TKA compared to the conventional intramedullary guide (c-TKA) to determine if ROM is improved with robotic assistance.

Methods: A retrospective analysis was conducted on patients who underwent primary TKA with r-TKA or c-TKA by a single surgeon from 2019 to 2023. Exclusion criteria included simultaneous bilateral, revision, unicompartmental, and post-traumatic conversion arthroplasties. Knee flexion and extension ROM were measured preoperatively and at standardized 2- and 6-week postoperative visits. Manipulation under anesthesia (MUA) rates for postoperative stiffness were also analyzed. Linear mixed models assessed between-group ROM differences over time, adjusting for race, sex, and body mass index. Linear and logistic regression models assessed similarly-adjusted between-group differences in clinical outcomes.

Results: 1138 patients (mean age 65.4±8.8 years) were included, with 732 in the c-TKA cohort (64.3%) and 406 in the r-TKA cohort (35.7%). Extension ROM between the c-TKA and r-TKA groups was not different preoperatively (1.3±6.7 vs. 0.9±5.0, p=0.228) or 6 weeks postoperatively (1.1±3.7 vs. 1.0±2.8, p=0.572). Similarly, flexion ROM between the groups was not different preoperatively (114.7±12.0 vs. 115.2±11.8, p=0.820) or 6 weeks postoperatively (110.8±12.6 vs. 112.4±11.5, p=0.273). MUA rates were also comparable (c-TKA: 2.6% vs. r-TKA: 3.0%, p=0.620).

Conclusion: Robotic-assisted TKA achieved comparable early postoperative ROM and MUA rates to conventional TKA. Future research should explore long-term ROM outcomes and how they correlate with patient-reported outcomes to further guide clinical practice.

Supported by: The Professional Student Mentored Research Fellowship (PSMRF) Project is supported by the National Center for Advancing Translational Sciences through Grant UL1TR001998, UK HealthCare and the University of Kentucky College of Medicine. The content is solely the responsibility of the authors and does not necessarily represent the official views of the NIH.

Primary Presenter / email: **Major, Edward** / elma245@uky.edu  
**Professional Student (MD, PharmD, Dentistry, PT)**  
**Clinical Research**  
**Orthopedic**

Presentation **84**

Abstract Title: **Helping Guide the Surgical Decision: A Review of Diagnostic Measurements to Assess Recurrent Patellar Instability Risk**

Author(s): B.A. Young, BS, Dept of Orthopedics and Sports Medicine, U of Kentucky; A. Reichard, MD, Dept of Orthopedics and Sports Medicine, U of Kentucky; E. Lin, BS, Dept of Orthopedics, USC; C. Feingold, BS, Dept of Orthopedics, USC; J.C. Dawahare, BS, Dept of Orthopedics and Sports Medicine, U of Kentucky; E.L. Major, BS, Dept of Orthopedics and Sports Medicine, U of Kentucky; J.N. Liu, MD, Dept of Orthopedics, USC; A.V. Stone, MD PhD, Dept of Orthopedics and Sports Medicine, U of Kentucky

**Abstract:** Purpose: This systematic review aims to identify the strongest diagnostic tools of recurrent instability and refine indications for isolated medial patellofemoral ligament reconstruction (MPFLR) and combined MPFLR with tibial tubercle osteotomy (TTO) following a primary dislocation.

Methods: Peer-reviewed articles were collected from PubMed, Embase, and Cochrane Library from inception to January 11, 2025. Inclusion criteria were primary studies evaluating optimal cutoff values for patellar tracking measurements. Exclusion criteria were patellofemoral diagnoses other than instability or trochlear dysplasia, prior surgical procedures of the knee, advanced imaging modalities (3- and 4-D CT and MRI), cadaveric or simulation studies. Diagnostic imaging measurements were selected for further analysis if they were evaluated in at least 3 articles.

Results: In total, 39 articles met inclusion criteria, ranging from 1971 to 2025, with 68 different measurement types reported. Eleven measurements were included in our analysis.

The measurements with the most robust data and strongest diagnostic ability were the Caton-Deschamps Index (CDI), Lateral Patellar Tilt (LPT), and Sulcus depth. Tibial Tubercle to Trochlear Groove Distance (TT-TG) and Tibial Tubercle to Roman Arch distance (TT-RA) also demonstrated strong diagnostic ability, although TT-RA was shown to be more reliable in cases of trochlear dysplasia. New or updated cutoffs were identified for each measurement.

Conclusion: Our data supports that following a primary dislocation, CDI and LPT measurements greater than updated cutoff values may be used as indicators for performing isolated MPFLR. Irregular sulcus depth and TT-TG, or TT-RA in the presence of trochlear dysplasia, support the need for concomitant TTO.

Supported by:

Primary Presenter / email: **Young, Brandon** / bayo231@uky.edu  
**Professional Student (MD, PharmD, Dentistry, PT)**  
**Basic Research**  
**Orthopedic**

Presentation **85**

Abstract Title: **Microgel-Based Macrophage Metabolic Reprogramming for Immune Modulation and Tissue Regeneration**

Author(s): Y. Zhang, Graduate student, Department of Biomedical Engineering, U of Kentucky; J. Patel, Graduate student, Department of Biomedical Engineering, U of Kentucky; J. Simkin, PhD, Assistant Professor, College of Medicine, Department of Microbiology, Immunology and Molecular Genetics, U of Kentucky; N. Su, PhD, Assistant Professor, F. Joseph Halcomb III, M.D. Department of Biomedical Engineering, U of Kentucky.

**Abstract:** Immune cells are the first responders to tissue injury and play an essential role in tissue regeneration. Metabolic reprogramming of macrophages from an inflammatory to a regenerative phenotype after injury offers a safe and effective way to promote regeneration. However, metabolites are mostly small molecules that diffuse quickly from the injury sites after bolus injection. To address this challenge, we have developed macroporous hydrogel scaffolds composed of individual microgels that serve as versatile carriers for macrophages and metabolites. We hypothesize that functionalizing the microgels with metabolites will create a desirable metabolic environment and actively control macrophage phenotype toward pro-regenerative status. Furthermore, the microgels will act as protective carriers, shielding macrophages from inflammatory factors in the injury site and enabling sustained delivery of metabolites to the encapsulated cells. To achieve this, we developed a microfluidic device that produced uniformly sized, photo-crosslinkable gelatin microgels and demonstrated their ability to sustain BSA release for up to 7 days. Moreover, microgels maintained high cell viability for encapsulated cells, demonstrating their potential to serve as a platform for cell-based therapies. Our ongoing work focuses on optimizing metabolite release kinetics by tuning microgel crosslink efficiency and evaluating the effects of varying metabolites on macrophage responses. We envision the microgel scaffolds, designed to create an optimal metabolic environment, as a versatile platform applicable to various tissue regeneration therapies.

Supported by: Biomedical Engineering Startup Funds.

Primary Presenter / email: **Zhang, Yunqian** / yunqian.zhang@uky.edu  
**Graduate Student**  
**Translational Research/Science**  
**Orthopedic**



Presentation **86**

Abstract Title: **Changes in Resting Mechanotransduction Current Modify the Cytoskeleton Actin Composition in Auditory Hair Cells**

Author(s): J. Castro-Jimenez., Department of Physiology, U of Kentucky; S. L. Macias-Palacio, Department of Physiology, U of Kentucky; A. C. Velez-Ortega, Department of Physiology, U of Kentucky

**Abstract:** Auditory hair cells have stereocilia protruding from their apical surface, which are actin-based organelles organized in a staircase manner. Mechano-electrical transduction (MET) channels are located at the tips of shorter rows (transducing) but not the tallest row (non-transducing). These channels regulate calcium influx into the cell, which impacts the morphology of transducing stereocilia. The stereocilia cytoskeleton has beta- and gamma-actin isoforms which have different polymerization and depolymerization rates in the presence of calcium. Therefore, we evaluated the effects of reduced resting calcium influx on the actin composition of stereocilia and cuticular plate in mouse auditory hair cells. We used a pharmacological MET channel blocker, immunolabeling against beta- and gamma-actin, and confocal microscopy with high-resolution objectives.

Our preliminary results show baseline differences in beta/gamma-actin ratios between non-transducing and transducing stereocilia. We are currently evaluating whether these differences are limited to early developmental ages by examining these ratios in adult mouse tissue. Additionally, after a 4h blockage of MET channels, we observed a reduction in beta-actin in transducing stereocilia. Moreover, after prolonged MET channel blockage, we observed an increase in gamma-actin expression in the cuticular plate of hair cells.

These findings indicate that changes in the resting MET current into auditory hair cells impact the actin composition of the cytoskeleton within stereocilia and cuticular plate. They also suggest key differences in the actin composition of transducing vs. non-transducing stereocilia, which could give us insight into the resistance to MET-dependent remodeling in the tallest row of the bundle.

Supported by: NIH/NIDCD: R01 DC021325 to A.C.V.

Primary Presenter / email: **Castro Jimenez, Juliana** / [jca474@uky.edu](mailto:jca474@uky.edu)  
**Staff**  
**Basic Research**  
**Otolaryngology**

Presentation **87**

Abstract Title: **Do changes in resting mechanotransduction current affect active actin remodeling at stereocilia tips in hair cells?**

Author(s): M. Gomez-Giraldo, Department of Physiology, U of Kentucky; A.C. Velez-Ortega  
Department of Physiology, U of Kentucky

**Abstract:** Auditory hair cells possess surface projections known as stereocilia, whose principal components are actin filaments and crosslinkers. At the tips of these stereocilia are mechano-electrical transduction (MET) channels, which play a crucial role in allowing the entry of positive ions upon sound-induced deflections. Even under resting conditions, there is an influx of positive ions, which is essential for maintaining stereocilia stability (Velez-Ortega et al., eLife, 2017).

Hair cells rely on stereocilia with precisely regulated lengths to detect sound. The regulation of actin dynamics is vital for controlling stereocilia length. A key feature of stereocilia is that actin remodeling occurs exclusively at their tips, while the shaft contains highly stable actin (Narayanan et al, Nat Commun, 2015). We hypothesize that a decrease in resting MET current alters stereocilia shape by increasing the size of the active actin region. To test this, we are pharmacologically blocking MET channels and using Fluorescence Recovery After Photobleaching (FRAP) to evaluate the regions of new actin incorporation in mice that express fluorescent actin in inner ear hair cells. Quantification of results is currently undergoing.

The findings from this project may shed light on the molecular mechanisms that drive the activity-dependent remodeling of the stereocilia cytoskeleton. These mechanisms likely impact the maintenance of hearing sensitivity and might play a role in the noise-induced or age-related degeneration of stereocilia that leads to deafness.

Supported by: NIH/NIDCD R01DC021325 to A.C.V.

Primary Presenter / email: **Gomez-Giraldo, Manuela** / mgo323@uky.edu  
**Undergraduate Student**  
**Basic Research**  
**Otolaryngology**

Presentation **88**

Abstract Title: **The Impact of Cochlear Implantation on Physical Activity and Quality of Life**

Author(s): Omnia Rehal, MD, David Adkins, MD, 1 Anthony Mahairas, BS, 1 Anthony Mangino, PhD, 2 Brian Kinealy, MD, 1 Daniel Yun, BS, 3 Amina Anwar, BS, 3 Matthew Bush, MD,

**Abstract:** Objective: This study was to evaluate the impact of cochlear implantation (CI) on physical activity (PA) among adult patients.

Methods: The study involved two phases: 1) A retrospective comparison of PA outcomes between adults with CIs and a control group of adults with untreated moderate to profound hearing loss and 2) A prospective longitudinal study comparing PA in adults before and following CI (PA assessments pre-operatively, 3 and 12 months post-activation). Participants completed PA assessments using one of two surveys: Physical Activity Scale for Elderly (PASE) for patients 65+, and the International Physical Activity Questionnaire (IPAQ) for patients <65. Quality of life was assessed using the Cochlear Implant Quality of Life survey.

Results: 211 patients participated in phase 1, and 37 patients participated in phase 2. In adults <65, the CI patients tended to be younger (45.5 vs 53.0,  $p=0.006$ ), less likely to receive Medicaid (32.4% vs 50.7%,  $p=0.005$ ), and more likely to have received a graduate or professional degree (24.7% vs 2.8%,  $<0.001$ ). Older adults (ages 65+) reported increased PA compared to adults in the control group (PASE Score 136 in +65 adults versus 101 in adults <65,  $p=0.03$ ). In younger patients (<65), the CI patients reported higher mean metabolic equivalents than adults in the control group ( $p=0.001$ ). In the second phase, adults receiving CI demonstrate a trend of increased PA at 3 and 12 month assessments.

Conclusions: CI appears to positively affect PA of adults with hearing loss. Further study is needed to understand this relationship.

Supported by:

Primary Presenter / email: **Rehal, Omnia / ore229@uky.edu**  
**Graduate Student**  
**Clinical Research**  
**Otolaryngology**

Presentation **89**

Abstract Title: **How Does D-Tubocurarine Blocker Affect the Mechano-Electrical Transducer Channel of the Inner Hair Cells?**

Author(s): L. Rendon, Department of Physiology, U of Kentucky; G. I. Frolenkov, Department of Physiology, U of Kentucky

**Abstract:** Mammalian hair cells in the inner ear convert mechanical stimuli provided by sound waves into electrical signals. In their apical surface they have hair bundles containing three rows of stereocilia. The shorter rows of stereocilia contain mechano-electrical transduction (MET) channels gated by extracellular tip links. When sound-induced movements in the cochlea deflect these bundles, increased tip-link tension opens the MET channels and creates an influx of cations (Ca<sup>2+</sup>, Na<sup>+</sup>, K<sup>+</sup>) into the cell, enabling hearing. Previous studies have shown that when MET channels are blocked with chemical agents, the stability of transducing stereocilia is affected (Vélez-Ortega, eLife, 2017). D-Tubocurarine is a well-known MET channel blocker. Different studies investigated the dose-response curve of MET channel blockage by D-Tubocurarine in mammalian outer hair cells (Kirkwood, Frontiers, 2017), however, its effects in the inner hair cells haven't been completely characterized. Therefore, the aim of this study is to determine the blocking properties of D-Tubocurarine on MET channels in inner hair cells. Based on unpublished results of our collaborator, Dr. Velez-Ortega, we hypothesize a higher half-blocking concentration for inner hair cells compared to outer hair cells. Using whole-cell patch-clamp recordings in mice inner hair cells and mechanically stimulating their bundles with a stiff probe, we can record the MET current when the cells are exposed to different concentrations of D-Tubocurarine. Overall, this study will explore the ability D-Tubocurarine to block MET channels in mammalian inner hair cells, thereby elucidating the potential differences between inner and outer hair cells, which are crucial for hearing.

Supported by: Luis Rendon, Gregory Frolenkov supported by NIDCD/NIH R01DC012564

Primary Presenter / email: **Rendon, Luis** / luis.rendon@uky.edu  
**Undergraduate Student**  
**Translational Research/Science**  
**Otolaryngology**

Presentation **90**

Abstract Title: **The Role of Hormone Replacement Therapy on Auditory Function in Post-menopausal Women: Systematic Review & Meta-analysis**

Author(s): A. N. Smock, College of Medicine, U of Kentucky; J. T. Leon, College of Medicine, U of Kentucky; J. B. Shinn, Department of Otolaryngology, U of Kentucky; A. D. Mahairas, Department of Research, U of Kentucky; L. E. Robinson, Medical Center Library, U of Kentucky; J. M. Volpenhein, Medical Center Library, U of Kentucky; A. A. Mangino, Department of Statistics, U of Kentucky; O. Rehal, College of Medicine, U of Kentucky

**Abstract:** Sex hormones are well-known for their roles in female development, as well as regulation of the menstrual cycle, pregnancy, lactation, and libido. Estrogen also has a significant impact on other non-reproductive processes within the body, such as regulating modulatory effects on the central auditory nervous system. As estrogen levels fluctuate over the course of a woman's lifetime, so does her auditory function. To date, there has been no meta-analysis performed that has quantitatively examined the relationship between hormones and hearing, specifically hormone replacement therapy (HRT) and its impact on auditory function in post-menopausal women. The aim of this study is to perform a systematic review with meta-analysis of the literature as it relates to the role of sex hormones on hearing by statistically analyzing literature related to hormones (estrogen and progesterone) and auditory function, which includes auditory electrophysiology and self-reported hearing loss. The goal is to understand the relationship between post-menopausal status and auditory processing when receiving HRT compared to no HRT. Literature will be reviewed based on specific inclusion/exclusion criteria. Once the appropriate literature has been collected, data from each of the studies will be compiled and statistically analyzed for significant relationships. It is hypothesized that the analysis of the available literature will support the positive impact of estrogen, and therefore HRT, on auditory function in post-menopausal women. This study will underscore the importance of evaluating not only the periphery, but also the entire auditory system in women undergoing hormonal changes and the potential for HRT as treatment.

Supported by: PSMRF: The Professional Student Mentored Research Fellowship (PSMRF) Project is supported by the National Center for Advancing Translational Sciences through Grant UL1TR001998, UK HealthCare and the University of Kentucky College of Medicine. The content is solely the responsibility of the authors and does not necessarily represent the official views of the NIH.

Primary Presenter / email: **Smock, Annie** / aeni225@uky.edu  
**Professional Student (MD, PharmD, Dentistry, PT)**  
**Clinical Research**  
**Otolaryngology**

Presentation **91**

Abstract Title: **Asprosin's Emerging Role in Thermal Pain Modulation**

Author(s): E. K. Anderson, College of Arts and Sciences, University of Kentucky; I. Mishra, Departments of Internal Medicine and Physiology, College of Medicine, University of Kentucky, Lexington, KY

**Abstract:** Nearly forty percent of the United States adult population suffers from some form of pain making it the most common reason for seeking clinical care. While persistent pain can be maladaptive, the acute pain response is an adaptive mechanism that protects the organism against dangerous stimuli. Rodent studies suggest that hunger selectively inhibits the behavioral responses to pain and that this analgesia is substantially mediated by a subpopulation of hypothalamic agouti-related protein- (AgRP) expressing neurons (the key hypothalamic cell type responsible for appetite stimulation). Asprosin is a newly discovered adipokine. Two neural functions of asprosin have been identified thus far. It stimulates feeding behavior through the activation of AgRP (Agouti-related peptide) neurons and stimulates thirst through the activation of Purkinje neurons of the cerebellum. We recently identified Protein Tyrosine Phosphatase Receptor  $\delta$  (Ptp $\delta$ ) as asprosin's neural receptor. Our current results suggest that asprosin, an orexigenic and dipsogenic hormone, also alters the nociceptive response in mice. We have found that asprosin deficient mice feel more pain (hyperalgesia), asprosin overexpression using adenoviral vectors and intranasal recombinant asprosin treatment does-dependently causes analgesia in wild type mice, and Ptp $\delta$  antagonism with small molecule inhibitor (7BIA, 7-butoxy analogue of illudalic acid) treatment decreases pain tolerance in wild type mice. This study thus far suggests an analgesic function of asprosin and its potential as a therapeutic for alleviating chronic pain.

Supported by: Neuroscience Research Priority Area Fellowship 2024

Primary Presenter / email: **Anderson, Emma** / ekan225@uky.edu  
**Undergraduate Student**  
**Translational Research/Science**  
**Pain Management**

Presentation **92**

Abstract Title: **Using Near Infrared Spectroscopy (NIRS) to Assess Pain in Neonates undergoing Circumcision- A Pilot Study**

Author(s): R. Bhavsar, I. Blanchard, M. Hanna, R. Torgalkar, H. Bada, T. Sithisarn, H. Huang, K. Williams, F. Akbari Department of Pediatrics/Division of Neonatology U of Kentucky; H. Puntney, Department of Pediatric Urology, U of Kentucky; G. Yu, Department of Biomedical Engineering, U of Kentucky

**Abstract:** Objective: Neonates respond adversely to painful events, which can lead to hyperalgesia and neurodevelopmental impairment. Near-infrared spectroscopy (NIRS) detects changes in cerebral regional saturation (CrSO<sub>2</sub>) and can be used to investigate cortical responses to painful stimuli. This study aims to assess the utility of NIRS by studying CrSO<sub>2</sub> changes during circumcision and compare them with other physiological parameters of pain.

Study Design: Male infants >36 weeks of gestational age undergoing circumcision were enrolled in this prospective observational study. Critically ill, drug exposed and those with congenital anomalies were excluded. CrSO<sub>2</sub> were recorded using NIRS using four probes: 2 placed over somatosensory areas and 2 prefrontal vortices bilaterally. CrSO<sub>2</sub> was recorded at baseline and during eight steps of circumcision 1. Sucrose, 2. Alcohol prep, 3. Lidocaine injection, 4. Betadine prep, 5. Incision, 6. Attachment of Gomco clamp, 7. Gomco clamp on, 8. Gomco clamp off. Heart rate, oxygen saturations (SpO<sub>2</sub>) and Neonatal Infant Pain Scale (NIPS) scores were recorded at each step of the procedure.

Results: Noxious stimuli during circumcision led to lower cerebral regional saturation as compared to baseline. Lower CrSO<sub>2</sub> were observed in correlation with higher NIPS scores and heart rates over the right somatosensory cortex which was statistically significant. The somatosensory region is more sensitive to acute pain response compared to the prefrontal cortex.

Conclusions: NIRS may complement heart rates, SpO<sub>2</sub> and NIPS scores in neonatal pain assessment, however larger studies are needed to confirm correlation.

Supported by: University of Kentucky Center for Clinical and Translational Science (CCTS) Small Grants program

Primary Presenter / email: **Bhavsar, Ravi / ravi.bhavsar@uky.edu**  
**Faculty**  
**Clinical Research**  
**Pain Management**

Presentation **93**

Abstract Title: **Symptom Burden Among Housing-Insecure Patients: A Comparative Study**

Author(s): A. Latimer, College of Social Work and College of Medicine, U of Kentucky; L. Bond, College of Social Work, U of Kentucky; J. McFarlin, College of Medicine, U of Kentucky; R.B. Conley, College of Social Work, U of Kentucky; L. Ragsdale, College of Medicine, U of Kentucky.

**Abstract:** Homelessness has increased, with 653,104 people identified as homeless on a single night in 2023, a 12.1% rise from the previous year. Housing insecurity is associated with worse health outcomes, including higher morbidity and mortality. Many housing-insecure individuals face serious health conditions, but little is known about their symptom burden and health quality. This study compares permanent and temporary housed individuals' health quality and symptom burden.

On January 29, 2025, we surveyed hospitalized patients about their housing conditions and health outcomes. We used the 5-item Integrated Palliative Care Outcome Scale (IPOS) to assess symptom burden and overall health. The primary housing variable included housing type before admission, including renting, owning, living with friends or family, or staying in transitional housing (e.g., motel, shelter). Controlled environments were excluded in this analysis.

A total of 246 adult patients completed the survey, including demographic questions representing predominately white (82.1%) men (51.6%) aged 56 (SD=16.57). Most of the sample reported having a permanent place to stay by either renting or owning their home (81%), with 47 individuals reporting temporary housing (19%). Compared to patients with permanent housing who felt at peace most of the time ( $M= 2.75, \pm 1.43$ ), patients in temporary housing felt at peace occasionally ( $M= 3.44 \pm 1.56, t(241) = -2.88, p = .002$ ).

Despite similar ratings for common symptoms like pain, shortness of breath, and anxiety, individuals without permanent housing reported significantly less frequent feelings of peace. These preliminary findings highlight housing security as a critical social determinant of health.

Supported by: (CCTS) Small Grants program & College of Social Work

Primary Presenter / email: **Latimer, Abigail** / [abbie.latimer@uky.edu](mailto:abbie.latimer@uky.edu)  
**Faculty**  
**Health Equity Research**  
**Pain Management**



Presentation **94**

Abstract Title: **Purification and Molecular Networking for Dereplication of Cyanobacterial Compounds with Sigma-2 Affinity**

Author(s): Sahar Mofidi Tabatabaei, Department of Pharmaceutical Sciences, College of Pharmacy, University of Kentucky, Lexington, KY; Kevin J. Tidgewell, Department of Pharmaceutical Sciences, College of Pharmacy, University of Kentucky, Lexington, KY

**Abstract:** Marine cyanobacteria are a promising natural product source for drug discovery since they produce diverse secondary metabolites with a wide range of biological activities including neuroprotectivity, antiviral, and cytotoxicity.

Our lab focuses on the Nervous System (NS) activity of these microorganisms. Fifty different cyanobacterial collections were extracted, fractionated, and examined by an in vitro radioligand binding assay against a panel of NS targets. 32% of fractions showed binding affinity to the sigma receptors, and 126 fractions selectively bound to the sigma-2 receptor, which has been recently shown to have a role in neuropathic pain and substance use disorders. We used molecular networking to prioritize our fractions by dereplication of the known compounds based on a library search of MS/MS in GNPS. The fractions F2, F3, and F4 of DUQ0048 exhibited selective binding affinity to the sigma-2 receptor, exceeding 50% at a concentration of 10  $\mu$ M. The chemical composition of this cyanobacteria was investigated in detail using molecular networking. The results led to the identification of ten compounds, three of them were alkaloids, three were betaine lipids called DGTS and the other four were fatty acid derivatives. We have isolated one alkaloid from this extract and confirmed its <sup>1</sup>H-NMR of the structure as well as its MS to prove the presence of this compound in this extract.

In our future works, we will use molecular networking to analyze the other selective sigma-2 fractions and prioritize them based on the type of compounds present in them.

Supported by:

Primary Presenter / email: **Mofidi, Sahar** / sahar.mofidi@uky.edu  
**Graduate Student**  
**Natural Product Drug Discovery**  
**Pain Management**

Presentation **95**

Abstract Title: **Assessment of Urine Culture Stewardship in Pediatrics at UK Healthcare After Adjusting Cutoff for Pyuria on Urinalysis**

Author(s): Joel Howard MD, Department of Pediatrics, U of Kentucky; Andrew Frawley, Undergraduate Student, U of Kentucky

**Abstract:** Urinary Tract Infections (UTIs) are common in children. A UTI occurs when bacteria adhere to and invade the cells lining the urogenital tract. 3 components are required to diagnose a UTI, including consistent clinical symptoms, evidence of inflammation in the urinary tract, and bacteria known to cause this infection present in urine in sufficient quantity. To assess the urinary tract for inflammation, a urinalysis (UA) is done to quantify the number of white blood cells (WBCs) present. The cutoff for this value can vary depending on the desired sensitivity and specificity, with most pediatric providers using 5 WBCs/High Power Field (HPF) and most adult providers using 10 WBCs/High Power Field. On January 8, 2024, UK Healthcare implemented a reflex urine culture test when urinalysis results were >10 WBCs/HPF in all patients. Using EPIC Slicer-Dicer software, we evaluated whether this change decreased the number of urine cultures (UCX) obtained between a 6 month pre-test and 6 month post-test period, and whether that decrease was explained by the increased WBC cutoff. We found that ratio of UCX to UA did decrease in the post-test period (54.5% versus 59.8%) and this was statistically significant (P-value: 0.0004). When specifically looking at UCX obtained with 6-10 WBCs/HPF, there was a significant drop (53.1% versus 66.2%, P-value: 0.0009). While UCX related to the WBC cutoff change were decreased, this did not have a large impact on the overall collection of urine cultures.

Supported by:

Primary Presenter / email: **Frawley, Andrew** / [Andrewfrawley@uky.edu](mailto:Andrewfrawley@uky.edu)  
**Undergraduate Student**  
**Clinical Research**  
**Pediatrics**

Presentation **96**

Abstract Title: **High-Fat Diet in Early Life Primes Hepatic and Vascular Responses to Sepsis in a Pediatric Murine Model**

Author(s): Y. Alsiraj, Division of Pediatric Research, Department of Pediatrics, U of Kentucky; H. Huang, Division of Pediatric Research, Department of Pediatrics, U of Kentucky; R. Shoemaker, Division of Pediatric Research, Department of Pediatrics, U of Kentucky; J. Bauer, Division of Pediatric Research, Department of Pediatrics, U of Kentucky

**Abstract:** Pediatric obesity increases the risk of chronic diseases such as hepatic steatosis, cardiovascular disease, and worsened sepsis outcomes. However, the clinical interactions between these morbidities remain poorly defined, and an appropriate preclinical model is lacking. Here, we examined a murine model of early-life high-fat diet (HFD) exposure to investigate hepatic and cardiovascular responses to sepsis. We hypothesized that HFD-induced fatty liver would exacerbate inflammatory responses to low-dose lipopolysaccharide (LPS) challenge.

C57BL/6J mice (3–4 weeks old) were fed either an HFD (16% saturated fat, 1.25% cholesterol) or an isocaloric control diet (CD, 5% saturated fat, 0.03% cholesterol) for four weeks, followed by a single sub-lethal LPS dose (0.5 mg/kg, i.p.) or saline. Mice were sacrificed at multiple time points (0.5–24 hours; n=5/group). Hepatic TLR4 expression, plasma lipids, cytokines (IL6, TNF- $\alpha$ , IFN- $\gamma$ ), and serum amyloid A (SAA) levels were measured. HFD-fed mice exhibited significant hypercholesterolemia (total cholesterol: 343.5 vs. 158.1 mg/dL; LDL: 217.5 vs. 113.0 mg/dL, p<0.05), elevated baseline SAA (144.3 vs. 1.49  $\mu$ g/mL, p<0.01), and increased hepatic TLR4 expression (3.14-fold, p<0.05), which was further amplified by LPS. Inflammatory cytokines and SAA surged in HFD+LPS mice, alongside impaired vascular responses marked by reduced acetylcholine-induced endothelial dependent vasorelaxation (vasorelaxation: 60.8% vs. 79.1% in CD, \*p<0.05). Our findings suggest that early-life HFD exposure primes the immune system, promoting a hyper-inflammatory state and vascular dysfunction, supporting the use of this model to study pediatric obesity-related sepsis risk.

Supported by: Ohio Valley AHA 0525318B

Primary Presenter / email: **Alsiraj, Yasir** / YAAL223@uky.edu  
**Faculty**  
**Basic Research**  
**Pediatrics**

Presentation **97**

---

Abstract Title: **Exploring Positive Distractions in Pediatric Healthcare Design**

Author(s): B. Nichols, School of Architecture, U of Kentucky

---

**Abstract:** This research explores the role of positive distractions in healthcare environments, emphasizing architectural strategies to enhance patient well-being. Specifically, it examines how access to nature, color, and art installations in pediatric spaces contribute to reducing stress, improving satisfaction, and promoting healing. Traditionally, healthcare design has prioritized clinical efficiency over patients' emotional and psychological needs. However, research underscores the value of incorporating elements that shift patients' focus from the clinical setting—known as positive distractions (Ulrich, 2000a). A literature review revealed strong evidence that natural elements have a calming effect on young patients (Gill, 2014; Tillmann et al., 2018). By integrating biophilic design, this research provides insights into creating holistic environments that support both emotional and physical healing.

The study employed a multi-faceted methodology, beginning with shadowing professionals at Lexington Shriners Hospital to gain insights into healthcare operations and observe existing design applications. Additionally, modeling programs were examined, aligning closely with architectural tools. A site visit to MUSC Shawn Jenkins Children's Hospital provided real-world examples of positive distractions in action. These experiences, combined with qualitative research and patient feedback, informed the study's conclusions.

The research culminated in the design concept Zoo to You, an immersive pediatric space integrating biophilic elements and interactive features. This concept creates a sensory-rich environment that fosters relaxation and engagement for patients and families. Findings indicate that when available, positive distractions are actively used and significantly enhance the healthcare experience. This research highlights the importance of designing spaces that prioritize healing, comfort, and emotional well-being in patient-centered care.

---

Supported by: UK College of Design Undergraduate Research Fellowship

---

Primary Presenter / email: **Nichols, Brayden** / [bpni225@uky.edu](mailto:bpni225@uky.edu)  
**Undergraduate Student**  
**Health Design Research (Architecture)**  
**Pediatrics**

---

Presentation **98**

Abstract Title: **Patterns in Medicaid Claims for Preterm Births in the State of Kentucky: 2017-2021**

Author(s): A. Schadler, Department of Pediatrics, UK HealthCare, B. Porter, Department of Pediatrics, UK HealthCare, P. Giannone, Department of Neonatology, UK HealthCare, M. Hanna, Department of Pediatrics, UK HealthCare, H. Huang, Department of Pediatrics, UK HealthCare, J. Bauer, Department of Pediatrics, UK HealthCare,

**Abstract:** Background: Preterm neonate survival has significantly improved but the severity and costs continue to rise and disparities in outcomes exist. Understanding of premature birth patterns provides opportunities for enhancement of healthcare strategies in our region.

Objective: Utilize Medicaid claims data for KY births (from 2017-2021), with emphasis on levels of prematurity, regional distributions, major morbidities and costs in the first year of life.

Design/methods: We compare geographic and temporal trends in all term vs preterm and extremely preterm births using statewide claims data for first year of life. County and regional distributions, billing trends, patient transports, and other driving variables were investigated. Bivariate statistics are used to analyze relationships and trends in the dataset.

Results: Over 20million claims from 189,000 KY births were studied. Throughout the 5yrs reviewed premature births remained near 11% whereas Neonatal Abstinence Syndrome (NAS) steadily declined ( $p<0.05$ ). Costs in first 180d was inversely related to gestational age, with 20-fold higher cost near viability limit vs term. No geographic bias was observed across the state for rates of prematurity, whereas striking bias was observed for NAS related cases. NAS was associated with a 2-fold higher rate of prematurity and 5-fold higher cost/case when compared to term deliveries.

Conclusions: In Kentucky, prematurity and extreme prematurity are exceedingly costly and small improvements in gestational age could translate to major savings and improved outcomes. Region specific strategies for addressing interactions of NAS may be particularly relevant. Statewide patterns in Medicaid claims can be used for insights and opportunities for prevention and treatment are warranted.

Supported by: KY Cabinet for Health and Family Services Grant

Primary Presenter / email: **Schadler, Aric** / [schadler@uky.edu](mailto:schadler@uky.edu)  
**Staff**  
**Community Research**  
**Pediatrics**

Presentation **99**

Abstract Title: **Investigation of Prenatal Maternal Diagnosis Codes in Relation to Poor Birth Outcomes In Kentucky Using Medicaid Claims**

Author(s): A. Schadler, Department of Pediatrics, UK HealthCare, B. Porter, Department of Pediatrics, UK HealthCare, P. Giannone, Department of Neonatology, UK HealthCare, M. Hanna, Department of Pediatrics, UK HealthCare, J. O'Brien, Department of Obstetrics and Gynecology, UK HealthCare, H. Huang, Department of Pediatrics, UK HealthCare, J. Bauer, Department of Pediatrics, UK HealthCare.

**Abstract:** Background: Premature birth is a major medical problem in Kentucky and elsewhere and many perinatal factors contribute to its occurrence and the derived outcomes. Better understanding of linkages of maternal health status and birth outcomes could provide opportunities for improved care.  
Objective: Utilize statewide Medicaid claims data for Kentucky and related Maternal ICD10 codes from births 2017-2021; including maternal ICD10 codes/claims for 1yr prior to birth. Relate prenatal maternal ICD10 codes to birth outcomes and neonatal status in the first 180d of postnatal life.  
Design/methods: A total of 189,000 births were reviewed, wherein maternal ICD10 codes during prenatal year were investigated in relation to birth outcomes. Comparisons of maternal conditions in cases of term (37+wks gestation), preterm (<37wks), and extremely preterm births (<28wks) were conducted. Maternal prenatal substance use, hemodynamic status, obesity and metabolic status, and infection status were investigated as prenatal domains of influence regarding birth outcomes. Parametric and nonparametric tests were used as appropriate and  $p < 0.05$  was deemed significant.  
Results: Maternal prenatal nicotine, alcohol, or illicit drug use increased odds of preterm birth by ~1.6 fold and extreme prematurity by ~2.0 fold. Perinatal hemodynamic conditions (pre-existing hypertension, gestational hypertension, preeclampsia) increased prematurity or extreme prematurity risks 2.5-5.0 fold. Premature membrane rupture of COVID diagnosis was also predictive of preterm birth (6.0 and 1.3-fold risk respectively).  
Conclusions: These findings illustrate that Medicaid claims can be used to identify variables for use in predictive modeling of birth outcomes, and support the concepts of substance use, hemodynamics, metabolic status, and infection status can be used as prenatal risk domains for stratifying early birth risks. Further investigation of such approaches are clearly warranted.

Supported by: KY Cabinet for Health and Family Services Grant

Primary Presenter / email: **Schadler, Aric** / [schadler@uky.edu](mailto:schadler@uky.edu)  
**Staff**  
**Community Research**  
**Pediatrics**

Presentation **100**

Abstract Title: **Effects of Probiotic Usage on Finnegan Scoring and Length of Treatment for Neonatal Opioid Withdrawal Syndrome**

Author(s): A. L. Stacy, Department of Pediatrics/Division of Neonatology, U of Kentucky; H. S. Bada, Department of Pediatrics/Division of Neonatology, U of Kentucky; T. Sithisarn, Department of Pediatrics/Division of Neonatology, U of Kentucky; K. Stiles, College of Medicine, U of Kentucky

**Abstract:** Objective: The Gut-Brain Axis is the bidirectional pathway between the gastrointestinal tract and the nervous system. There is little knowledge of how infants with neonatal opioid-withdrawal syndrome (NOWS) are neurologically impacted by dysbiosis or how probiotic use may impact NOWS symptoms and treatment. Study Design: This is a retrospective chart review for 50 infants admitted for monitoring and/or treatment of NOWS, grouping them by presence of probiotic treatment. We compared lengths of stay and treatment along with average Finnegan scores for days 1-3.

Results: Infants given probiotics during admission had significantly longer lengths of stay and treatment as well as higher scores on day 1 of NOWS treatment compared to infants not given probiotics. There were significantly more infants who received breastmilk in the non-probiotic group.

Conclusions: The probiotic group exhibited more severe symptoms and required a lengthier treatment compared to the non-probiotic, although correlation cannot be concluded due to initiation of probiotics after treatment onset.

Supported by: NIH 1R01DA043519-01, Children's Miracle Network Grant, CTSA grant UL1TR001998

Primary Presenter / email: **Stacy, Audra** / audra.stacy@uky.edu

**Faculty**  
**Clinical Research**  
**Pediatrics**

Presentation **101**

Abstract Title: **Revolutionizing PAH Treatment: A Groundbreaking Protocol for Sotatercept Initiation**

Author(s): E. C. Major, Division of Cardiovascular Medicine, U of Kentucky; G. P. Leung, Department of Pharmacy, Division of Cardiovascular Medicine, U of Kentucky; J. S. Smith, Division of Cardiovascular Medicine, Division of Pulmonary, Critical Care, and Sleep Medicine, U of Kentucky

**Abstract:** Pulmonary arterial hypertension (PAH) is a progressive disease characterized by marked elevation of pulmonary arterial pressure leading to vascular and right ventricular remodeling. Existing therapies have focused on vasodilation to reduce right heart failure, however, disease burden remains high for many patients. Sotatercept, a first-in-class activin signaling inhibitor, provides a new mechanism of treatment, while also posing unique challenges due to risk of erythrocytosis and thrombocytopenia.<sup>1</sup> Recommendations include obtaining a complete blood count every three weeks prior to the first five doses.<sup>2</sup> With no specific guidance on implementation and tracking, our team developed a comprehensive protocol to streamline this process. The goals of the protocol are to identify all necessary tasks and assign each to a specific team member, minimizing patient treatment delays and potential harm.

The protocol involves a coordinated multidisciplinary effort. Nurse coordinators oversee protocol implementation and assist team members as needed. Medical assistants place reminder calls and retrieve lab results. Cardiology pharmacists conduct pre-dose visits to review lab results and assess patients' clinical status, including symptoms and improvements; providers offer clinical expertise and decision-making as required. This collaborative approach has enhanced efficiency and optimized patient outcomes.

During implementation, 47 patients were successfully initiated on sotatercept using this new system. The protocol effectively manages the complex requirements of sotatercept initiation and clearly delineates tasks, providing a structured and reliable method to ensure patient safety and treatment schedule adherence. This initiative underscores the importance of interdisciplinary collaboration and innovative problem-solving in clinical practice, setting a precedent for future protocols.

Supported by:

Primary Presenter / email: **Major, Elaine** / [elaine.major@uky.edu](mailto:elaine.major@uky.edu)  
**Staff**  
**Protocol implementation**  
**Policy**



Presentation **102**

Abstract Title: **Comparing Robotic and Video-Assisted Techniques for Minimally Invasive Lobectomy: A Single-Center Experience**

Author(s): Cindy Lin, Medical Student Researcher; Siby Saha, Research Mentor, Departments of Cardiovascular Surgery, U of Kentucky

**Abstract:** Lobectomy offers the best chance for curing non-invasive, non-small cell lung cancer. Traditionally, thoracotomy was the only approach for performing a lobectomy. However, in recent years, advancements in robotic-assisted thoracic surgery (RATS) and video-assisted thoracic surgery (VATS) have provided alternative options. Both RATS and VATS techniques have been shown to result in better outcomes and fewer complications compared to traditional thoracotomy. This has led to an ongoing debate about which of the two techniques—RATS or VATS—offers superior results.

The aim of this study was to compare the outcomes and complications associated with RATS and VATS. We conducted a retrospective chart review at Chandler Hospital, using the EPIC system, to analyze patient data from January 2021 to December 2022. Our findings indicate that RATS is associated with less chest tube drainage and fewer patients requiring post-surgical ICU care. In contrast, VATS is linked to a lower incidence of gastrointestinal complications and pneumonia, as well as a shorter duration of ICU stays for those who do require ICU admission. Based on these results, we conclude that VATS may offer slightly more favorable outcomes compared to RATS.

Supported by: NIH CTSA grant (UL1TR001998), KL2 grant (KL2TR001996), TL1 grant (TL1TR001997), UKYCOM PSMRF Program, IRB

Primary Presenter / email: **Lin, Cindy** / cli303@uky.edu  
**Professional Student (MD, PharmD, Dentistry, PT)**  
**Clinical Research**  
**Pulmonary**

Presentation **103**

Abstract Title: **The Future is Ferumoxytol: A Case Based Report on its Use in Women's Vascular Imaging**

Author(s): Tyler Ohler, University of Kentucky College of Medicine- Bowling Green Campus  
Katelin Maggard, University of Kentucky College of Medicine- Bowling Green Campus; Liisa Bergmann, MD, MBA, University of Kentucky College of Medicine Department of Radiology

**Abstract:** Venous thromboembolism presents a significant risk in women, particularly during pregnancy, contributing to increased morbidity and mortality. Traditional vascular imaging modalities rely on gadolinium-based contrast agents, which carry potential risks for pregnant women. Ferumoxytol, an iron oxide nanoparticle, offers a safer alternative. Its prolonged intravascular retention time, make it particularly advantageous for high-resolution vascular imaging.

This case-based report explores the use of ferumoxytol in a 36-year-old female with esophageal varices and portal hypertension, who required detailed vascular assessment. Standard imaging with gadolinium contrast was contraindicated, prompting the use of ferumoxytol-enhanced MRI. The resulting images provided high-resolution visualization of abdominal and systemic vascular structures.

Ferumoxytol-enhanced MRI offers several advantages over traditional contrast agents, including reduced risk of nephrotoxicity, prolonged imaging window, and superior vascular delineation. These attributes make it a promising tool for vascular imaging in pregnant patients and individuals with renal impairment.

This report highlights the growing role of ferumoxytol in advanced vascular imaging, particularly in women's health. As awareness and clinical experience with ferumoxytol increase, it may provide an alternative to gadolinium-based contrast. Further research and expanded clinical applications will continue to refine its role in medical imaging.

Supported by:

Primary Presenter / email: **Ohler, Tyler / Tsoh222@uky.edu**  
**Professional Student (MD, PharmD, Dentistry, PT)**  
**Clinical Research**  
**Radiology**

Presentation **104**

Abstract Title: **Exploring Risk and Protective Factors of E-cigarette and Tobacco Use among African American Youth in the United States**

Author(s): R. E. Adesiyon, Department of Kinesiology and Health Promotion, University of Kentucky; M.J. Ickes, Department of Kinesiology and Health Promotion, University of Kentucky; L. Nichols, Education Library, College of Education, University of Kentucky, KY.

**Abstract:** Introduction: E-cigarette and tobacco use among African American youth in the United States has emerged as a public health issue. While existing research explores adolescent vaping behaviors in general, limited research focuses on the unique risk and protective factors influencing African American youth. Purpose: This scoping review synthesizes evidence on the risk and protective factors influencing e-cigarette and tobacco use among African American youth in the United States. Methods: Following PRISMA-ScR guidelines, a systematic search was conducted across five databases, identifying 14 studies examining risk and protective factors at individual, relationship, community, and societal levels. Results: Key risk factors included peer influence, targeted marketing, and low harm perception, while protective factors included parental monitoring, health literacy, and culturally relevant prevention efforts. Discussion: Findings underscore the need for tailored interventions and culturally responsive strategies to support tobacco prevention. Conclusion: Addressing e-cigarette and tobacco use among African American youth requires a multilevel approach, highlighting the importance of prevention programs that consider their specific cultural context to reduce initiation and continued use.

Supported by:

Primary Presenter / email: **Adesiyon, Raphael** / read223@uky.edu  
**Graduate Student**  
**Health Equity Research**  
**SUD**

Presentation **105**

Abstract Title: **Opioid Overdose Harm Reduction among Black Adults: An Adapted Intervention**

Author(s): B. Miller-Roenigk, Department of Educational, School, and Counseling Psychology, U of Kentucky; P. Wheeler, Department of Psychology, U of Cincinnati; A. Smith, Department of Educational, School, and Counseling Psychology, U of Kentucky

**Abstract:** Background. Opioid-related overdoses have disproportionately impacted Black Americans, especially in KY and OH. These overdoses are caused by opioid misuse, co-use of opioids and stimulants, and contamination of stimulant drugs. Despite higher overdose rates, Black adults that use opioids and stimulants are underrepresented in harm reduction literature and have limited culturally relevant harm reduction interventions. Aim. Aim 1 seeks to culturally adapt an opioid overdose harm reduction intervention among Black men and women using a community engaged approach. Method. The Harm Reduction Coalitions (HRC) Overdose Prevention and Naloxone Manual was culturally adapted among n = 6 Black adults stratified by age and gender in Louisville, KY with past 30-day opioid and stimulant use. Adaptation occurred across two sessions, and distribution of Narcan and Fentanyl Test Strips was provided. Results. Preliminary analysis indicated recommended adaptations. Themes included, 1) culturally aligned visuals, testimonies, and examples; 2) overdose statistics among Black populations; 3) motivations for wellness discussion; 4) simple presentation and repetition; 5) dispelling myths related to overdose interventions and preventions in the Black community; and 6) coping strategies and alternatives to drug use discussion. Conclusion. Aim 1 highlighted several factors to make opioid overdose harm reduction interventions more accessible and culturally appropriate among Black adults at risk for overdose. Aim 2 will pilot test the adapted intervention. Funding. Research was supported by the NCRR, NCATS, and NIH through Grant UL1TR001998. The content is solely the responsibility of the authors and does not necessarily represent the official views of the NIH.

Supported by: Research was supported by the NCRR, NCATS, and NIH through Grant UL1TR001998. The content is solely the responsibility of the authors and does not necessarily represent the official views of the NIH.

Primary Presenter / email: **Smith, Adrienne** / [brittany.miller-roenigk@uky.edu](mailto:brittany.miller-roenigk@uky.edu)  
**Postdoctoral Scholar/Fellow**  
**Health Equity Research**  
**SUD**

Presentation **106**

Abstract Title: **Acute Cannabis and Alcohol Effects on Simulated Driving Performance and Subjective Driving Confidence in Humans**

Author(s): Maribeth Stafford (1), Paul Nuzzo (1,2), Michelle Lofwall (1-3), Laura Fanucchi (1,4), Sharon Walsh (1-3), Shanna Babalonis (1,2); 1) University of Kentucky College of Medicine; 2) UK Departments of Behavioral Science and Center for Drug and Alcohol Research; 3) UK Psychiatry; 4) UK Internal Medicine

**Abstract:** Introduction: As cannabis becomes more widely available, determining its effects on driving performance is imperative to public health. The aim of the current study was to compare a range of inhaled cannabis doses (relevant to current medical/recreational products) to the effects of an intoxicating dose of oral alcohol.

Methods: Healthy cannabis users were enrolled in this within-subject, randomized, double-blind, double-dummy, placebo-controlled, outpatient study (n=9). Across 5 experimental sessions the effects of inhaled cannabis (0, 15, 30 mg THC; 15 mg THC+7.5 mg CBD) and oral alcohol (0, 0.8g/kg [15% less for women]) were assessed. Data were collected at baseline and 6 hrs after drug administration. Primary outcomes included standard deviation of lane position (SDLP), variability of speed and steering, and reaction time. Secondary outcomes included subjective ratings driving performance and abuse potential outcomes.

Results: Alcohol produced robust impairments in simulated driving performance (e.g., increased speed, SDLP;  $p < .05$ ), while cannabis negatively impacted a different array of driving outcomes (e.g., decreased brake force, headway distance;  $p < .05$ ). All active doses of alcohol and cannabis decreased driving confidence (e.g., willingness to operate a real vehicle;  $p < .05$ ) and increased ratings on abuse potential outcomes ( $p < .05$ ). Active alcohol and 30mg THC increased ratings of subjective impairment ( $p < .05$ ).

Conclusions: Although cannabis did not produce profound alcohol-like impairment, it was not without risk. All active cannabis doses decreased participants' willingness to drive and high dose THC increased self-reported impairment. Overall, even in a sample of regular cannabis users, cannabis decreased driving acuity and confidence in safe driving ability.

Supported by: National Institute on Drug Abuse Grant (R21DA045101); PSMRF: NIH CTSA Grant (UI1TR001998)

Primary Presenter / email: **Stafford, Maribeth** / mpst238@uky.edu  
**Professional Student (MD, PharmD, Dentistry, PT)**  
**Clinical Trial**  
**SUD**

Presentation **107**

Abstract Title: **How Physicians Across Different Specialties Determine the Risk of Opioid Misuse Upon Prescription**

Author(s): Sameer Desai MD, Brian Wilhoit, Sasha Sairajeev

**Abstract:** Background: There is no standardized screening tool for risk of opioid misuse at the University of Kentucky (UK). Physicians who prescribe opioids must adequately evaluate the pain of a patient while also minimizing the risk of the patient developing opioid use disorder. Pain management approaches differ depending on medical specialty and level of training which can influence the opioid prescribing behaviors of physicians.

Objective; The objective of this study is to determine whether there is a significant difference among physician specialties and education levels regarding strategies used to determine the risk of opioid misuse.

Methods: A 26-question RedCap Likert scale survey was sent to emergency medicine (EM) attendings, EM residents, and faculty from other specialties at UK. The EM attendings and residents had the survey emailed to them. For non-EM faculty, we contacted the program directors who distributed the survey to their department's faculty. The survey's questions were based on the opioid risk assessment score calculation found on Epic, UK's electronic health record system.

Results: Survey responses showed that primary care specialties and pain management doctors valued illicit substance use as the most important factor prior to prescribing opioids. Past opioid misuse was a top three consideration for all specialties outside of EM. EM attendings had KASPER as the most important, which was not seen anywhere else including EM residents. Contrarily, EM residents had substance use disorder (SUD) as the top consideration.

Conclusion: Across stratifications (specialty type, training level, opioid prescription frequency), the top considerations were past opioid misuse, illicit substance use, and SUD.

Supported by:

Primary Presenter / email: **Wilhoit, Brian /  
Professional Student (MD, PharmD, Dentistry, PT)  
SUD**

Presentation **108**

Abstract Title: **Mortality Rate of 30-Day Inpatient Tracheostomy Hemorrhage and Contributing Factors**

Author(s): J.C. McDaniel; M. J. Windon, Department of Otolaryngology-Head and Neck Surgery, U of Kentucky; A. A. Mangino, Department of Biostatistics, U of Kentucky; A. D. Mahairas, Department of Otolaryngology-Head and Neck Surgery, U of Kentucky

**Abstract:** A tracheostomy is a common procedure performed for long-term management of upper airway obstruction. Otolaryngologists are often consulted to obtain informed consent and perform tracheostomies for complex patients. Major tracheostomy complications are rare, with hemorrhage being the most common cause of tracheostomy-specific death. It is important to understand contributing factors to tracheostomy mortality to guide pre-operative counseling and contextualize the focus on hemorrhage in context of the patient's health. The goal of this study is to determine the 30-day tracheostomy mortality rate at a large tertiary academic center, as well as identify factors associated with 30-day mortality using retrospective data review of tracheostomy patients. All adult tracheostomy patients from 6/5/2021-12/31/2023 were included. The electronic health record was queried for potential contributing factors. Age, tracheostomy hemorrhage, gender, BMI, chronic obstructive pulmonary disease (COPD), coronary artery disease, chronic kidney disease, alcoholic & non-alcoholic liver disease, and sepsis were identified as significant factors included in the principal logistic regression. Significance was identified as  $p < 0.05$ .

The analysis found a significantly increased risk of 30-day post-operative mortality rate from tracheostomy associated with increased age, increased BMI, non-alcoholic liver disease, and sepsis. The analysis also found a significant decrease in 30-day post-operative mortality rate associated with COPD. Patients with increased age, increased BMI, non-alcoholic liver disease, and sepsis have an increased risk for 30-day post-operative mortality. This information can guide decision making of patients and physicians when considering tracheostomies. Further research should analyze why these risk factors are associated with an increased mortality rate.

Supported by: The project described was supported by the NIH National Center for Advancing Translational Sciences through grant number UL1TR001998. The content is solely the responsibility of the authors and does not necessarily represent the official views of the NIH.

Primary Presenter / email: **McDaniel, James** / [jcmc254@uky.edu](mailto:jcmc254@uky.edu)  
**Professional Student (MD, PharmD, Dentistry, PT)**  
**Translational Research/Science**  
**Surgery**

Presentation **109**

Abstract Title: **Underfunded but Unstoppable: The Paradox of Female Success in Plastic Surgery Research**

Author(s): Chloe Obert, U of Kentucky College of Medicine; Evan B. Lynch, Departments of Plastic and Reconstructive Surgery, U of Kentucky; Lesley Wong, Department of Plastic and Reconstructive Surgery, U of Kentucky

**Abstract:** Previous research established plastic surgery as the lowest-funded NIH specialty over ten years. Thus, the Plastic Surgery Foundation (PSF) has bridged the gap—offering research funding in pursuit of producing science worthy of NIH grants. A gender gap in research funding is well established, but outcome metrics from gender groups remains incompletely studied in plastic surgery. The goal of the current project was to interrogate the success metrics between male and female PSF awardees to ascertain whether male and female researchers have similar publication and future funding success.

This project retrospectively investigated fifteen years (2003-2017) of PSF grant recipients. Awardees were stratified by gender, then PI and mentor H-index scores, citation numbers, and future NIH funding was analyzed using Scopus, Altmetric and Mendeley readership scores, and NIH RePORTER tool.

Over fifteen years 442 PSF awards were analyzed, 25% of which were awarded to females. Female applicants who received funding had a higher percentage of multiple degrees than their male counterparts. Publications from female scientists had higher readership scores (Altmetric  $4.11 \pm 1.14$  vs.  $2.22 \pm 0.54$ ; Mendeley  $38.55 \pm 3.40$  vs.  $31.79 \pm 1.98$ ) despite similar institutional background, and investigator and senior mentor H-indices.

Funding in plastic surgery, like other specialties, is fraught with gender bias. This study's data suggests that despite fewer funding opportunities, female PSF awardees have greater impact on the field of plastic surgery with their work. Future studies are required to discern the full scope, including investigating characteristics of unsuccessful PSF applications and future NIH dollars obtained from PSF grants.

Supported by: No support funding required.

Primary Presenter / email: **Obert, Chloe** / Chloe.Obert@uky.edu  
**Professional Student (MD, PharmD, Dentistry, PT)**  
**Retrospective Observational Study**  
**Surgery**



Presentation **110**

Abstract Title: **Primary Treatment of Pediatric Cricopharyngeal Achalasia with Botulinum Toxin Injection: Case Report & Literature Review**

Author(s): L. T. Scharff, College of Medicine, University of Kentucky; A. Zaninovich, Department of Otolaryngology - Head & Neck Surgery, University of Kentucky; A. Smith, Department of Otolaryngology - Head & Neck Surgery, University of Kentucky

**Abstract:** Background: Pediatric cricopharyngeal achalasia (CPA) is a rare disorder characterized by incomplete relaxation of the upper esophageal sphincter. Treatment options include cricopharyngeal myotomy, dilation, and botox injection. While treatment with botox has been extensively reported in the adult literature, there are limited case series describing this treatment method in children.

Methods: We present a case of a 3-month-old patient presenting to our institution with CPA, describing the presentation, surgical procedure, and outcome. Data from this patient was consolidated with literature reports of botox as primary treatment for CPA.

Results: Our patient presented with dysphagia, aspiration and failure to thrive. Modified barium swallow (MBS) showed a prominent cricopharyngeus with aspiration of thin liquids. Esophagoscopy was performed and 20 units (4.3 u/kg) injected into the cricopharyngeus muscle. Follow up showed no aspiration on MBS. Patient remains symptom free at 9 months. Combining our data with cases in the literature, the most common presenting symptoms were dysphagia (55%) and aspiration (67%). Median age at presentation was 5 months. The average injection amount was 4.4 u/kg. 55% of patients required a second injection after the first, and one patient required a third injection. Median time to symptom recurrence was 3 months. 85% of patients achieved symptom resolution with botox injection(s) alone.

Conclusion: Botox injection into the cricopharyngeus is a reasonable option for primary treatment of CPA. In this young population, this may provide an option with lower morbidity than surgical options.

Supported by: UK Biostatistics Consulting and Interdisciplinary Research Collaboration Lab (Biostatistics CIRCL)

Primary Presenter / email: **Scharff, Louise** / ltsc232@uky.edu  
**Professional Student (MD, PharmD, Dentistry, PT)**  
**Clinical Research**  
**Surgery**

Presentation **111**

Abstract Title: **Diagnosis of Urothelial Carcinoma of the Primary Kidney Allograft Using a Fluorescence-Tagged Red Blood Cell Scan**

Author(s): A. Yadav, U of Kentucky College of Medicine; R. Bharadwaj, U of Kentucky College of Medicine; M. Gupta, Department of Transplant Surgery, U of Kentucky College of Medicine

**Abstract:** Case Presentation: We describe a 67-year-old female with a history of atrial fibrillation, chronic glomerulonephritis and chronic kidney disease who underwent living-related donor kidney transplantation in 1975. The kidney had lasted until 2017 as the patient had developed chronic graft rejection. From that point, she had begun hemodialysis. The patient was diagnosed with urothelial carcinoma of the bladder three years later during a cystoscopy to assess patient eligibility for new kidney transplantation. The patient underwent a second deceased-donor kidney transplantation yet still presented with gross hematuria. Consultation with nephrology and urology resulted in a cystoscopy performed which sampled all four ureters from the non-functional and transplanted kidneys followed by a fluorescence-tagged RBC scan. Pathology reports showed high-grade urothelial carcinoma of the older transplanted kidney.

Discussion: This patient's unique case of urothelial carcinoma of an older transplanted kidney is commonly reported but rarely occurs in most patients following transplantation. A tagged-RBC scan has not been reported in the literature to detect carcinoma in the allograft. The differential for gross hematuria following kidney transplantation must consider carcinoma as a factor as patients who have undergone a kidney transplantation are at risk of urothelial carcinoma of the graft.

Conclusion: It is important for providers treating transplant patients to conduct urinalysis tests frequently to monitor patient recovery post-surgery. Oftentimes, patients may not dysuria as a symptom but urinalysis can detect RBCs in the urine.

Supported by: None

Primary Presenter / email: **Yadav, Anika** / aaya223@uky.edu  
**Professional Student (MD, PharmD, Dentistry, PT)**  
**Clinical Research**  
**Surgery**

Presentation **112**

Abstract Title: **Hemiarthroplasty of Distal Humeral Fractures Using Latitude Implant: A Case Series**

Author(s): A. Yadav, U of Kentucky College of Medicine; S. Kamineni, Department of Orthopedic Surgery and Sports Medicine, U of Kentucky College of Medicine

**Abstract:** Introduction: A hemiarthroplasty is the preferred treatment for patients with a distal humeral fracture, whether chronic nonunion or acute, following trauma. The Latitude elbow prosthesis is FDA-approved for usage in total elbow arthroplasties but is used off-label for a hemiarthroplasty. We describe a series of 7 patients with either acute or chronic distal humerus fracture treated with a hemiarthroplasty.

Methods: We retrospectively identified 7 patients who had fractures of the distal humerus. Most patients had developed either an acute distal humerus fracture from an experienced trauma or progressed to a chronic nonunion because of poor treatment of their acute injury. All these patients were eligible candidates for hemiarthroplasty procedures based on age, past failed treatments of their fracture, and preservation of the radial and ulnar heads. Procedures were performed during a seven-year span from 2016 to 2023. Patients were followed up on a range from 1-8 months after surgery.

Results: Patients were asked about pain ratings at each visit and rated their pain on a scale from 0-10 as noted previously. The average pain score was 2.29 with a range of 0-7. All patients showed proper healing and positioning of the Latitude implant after hemiarthroplasty procedure. Radiographs before hemiarthroplasty showed distal humeral fractures located along the articular surface of the joint but fracture locations varied by patient. The average extension range of motion was 25 with a range of 15-35. The average flexion was 112.1 with a range of 85-130.

Conclusion: Treatment of a distal humerus fracture in active, elderly patient could benefit with a hemiarthroplasty. The Latitude elbow prosthesis can match the anatomic structure of the trochlea and capitellum of the humerus to allow for precise contact with the radial and ulnar heads. This results in improved patient outcomes including range of motion and pain scores.

Supported by: none

Primary Presenter / email: **Yadav, Anika / aaya223@uky.edu**  
**Professional Student (MD, PharmD, Dentistry, PT)**  
**Clinical Research**  
**Surgery**

Presentation **113**

Abstract Title: **A Preclinical Model for Investigating Sepsis-induced Complications in Spinal Cord Injury**

Author(s): K. Iyer, K. Zamiar, J. Patel, D. Patel, T. Garg, D. Winchester, Spinal Cord and Brain Injury Research Center and Department of Physiology, U of Kentucky;  
S. Rippy, Departments of Surgery and Physiology, U of Kentucky;  
T. Butterfield, Athletic Training and Clinical Nutrition, U of Kentucky;  
H. Saito, Departments of Surgery and Physiology, U of Kentucky;  
S. P. Patel, Spinal Cord and Brain Injury Research Center and Department of Physiology, U of Kentucky

**Abstract:** Sepsis is a major contributor to poor outcomes and increased mortality in spinal cord injury (SCI) patients, exacerbating secondary complications and worsening overall prognosis. Despite its clinical relevance, no experimental model currently exists to investigate long-term sepsis complications in SCI survivors. This study establishes a clinically relevant rodent model of sepsis survivor to address this gap. Rats were assigned to four groups: Sham, Sepsis, SCI, and SCI+Sepsis. SCI at T10 was created using an Infinite Horizon impactor (200 kDyn), sepsis was induced via intraperitoneal injection of cecal slurry (3mL) 15-min post-SCI. Supportive care, including fluid resuscitation and antibiotics, was administered 8-hours post-injury and continued twice a day for 5-days. Animals were monitored for survival, body weight, cytokine levels, and functional recovery. Locomotor function was assessed using BBB scoring, horizontal ladder tests, and in vivo muscle strength evaluations. ELISA was used to measure cytokine levels in blood and tissues at acute time points, while spinal cord histological analysis was performed at 12-weeks post-injury. Results demonstrated significant ( $p > 0.05$ ) bacteremia in the SCI+Sepsis group at 6-hours post-induction prior to antibiotic resuscitation, with lowest survival rates. SCI+Sepsis animals exhibited, greater muscle weakness, impaired locomotor recovery compared to SCI alone, alongside splenomegaly, reduced leg skeletal muscle mass, reduced spinal cord tissue sparing, and elevated cytokine levels in blood and spinal cord tissue were also evident. This experimental model effectively replicates sepsis-induced complications following SCI, offering a valuable platform for investigating underlying mechanisms and developing targeted therapies to enhance long-term outcomes in SCI patients.

Supported by: This project was supported by funding from the National Institutes of Health (NIH), including grant 1R21NS128749-01A1 (SP/HS) from the National Institute of Neurological Disorders and Stroke (NINDS) and grant P20 GM148326 from the National Institute of General Medical Sciences (NIGMS), U.S. Department of Health and Human Services.

Primary Presenter / email: **Iyer, Krithika** / kiy222@uky.edu  
**Postdoctoral Scholar/Fellow**  
**Basic Research**  
**Trauma**

Presentation **114**

Abstract Title: **Atypical Phenotypic Presentation in a Patient with Alpha-thalassemia X-linked Intellectual Disability (ATR-X) Syndrome**

Author(s): L. Bryant, College of Medicine, U of Kentucky; J. Bernard, College of Medicine, U of Kentucky; A Buchanan, Department of Urology, U of Kentucky

**Abstract:** Alpha-thalassemia X-linked intellectual disability (ATR-X) syndrome is a rare genetic disorder characterized by craniofacial abnormalities, hypotonia, seizures, developmental delay, intellectual disability, gastrointestinal dysfunction, and a spectrum of genital abnormalities. While craniofacial and developmental features are well-documented, this study focuses on the urologic manifestations of ATR-X syndrome. Genital abnormalities in ATR-X syndrome are typically mild, such as first-degree hypospadias and cryptorchidism, but more severe features like micropenis and ambiguous genitalia can occur with gonadal dysgenesis. We present the case of a newborn diagnosed with ATR-X syndrome exhibiting atypical and severe urologic phenotypic manifestations. The patient had ambiguous genitalia, including clitoromegaly versus micropenis, proximal hypospadias, and non-palpable testes, alongside other systemic abnormalities. Genetic analysis revealed a pathogenic hemizygous variant, ATRX c.7156C>T, p.Arg2386\*. The patient's clinical course was complicated by dysgenetic testes and ambiguous genitalia, requiring multidisciplinary management. This case highlights the complexity of managing severe genital abnormalities in ATR-X syndrome, particularly when the phenotype is not fully understood due to the rarity of specific genetic variants. The patient's condition underscores the need for individualized care plans and delayed surgical intervention to allow for further developmental assessment. This study confirms the consistency of key features in ATR-X syndrome and expands the known urologic phenotype, contributing valuable insights to the clinical understanding and management of this rare disorder.

Supported by:

Primary Presenter / email: **Bryant, Lindsay** / ltbr228@uky.edu  
**Professional Student (MD, PharmD, Dentistry, PT)**  
**Clinical Research**  
**Urology**

**Presentation 115**

Abstract Title: **Semantically-Augmented Graphic Libraries as Visual Standards for Anatomy and Phenotypes**

Author(s): M. D. Clarkson, Department of Biomedical Informatics, U of Kentucky; N. C. Perry, Institute for Biomedical Informatics, U of Kentucky; L. T. Detwiler, Institute for Biomedical Informatics, U of Kentucky

**Abstract:** We develop evidence-based, semantically-augmented graphic libraries that depict anatomy, phenotypes, and malformations. Our graphic libraries are intended to serve as visual standards that will clarify communication among researchers, clinicians, and patients and be used as visual assets for intelligent information systems. We envision our graphics being used in clinical diagnosis and documentation tools, information resources about syndromes, personalized patient education, and for the development of illustrated ontologies and terminologies. Our website at <https://endlessforms.info> provides our first graphics libraries and the Graphic Descriptor Ontology (GDO) that supports our semantics. Graphics are developed as scalable vector graphics (SVGs) and designed for use in web applications. The semantics not only describe the graphics themselves, but in combination with our web tools enable users to identify similar graphics in our libraries and navigate to selected external terminologies and ontologies representing phenotypes. Each graphic has a unique identifier in the form of an international resource identifier (IRI) which functions as a URL that links to an information page about the graphic. To assist software developers in using the graphics we are developing application programming interfaces (APIs) and demonstration web applications.

Supported by: NIH award R01DE030100

Primary Presenter / email: **Clarkson, Melissa** / [mclarkson@uky.edu](mailto:mclarkson@uky.edu)  
**Faculty**  
**AI/Machine Learning/Bioinformatics**

Presentation **116**

Abstract Title: **Annotation-Efficient Task Guidance for Medical Segment Anything**

Author(s): T. Ward, Department of Computer Science, U of Kentucky; A.-A.-Z. Imran, Department of Computer Science, U of Kentucky

**Abstract:** Medical image segmentation is a key task in the imaging workflow, influencing many image-based decisions. Traditional, fully-supervised segmentation models rely on large amounts of labeled training data, typically obtained through manual annotation, which can be an expensive, time-consuming, and error-prone process. This signals a need for accurate, automatic, and annotation-efficient methods of training these models. We propose SAM-Mix, a novel multitask learning framework for medical image segmentation that uses class activation maps produced by an auxiliary classifier to guide the predictions of the semi-supervised segmentation branch, which is based on the SAM framework. Experimental evaluations on the public LiTS dataset confirm the effectiveness of SAM-Mix for simultaneous classification and segmentation of the liver from abdominal computed tomography (CT) scans. When trained for 90% fewer epochs on only 50 labeled 2D slices, representing just 0.04% of the available labeled training data, SAM-Mix achieves a Dice improvement of 5.1% over the best baseline model. The generalization results for SAM-Mix are even more impressive, with the same model configuration yielding a 25.4% Dice improvement on a cross-domain segmentation task

Supported by:

Primary Presenter / email: **Ward, Tyler** / [tbwa233@uky.edu](mailto:tbwa233@uky.edu)  
**Graduate Student**  
**Basic Research**  
**AI/Machine Learning/Bioinformatics**

**Presentation 117**

Abstract Title: **Health Disparities in Kentucky's Appalachian Counties: Interactions Between Physician Availability, Poverty, and Region**

Author(s): E. Hargis, Department of Computer Science, U of Kentucky; H. Ballard, Department of Pediatrics, U of Kentucky; T. Thé, Department of Emergency Medicine, U of Kentucky

**Abstract:** This research addresses the critical roles that physician availability and poverty have in influencing the health outcomes of Kentuckians across different regions of the state. Using publicly available data from the Appalachian Regional Commission (2018), mortality rates for chronic diseases such as heart disease, cancer, COPD, stroke, and diabetes were compared between Kentucky's Appalachian and non-Appalachian counties. Primary care physician availability and household income below poverty were also included as crucial predictor variables for chronic disease mortality. Further, a variation of the Classification Tree machine-learning model was applied to predict whether a county should be classified as within the Appalachian region of Kentucky. Key findings from these analyses include that heart disease, cancer, and COPD mortality were all significantly higher in Appalachian counties. While household income below poverty had a significant main effect of increased mortality across all chronic diseases included in this study, the main effects and interaction effects of primary care physician availability and being in the Appalachian region were disease dependent. The machine learning model also achieved an 88.3% mean accuracy in classifying counties as Appalachian or not within the state. Additionally, nine counties were misclassified as not in Appalachia by the machine learning model, indicating that these counties are performing better than expected by virtue of their location alone. This research elucidates how variables like physician shortages, economic hardship, and geographic location can both independently contribute and interact together to shape the landscape of health disparities in Kentucky.

Supported by:

Primary Presenter / email: **Hargis, Emma** / emma.hargis@uky.edu  
**Graduate Student**  
**Health Equity Research**  
**AI/Machine Learning/Bioinformatics**



Presentation **118**

Abstract Title: **Mapping Microglial Heterogeneity in the Context of Alzheimer's Neuropathology**

Author(s): N. J. Norton, Sanders-Brown Center on Aging, U of Kentucky; K. Saito, Sanders-Brown Center on Aging, U of Kentucky; P. T. Nelson, Sanders-Brown Center on Aging, U of Kentucky; J. M. Morganti, PhD, Sanders-Brown Center on Aging, U of Kentucky

**Abstract:** Introduction: Multiple transcription states of microglia have been defined by single cell RNA sequencing within the context of AD neuropathology. Certain disease-associated phenotypes among microglia have been linked to acquired altered metabolism known as immunometabolism. Although there is increasing appreciation in the spatial distribution of microglia heterogeneity in the context of AD neuropathology, these models have yet to be applied to human post-mortem specimens.

Methods: 10um sectioned Fresh frozen human dorsolateral prefrontal cortex was mounted onto a Xenium slide and subsequently run using standardized Xenium assay. For the assay, we utilized a fully custom 480 probeset focused on microglial and neuroimmune transcripts, coupled with rate limiting proteins for cellular metabolism. Following Xenium, sections were stained using ThioS to label amyloid beta plaques and tau tangles. Using Warpy extension in Fiji, we co-registered DAPI stained images from the Xenium dataset with DAPI and ThioS stained images from human post mortem brain slices to align microglia to A $\beta$  plaques. Additionally, microglia underwent pathway alignment scoring and subsequent correlation analysis before undergoing distance-based microglial characterization. A heat map was then created to model predicting distance to plaque based on gene expression. Results: Our results demonstrate that microglial responses vary as a function of proximity to amyloid beta plaques and that marked heterogeneity is observed across this proximity with respect to metabolic associated expression. Conclusion: Spatial transcriptional profiling is a powerful tool to dissect cellular heterogeneity in the context of Alzheimer's disease and may indicate areas of susceptibility.

Supported by: NIH award: R01NS118558

Primary Presenter / email: **Norton, Noah** / noahnorton@upike.edu  
**Professional Student (MD, PharmD, Dentistry, PT)**  
**Clinical Research**  
**Informatics**

**Presentation 119**

Abstract Title: **Influence of Discharge Prescription Supply on All-cause Readmission Rates**

Author(s): M. Zeltner, Pharmacy Services, U of Kentucky; C. Rhudy, Pharmacy Services, U of Kentucky; K. Karrick, Pharmacy Services, U of Kentucky; R. Chadha, Internal Medicine, U of Kentucky

**Abstract:** Purpose/Background: Hospital readmissions are associated with increased morbidity, costs, and strain on hospital resources. Medication nonadherence is a multifactorial barrier that can contribute to preventable readmissions. Insufficient medication supply between discharge and follow-up visits can lead to nonadherence. This study aims to evaluate whether additional refills for newly prescribed anticoagulant and anticonvulsant medications can reduce readmission rates.

Methods: This retrospective cohort study focused on individuals admitted to UKHC between 07/01/2023 to 06/30/2024 and discharged with at least one new anticoagulant or anticonvulsant medication. Patients were categorized into "Insufficient" (<6 refills) and "Sufficient" (≥6 refills) cohorts and six-month all-cause readmission rates were compared.

Results: 3,876 encounters met inclusion criteria, with 458 (11.8%) receiving prescriptions with sufficient refills. The largest age group in the sufficient cohort was pediatric population (153, 33.4%) and ≥65 (1104, 32.3%) in the insufficient cohort. The proportion of patients experiencing at least one all-cause readmission at six-months was significantly lower in the sufficient cohort (36.5% vs. 45.1%, ARR 8.6%, RRR 19.1% p=0.0005). In the anticoagulant subgroup, no significant difference in readmission was observed (sufficient n=159, 44.7%; insufficient n=580, 46.8%; p=0.6013). However, there significantly fewer patients in the sufficient cohort of the anticonvulsant subgroup experienced all-cause readmissions (sufficient n=1,065 45.2%, insufficient n=97 32.3%; ARR 12.9%, RRR 28.5%; p<0.0001).

Conclusion: Sufficient medication supply on discharge prescriptions to bridge to follow-up visits may reduce all-cause hospital readmissions. Certain medication classes or special populations (e.g. anticonvulsants in pediatric populations) may receive greater benefit. Further research should evaluate effectiveness in other populations.

Supported by:

Primary Presenter / email: **Zeltner, Matthew** / matthew.zeltner@uky.edu  
**Staff**  
**Translational Research/Science**  
**Informatics**

Presentation **120**

Abstract Title: **Autoimmune Encephalitis Mimicking UTI Delirium in an Elderly Patient**

Author(s): C. Ryan, Medical Student, U of Kentucky; L. Katirji M.D., Department of Emergency Medicine, U of Kentucky.

**Abstract:** A 65-year-old female presented to the emergency department (ED) for worsening behavioral and neurological changes. Her worsening symptoms are in the setting of 3 months of progressive, subtle behavior changes noticed by family to which she was admitted to a psychiatric facility for concerns of possible psychiatric manifestation. On initial presentation, the patient was found to have a positive urinalysis and was discharged back to the psych facility. However, she returned to the ED a week later with further exacerbation of symptoms. She was admitted to the hospital with a thorough neurological workup. An extensive differential diagnosis included a brief psychotic episode, vascular dementia, zoonotic infection, prion disease, viral meningitis, and autoimmune encephalitis. With negative cerebrospinal fluid (CSF) studies for common infectious causes and positive antibodies to GABA-A-B, the diagnosis of autoimmune encephalitis was concluded. The patient has had remarkable improvement of her symptoms throughout her recovery course. Interestingly, she has total retrograde amnesia in the month prior to her symptoms and the entirety of her disease course. This case highlights the importance of maintaining a broad differential and considering autoimmune encephalitis, even in the absence of typical findings in initial CSF studies, when faced with unexplained neurological and psychiatric symptoms. Timely recognition and diagnosis are crucial for appropriate management, including immunotherapy, which can significantly improve outcomes in patients with this condition.

Supported by:

Primary Presenter / email: **Ryan, Colin** / colin.ryan@uky.edu  
**Professional Student (MD, PharmD, Dentistry, PT)**  
**Case Report**  
**Behavioral Research**

**Presentation 121**

**Abstract Title: Identifying Novel Strategies for HIV PrEP Care Implementation: Qualitative Findings Among Rural Syringe Services Program**

**Author(s):** A.L. Burton, Depts. of Behavioral Science and College of Medicine, U of Kentucky; T.L. Scott, College of Medicine, U of Kentucky; C. Evans, College of Medicine, U of Kentucky; J. Gulley, Clark County Health Dept., Winchester, KY; J. Fraley, Kentucky River District Health Dept., Beattyville, KY; J. Collins, Dept. of Internal Medicine, U of Kentucky; N. Van Sickels, Dept. of Internal Medicine, U of Kentucky; H.L. Surratt, Depts. of Behavioral Science and College of Medicine, U of Kentucky

**Abstract:** Background: While trends in HIV incidence have declined overall, disease burden remains high among people who inject drugs (PWID). Pre-exposure prophylaxis (PrEP) has been a highly successful tool in HIV prevention; however, uptake among PWID is minimal compared to need. To better facilitate integration of PrEP care, it is essential to understand the population's needs and identify potential barriers throughout the program design process.

**Objectives:** In collaboration with the CCHD and KRHD harm reduction communities, the information gathered in Aim 1 will guide decisions to optimize the content, delivery, and implementation strategies for the final intervention protocol.

**Methods:** This study analyzed formative qualitative interview data collected to inform the development of the new PrEP intervention to be tested in a pilot randomized trial, known as: PROTECT -- PrEP Optimization through Telehealth Care and Treatment.

We conducted thirty-five semi-structured interviews among SSP clients and community stakeholders (eighteen clients and seventeen stakeholders), both in-person and via Zoom. Participants were asked questions relative to anticipated barriers and patient preferences in PrEP care. To optimize time to implementation, rapid qualitative assessment (RQA) was utilized to code and identify themes regarding potential barriers and recommendations. Results: The most frequently reported barriers to care included transportation (71%), housing instability (40%) and quality and access to local HIV care (20%). Clients expressed strong preferences for same-day rapid-start PrEP care, peer-delivered PrEP education, and access to long-acting injectable PrEP.

**Conclusion:** Low-threshold telehealth services are a promising strategy in translating PrEP care to PWID populations.

**Supported by:** This work is supported by the National Center for Research Resources and the National Center for Advancing Translational Sciences, National Institutes of Health, through Grant UL1TR001998.

**Primary Presenter / email:** **Burton, Abby** / [abby.burton@uky.edu](mailto:abby.burton@uky.edu)  
**Staff**  
**Dissemination & Implementation Research**  
**Behavioral Research**

**Presentation 122**

Abstract Title: **Examining the Relationship Between Cognitive Auditory Processing and Sex Hormones**

Author(s): T. A. Cline, Department of Otolaryngology – Head and Neck Surgery, U of Kentucky; M. L. Bush, Department of Otolaryngology – Head and Neck Surgery, U of Kentucky; A. Mangino, Department of Biostatistics, U of Kentucky; D. D. Beshear, Department of Internal Medicine, U of Kentucky; J. B. Shinn, Department of Otolaryngology – Head and Neck Surgery, U of Kentucky

**Abstract:** Sex hormones have a key role in central auditory nervous system (CANS) function. Post-menopausal females often present to audiology clinics with complaints of difficulty hearing in noise. However, these individuals frequently have normal hearing on audiometry. Previous studies using the auditory brainstem response (ABR) have found that post-menopausal females demonstrated longer response latencies compared to premenopausal females, suggesting that sound does not transmit through the CANS as efficiently. The literature focused on sex hormones and the CANS relies mainly on objective ABR measures. However, the ABR only reflects function through the brainstem. The existing research does not adequately address the concerns of clinical populations. The study purpose was to examine the relationship between central auditory function and sex hormones as it relates to the primary complaint of difficulty hearing in noise.

This was a prospective, cross-sectional study. Twenty premenopausal and fourteen post-menopausal females completed self-perception listening questionnaires and audiologic assessment to verify normal hearing.

Participants also underwent venipuncture, a clinical central auditory processing test battery and the auditory P300 assessment in quiet and background noise.

Results demonstrated that premenopausal females and higher levels of estradiol and progesterone are associated with better listening abilities in noise and utilization of spatial cues. Higher scores on the listening questionnaires were associated with better use of talker and spatial cues. Hormone concentrations nor menopausal status were correlated with the P300 response. Results suggest that sex hormones and menopausal status may influence spatial listening and the ability to use auditory spatial cues in complex environments.

Supported by: CCTS Small Grant mechanism

Primary Presenter / email: **Cline, Trey** / taclin2@uky.edu  
**Graduate Student**  
**Clinical Research**  
**Behavioral Research**

**Presentation 123**

Abstract Title: **DOI and Saline Injection into Rat Claustrum Reproduce Wet Dog Shake with Potential Anterior Cingulate Cortex Involvement**

Author(s): J. A. D'Orazio, College of Medicine, U of Kentucky; N. S. Tavakoli, Department of Neuroscience, U of Kentucky; T. L. Anderson, Department of Neuroscience, U of Kentucky; P. I. Ortinski, Department of Neuroscience, U of Kentucky

**Abstract:** Clinical trials have supported the use of serotonin (5-HT) agonists in the treatment of multiple psychiatric disorders, placing an importance in understanding their therapeutic and adverse effects. In rodents, systemic administration of a 5-HT agonist such as synthetic hallucinogen 2, 5-Dimethoxy-4-iodoamphetamine (DOI), induces "wet dog shakes (WDS)" a rapid, twitching movement mediated through an unknown motor circuit. Our previous work identified a population of 5-HT receptors in the rat claustrum, suggesting that this structure may be involved in WDS. In this study, we test the hypothesis that the claustrum may be an integral component to the WDS phenotype. We quantified WDS following intraperitoneal (systemic) and bilateral claustrum DOI administration. Our analysis demonstrated that DOI microinjection directly into the claustrum reproduced the WDS behavior that occurred following systemic administration. Surprisingly, we found a comparable number of shakes in control animals that received saline injections into the claustrum. Additionally, both saline and DOI claustrum injections led to an increase in WDS following grooming behavior compared to systemic controls. Interestingly, fiber photometry data indicate an increase in transient neuronal activity in the anterior cingulate cortex (ACC) during WDS after both saline and DOI claustrum microinjection, hinting that the ACC might aid to coordinate this response via a non-serotonergic mechanism. Our findings suggest that the claustrum does not directly mediate WDS through serotonin channels but may be involved in the neural circuitry underlying WDS via the ACC. Understanding this pathway may inform efforts to mitigate adverse effects of serotonergic agents and improve patient experience.

Supported by: The Professional Student Mentored Research Fellowship (PSMRF) Project is supported by the National Center for Advancing Translational Sciences through Grant UL1TR001998, UK HealthCare and the University of Kentucky College of Medicine. The content is solely the responsibility of the authors and does not necessarily represent the official views of the NIH.

Primary Presenter / email: **D'Orazio, Julia** / jdo59@uky.edu  
**Professional Student (MD, PharmD, Dentistry, PT)**  
**Basic Research**  
**Behavioral Research**

Presentation 124

Abstract Title: **Exploring the Effects of Mixed Reality Game Training on Balance and Motor Function in Stroke Patients**

Author(s): C. E. Wayer, Department of Neuroscience, U of Kentucky; A. C. Glueck, Department of Neurology, U of Kentucky

**Abstract:** Motor function and balance impairment are commonly reported deficits following stroke, often leaving individuals with lifelong deficits. In 2021, it was reported that over 11,000 Kentucky residents were admitted for inpatient treatment for stroke and transient ischemic attack (TIA), otherwise known as mini-stroke. In combination with the prevalence of stroke, stroke treatment, prevention, and most relevant to this study, on-going rehabilitation methods account for great strain on healthcare systems' resources and as well as burden on patients and their support systems dealing with effects. In a highly technological world, mixed reality (MR) may provide a novel solution for motor function and balance recovery in patients that can not only aid their personal outcomes, but also ease the strain on the healthcare system long-term. A prior mixed reality game training study in our lab demonstrated significant balance improvements in non-clinical, healthy participants, suggesting that there could be similar benefits for individuals with balance impairment following stroke. Our case series with 2 stroke patients explored whether the MR game training provided could be used to aid in balance and motor function recovery. Following 12, one-hour sessions of mixed reality training participants demonstrated significant improvement in balance (determined both through qualitative and quantitative means). Finally, these improvements were stable across a 90-day washout/follow-up window. While the results of this case series are promising, a larger sample is needed before drawing definitive conclusions regarding the effectiveness of using MR as a balance rehabilitation aid following stroke.

Supported by: NPRA Pilot Award

Primary Presenter / email: **Wayer, Caroline** / cewa259@uky.edu  
**Undergraduate Student**  
**Clinical Trial**  
**Behavioral Research**

Presentation **125**

Abstract Title: **Investigating The Feasibility of Virtual Reality Singing Program in Individuals With Mild Cognitive Impairment**

Author(s): C. E. Willhoite, Department of Psychology U of Kentucky; A. C. Glueck, Department of Neurology U of Kentucky College of Medicine

**Abstract:** Alzheimer's Disease (AD) and Alzheimer's Disease-related dementias (ADRD) cases are on the rise and by 2050 are anticipated to increase to 13 million in the United States. Loneliness and isolation have been found to be a major risk factor for AD and ADRD. Currently, there are an estimated 800,000 Americans diagnosed with AD or ADRD who are living alone. Therefore, interventions that can help augment the feeling of loneliness could be beneficial for AD and ADRD populations. Another intervention that has demonstrated efficacy in combating the symptoms associated with AD and ADRD is music therapy. Our group has teamed up with a local virtual reality start-up company who has created a social singing club that can be delivered via a virtual reality headset. In addition to providing music therapy-like opportunities to seniors, this program also has the capability of bridging geographic distances to bring people together. This program was created based on the feedback obtained via two focus groups with medical professionals with expertise in age-related cognitive impairment that our team hosted. We are currently conducting demonstrations of this singing club program in seniors with age-related cognitive decline and their study partner to determine feasibility and usability in this population. This study involves mixed method design. To date four pairs have completed the demonstrations and provided invaluable feedback that will go to further refining the singing program. Overall, feedback has been extremely positive.

Supported by: NIA SBIR/STTR 1000305715

Primary Presenter / email: **Willhoite, Carolene** / cwi306@uky.edu  
**Undergraduate Student**  
**Clinical Research**  
**Behavioral Research**



**Presentation 126**

Abstract Title: **Communication Impairment in Adults with Dementia Associated with Sensory Processing Abnormalities and Caregiver Burden**

Author(s): N. L. Wolff, Department of Behavioral Science, U of Kentucky; C. I. Benzarti, Department of Behavioral Science, U of Kentucky; L. Henley, HealthPRO Heritage; A. L. Stauffer, Sanders-Brown Center on Aging, U of Kentucky; B. G. Carter, Department of Medical Education, U of Kentucky; E. K. Rhodus, Sanders-Brown Center on Aging, Department of Behavioral Science, U of Kentucky

**Abstract:** Background: Declining communication is a hallmark of Alzheimer's disease and related dementias (ADRD). Communication impairment can impact relationship quality and complicate care tasks. We hypothesized communication impairment would be positively correlated with elevated caregiver burden and sensory processing abnormalities in older adults with ADRD.

Methods: Drawing data from a non-pharmacological randomized controlled trial aimed at behavior modification in ADRD, we conducted secondary data analysis using Pearson correlation to assess relationships among communication impairment as indicated on the Clinical Dementia Rating Scale (CDR), caregiver burden (using the Zarit Burden Inventory), and sensory processing abnormalities (using the Adult Sensory Profile). ADRD was confirmed by CDR 1+ and caregiver report. Demographic data were processed using descriptive statistical analysis.

Results: Data were analyzed from 19 participants with ADRD. Participants had a  $\bar{x}$  Standard Global CDR of 1.625 and all had functioning sensory acuity ( $\bar{x}$  age=78.21, SD=10.15; 57.9% female). Spouses were the most frequent care partners (52.6%;  $\bar{x}$  age=62.32, SD=11.56; 84.2% female). Communication impairment was significantly positively correlated with caregiver burden ( $r = 0.59$ ,  $p=0.007$ ). Additionally, communication impairment was significantly positively correlated with sensory processing abnormalities in the domains of sensory sensitivity ( $r=0.64$ ,  $p=0.004$ ) and sensory avoiding ( $r=0.49$ ,  $p=0.037$ ).

Conclusion: Additional exploration is warranted to determine causal mechanisms between sensory processing abnormalities and communication impairment in ADRD, which may inform future care strategies.

Supported by: This research was supported by the National Institutes of Health (NIA K23AG075262, NINDS 5R25NS130963-02)

Primary Presenter / email: **Wolff, Nancy** / nancy.wolff@uky.edu  
**Other**  
**Clinical Research**  
**Behavioral Research**

**Presentation 127**

Abstract Title: **A Case and Literature Review of Fat Emboli Syndrome (FES) Following G-CSF for Hematological Malignancies.**

Author(s): M. K. Khashimov, College of Medicine, University of Kentucky; C. M. Lockstadt, Department of Hospital Medicine, University of Kentucky; G. P. Monohan, Department of Hematology, University of Kentucky

**Abstract:** FES is a rare complication of G-CSF with chemotherapy for hematological malignancies. Typically, fat emboli arise due to orthopedic trauma and present with petechial rash, respiratory distress, and neurologic changes. Causes of non-traumatic FES include inflammatory reactions and bone marrow necrosis from G-CSF. We present a case and literature review.

A 56 yo man presented with lethargy, altered mentation, ataxia, and hypoxia necessitating intubation. History revealed DLBCL with relapse treated with chemotherapy, orchiectomy, radiation and peg-filgrastim. Labs showed CRP 219, ferritin 51297, and platelets 8. He received platelet transfusions. MRI revealed CNS lymphoma improvement with diffuse miliary foci, concerning for diffuse embolic disease. Ultrasound revealed left arm DVT. Echocardiogram, infectious and autoimmune panels, and electroencephalogram were negative. Tracheostomy was required. He improved, however had persistent paraparesis. Lymphoma treatment suspended. Supportive care was initiated.

He discharged to rehabilitation where tracheostomy was decannulated. Later his neurological symptoms worsened. MRI revealed CNS lymphoma progression but emboli improvement. Somnolence progressed and family decided to pursue comfort care and he expired.

There are four other hematologic malignancy FES case reports following G-CSF, with most in their fifties and average onset of FES 12 days after G-CSF. Malignancies included DLBCL, T-ALL and B-cell lymphoma. All patients were on cycle 1-2 of chemotherapy using different regimens. Two were proven by autopsy and two with imaging. All had bone pain and respiratory distress. Two patients recovered. We emphasize the importance of considering FES in patients with hematologic malignancy undergoing treatment since it can progress to significant respiratory distress.

Supported by:

Primary Presenter / email: **Khashimov, Mardan / mnkh223@uky.edu**  
**Professional Student (MD, PharmD, Dentistry, PT)**  
**Case report**  
**Cancer**

**Presentation 128**

Abstract Title: **Leveraging Fucosyltransferase Inhibition to Impede MYCN-amplified Neuroblastoma Tumorigenesis**

Author(s): M. D. Buoncristiani, Department of Surgery, UK; L. Bryant, Surgery, UK; B. Zhu, Surgery, UK; M. Pitts, Surgery, UK; C. Shedlock, Department of Biochemistry and Molecular Biology, UF; R. Ribas, Biochemistry and Molecular Biology, UF; M. Gentry, Biochemistry and Molecular Biology, UF; N. Shelman, UK, Department of Pathology; D. Allison, UK, Pathology; B. M. Evers, Surgery and Markey Cancer Center, UK; R. Sun, Biochemistry and Molecular Biology, UF; E. J. Rellinger, Surgery and Markey Cancer Center

**Abstract:** Despite aggressive multimodal treatment, high-risk neuroblastomas (NBs) have less than 50% overall survival, highlighting the need to develop new therapeutics. Glycosylation is an underappreciated mediator of cancer progression. Employing spatial metabolomics, we have reported enrichment of core fucosylated glycans in MYCN-amplified human NB tissues. 2-fluorofucose (2-FF) is an orally bioavailable small-molecule inhibitor of fucosyltransferases. Herein, we hypothesized that small-molecule fucosyltransferase blockade would impede MYCN-amplified NB tumor growth.

Kaplan-Meier analysis was performed to determine whether specific fucosyltransferase expression was associated with overall survival. Core fucosylated glycan abundance was measured via western blotting, ELISA, and flow cytometry utilizing Aleuria aurantia lectin (AAL). Subcutaneous tumor formation using MYCN-amplified BE(2)-C cells was our measure of in vivo tumorigenesis. Mice with established BE(2)-C tumors were randomized to receive 2-FF supplemented water or vehicle control.

Elevated expression of fucosyltransferase 8 (FUT8;  $\text{bonf } P = 5.95 \times 10^{-3}$ ) is associated with poor patient survival. 2-FF blocks NB core fucosylation, cell growth, and adherence in vitro. Oral 2-FF administration blocks core fucosylation in vivo and impedes established tumor progression ( $< 0.05$ ). Histologic analysis revealed enhanced induction of cell necrosis (51% vs. 12%;  $p < 0.0001$ ) within treated tumor samples.

Elevated FUT8 expression is associated with poor overall survival in human NB. Small molecule inhibition with 2-FF blocks NB cell growth and adherence in vitro and abrogates tumor growth via induction of cancer cell death in vivo. These critical findings highlight fucosyltransferase blockade as a novel metabolic vulnerability for exploitation in developing treatment paradigms for high-risk NBs.

Supported by: NIH 5P20GM121327-09; Dick Vitale Pediatric Cancer Research Fund (V2023-026); PSMRF NIH CTSA grant (UL1TR001998)

Primary Presenter / email: **Buoncristiani, Michael** / michael.buoncristiani@uky.edu  
**Professional Student (MD, PharmD, Dentistry, PT)**  
**Basic Research**  
**Cancer**

**Presentation 129**

**Abstract Title: Efficacy of Transarterial Bland Embolization with Concurrent Everolimus for Hepatic Metastatic Neuroendocrine Tumors**

**Author(s):** W. Denton, M.A., College of Medicine, University of Kentucky; A. Elsayed, M.D., Department of Radiology, University of Kentucky; N. Meredith, College of Medicine, University of Kentucky; B. Mischen, M.D., Department of Radiology, University of Kentucky; G. Gabriel, M.D., Department of Interventional Radiology, University of Kentucky; L. B. Anthony, M.D., Markey Cancer Center, University of Kentucky; R. El Khouli, M.D., Department of Radiology, University of Kentucky

**Abstract:** Purpose: Liver-directed therapies are recommended for progressive or symptomatic NET liver metastases, with options including bland embolization (TAE), chemoembolization (TACE), or radioembolization (TARE). Median hepatic progression-free survival (hPFS) is reported at 11 months for TAE, 20 months for TACE1, and 18 months for TARE.2 The RADIANT-3 & 4 trials found everolimus results in a median progression-free survival of 11 months. Everolimus is typically held 2-4 weeks before and after embolization to minimize toxicity. We hypothesize concurrent use of everolimus with TAE (EveroEmbo) will result in prolonged local tumor control compared to either therapy alone.

**Material and methods:** We reviewed all patients who underwent EveroEmbo between 9/2016 and 2/2019 at the University of Kentucky. Inclusion criteria included at least one month of everolimus before embolization. For median hPFS analysis, only patients with > 12 months post-TAE imaging were included. Independent radiologists reviewed baseline and post-therapy studies, assessing hepatic-specific treatment response according to RECIST 1.1.

**Results:** 65 EveroEmbo procedures in 38 patients were performed. Only 40 procedures had sufficient post-procedural imaging to apply RECIST 1.1, returning 82.5% with partial response, 17.5% with stable disease, and no disease progression. Tumor burden decreased by -46.3% + 18.3% (-18% to -97%). Among 65 procedures, 23 had > 12 months of follow-up imaging, with a median hPFS of 27 months.

**Conclusion:**Concurrent EveroEmbo shows promise for local hepatic disease control with a median hPFS of 27 months, exceeding TAE, radioembolization, and potentially TACE. Longer follow-up is necessary to determine the true median hPFS and overall survival.

Supported by: NIH CTSA grant (UL1TR001998)

Primary Presenter / email: **Denton, William** / wdde225@uky.edu  
**Professional Student (MD, PharmD, Dentistry, PT)**  
**Clinical Research**  
**Cancer**

**Presentation 130**

Abstract Title: **Everolimus with Bland Embolization: Impact on Survival and Hospital Length of Stay in Hepatic Neuroendocrine Metastasis**

Author(s): W. Denton, M.A., College of Medicine, University of Kentucky; N. Meredith, College of Medicine, University of Kentucky; G. Gabriel, M.D., Department of Interventional Radiology, University of Kentucky

**Abstract:** Background: Bland embolization for hepatic metastasis is a standard treatment for metastatic neuroendocrine tumors. Everolimus, an mTOR inhibitor, is traditionally withheld before embolization to reduce hepatic toxicity. However, concurrent treatment with bland embolization and everolimus may create a more durable response. This study evaluates the safety of combining everolimus with embolization compared to embolization alone.

Methods: A retrospective cohort analysis was conducted on patients who underwent embolization with and without everolimus. Data included demographics, MELD scores, hospital stay length, and post-embolization syndrome incidence. Safety outcomes were measured through overall mortality rates and hospital stay length post-procedure as an indicator of post-embolization syndrome severity.

Results: The study included 184 embolizations in 100 patients: 145 with everolimus and 39 without. The average age at embolization was 56.0±12.0 years for the everolimus group and 56.4±14.1 years for the control group. Overall survival was 41.0±24.6 months in the everolimus group and 31.0±25.5 months in the control, a statistically significant difference (p=0.03). Statistical significance was not achieved in the Kaplan-Meier analysis, likely due to follow-up loss and small cohort size. Hospital stay length showed no significant difference, averaging 1.3±1.0 days for the everolimus group and 1.6±1.1 days for the control group.

Conclusion: Combining everolimus with bland embolization for hepatic neuroendocrine tumor metastasis is as safe and effective as embolization alone. No significant difference was observed in hospital stay length. A statistically significant difference was found for overall survival, with combined treatment showing longer survival. Further studies are needed to fully elucidate this finding.

Supported by: NIH CTSA grant (UL1TR001998)

Primary Presenter / email: **Denton, William** / wde225@uky.edu  
**Professional Student (MD, PharmD, Dentistry, PT)**  
**Clinical Research**  
**Cancer**

Presentation **131**

Abstract Title: **The Effect of FASN Inhibition on mTOR Malonylation in a Colorectal Cancer Model**

Author(s): K. Hedinger, College of Medicine, U of Kentucky; M. Skau, Department of Molecular and Cellular Biochemistry, U of Kentucky; T. Gao, Department of Molecular and Cellular Biochemistry, U of Kentucky

**Abstract:** Colorectal cancer is the third highest diagnosed cancer in the United States with the second highest mortality rate. Usually seen as a cancer of aging, recent evidence has shown an increasing incidence rate in children due to rising rates of childhood obesity and a significant risk of developing colorectal cancer from a high BMI. This connection has directed our study to lipogenesis and its connection to cell growth and proliferation. Neoplasms synthesize up to 95% of fatty acids de novo through Fatty Acid Synthase (FASN). When FASN is inhibited, levels of acetyl-CoA and malonyl-CoA rise within the cytoplasm. Mechanistic Target of Rapamycin (mTOR), a key regulator of cell growth and proliferation, possesses a malonylation site that reduces its kinase activity on downstream targets when induced. Upon FASN inhibition, we observed a rise in malonylated proteins, specifically mTOR, and an increase in activation of upstream targets of FASN. When mTOR was malonylated, we observed a decrease in phosphorylation of p70S6K, which is a downstream target of mTOR-mediated cellular signaling. The reduced phosphorylation of p70S6K decreased its negative feedback on AKT phosphorylation, which resulted in an observed increase in AKT phosphorylation during our study. By inhibiting FASN, mTOR malonylation increases and inhibits the PI3K-AKT-mTOR mechanism in colorectal cancer. These results suggest that FASN inhibition and increased malonylation of mTOR could inhibit cellular growth and proliferation within colorectal cancer cells, offering a mechanistic target for cancer therapeutics.

Supported by: NIH award: R01CA284532 and PSMRF funding from NIH CTSA grant (UL1TR001998)

Primary Presenter / email: **Hedinger, Kyle** / kyle.hedinger@gmail.com  
**Professional Student (MD, PharmD, Dentistry, PT)**  
**Basic Research**  
**Cancer**

**Presentation 132**

Abstract Title: **Recurrence Detection of Stage IIB to IIID Cutaneous Melanoma: Is PET Superior to Other Imaging?**

Author(s): A. Reagan, Department of General Surgery, U of Kentucky; H. McDonald, Department of General Surgery, U of Kentucky; S. Junkins, U of Kentucky College of Medicine; M. Anderson, Department of General Surgery, U of Kentucky; E. Burke, Department of Surgical Oncology, U of Kentucky

**Abstract:** Introduction: With the development of multiple effective systemic therapies for melanoma, timely detection of recurrent melanoma allows for earlier initiation of treatment. NCCN guidelines for stage IIB-IIID melanoma surveillance recommend imaging consideration at least annually for 5 years. However, surveillance imaging is at the provider's discretion and may include US, CT, PET, or MRI. Data suggests that surveillance with PET may lead to earlier detection of melanoma recurrence.

Methods: We performed a retrospective review of the electronic medical record for all patients diagnosed with stage IIB-IIID cutaneous melanoma at our institution between July 2017 to January 2022. Demographic, clinicopathologic, surveillance, and melanoma recurrence data was collected and analyzed. P-value < 0.05 was considered significant.

Results: Out of 106 patients, 64 (60.4%) had surveillance imaging within one year of resection (26.6% stage IIB-IIC, 85.2% stage III). A total of 25 patients (23.6%) had a melanoma recurrence; 40% were detected by surveillance PET imaging, 24% by surveillance CT imaging, 28% by clinical exam, and 12% by patient history and subsequent diagnostic imaging. One recurrence in the stage IIB-IIC group was detected by PET compared to 9 in the stage III group ( $p = 0.01$ ). Average time to recurrence was 14.2 months with PET surveillance and 20.3 months without PET surveillance ( $p = 0.23$ ).

Conclusions: PET scan detected the majority of melanoma recurrences at our institution. Further, patients who had regular surveillance with PET scan had earlier time to recurrence detection. Further multicenter studies are still needed to evaluate these trends.

Supported by: n/a

Primary Presenter / email: **Junkins, Sadie / smju228@uky.edu**  
**Professional Student (MD, PharmD, Dentistry, PT)**  
**Clinical Research**  
**Cancer**

**Presentation 133**

**Abstract Title: Tobacco Use, Secondhand Smoke Exposure and Infant Feeding Practices  
Among Rural Kentucky Mothers**

Author(s): K. Ashford, College of Nursing, U of Kentucky; R. Ray, Department of Behavioral Science, U of Kentucky

**Abstract:** Introduction: Women in rural communities have higher rates of tobacco use and secondhand smoke (SHS) exposure as well as lower rates of breastfeeding initiation and duration compared to their urban counterparts. Policy outcomes research shows pregnant women living in communities with strong smoke-free laws have lower rates of preterm birth. Research is lacking on the association of tobacco use, SHS exposure, smoke-free laws and infant feeding status in rural communities.

Purpose: To examine tobacco use, SHS exposure and infant feeding practices in mothers living in rural communities.

Methods: This feasibility study used a cross-sectional retrospective design and purposive cluster sampling with stratification by strength of municipal smoke-free laws and tobacco exposure status. Women between 18-45 years of age currently residing in one of the six identified rural Kentucky counties (three counties with comprehensive smoke-free ordinances including smoke-free workplaces and enclosed public places and three counties without smoke-free ordinances), who have given birth to a live infant within the past two years were eligible. Measures included demographics; infant feeding practices; tobacco use; SHS exposure; lung cancer screening and worry; depression; anxiety; and alcohol and substance abuse.

Results: All participants (n=13) were white and non-Hispanic. Most participants resided in counties without smoke-free ordinances (61%) and over half of the participants (54%) reported tobacco exposure during the first year of their child's life. In bivariate analyses, the strength of municipal smoke-free ordinance was not associated with breastfeeding duration.

Discussion: Future plans include a mixed methods study with expanded recruitment to additional rural counties.

Supported by: This project is supported by CARERC through Grant 6T42OH010278. Its contents are solely the responsibility of the author and do not necessarily represent the official views of the NIOSH/CDC. Additionally, this project is supported by T32 CA261786 from the National Cancer Institute.

Primary Presenter / email: **Ray, Robin / robin.ray@uky.edu**  
**Postdoctoral Scholar/Fellow**  
**Community Research**  
**Cancer**



Presentation 134

Abstract Title: **Clearance of Photoproducts through cAMP Induction Following UV Exposure**

Author(s): M. R. Wasef, College of Medicine, U of Kentucky; H. Pu, The Markey Cancer Center, College of Medicine, University of Kentucky; N. Holcomb, The Markey Cancer Center, College of Medicine, University of Kentucky; B. Hallilovic The Markey Cancer Center, College of Medicine, University of Kentucky; J.A. D'Orazio, Department of Pediatrics, College of Medicine, The Markey Cancer Center, U of Kentucky

**Abstract:** Melanoma's are the leading cause of cancer deaths in women in their early twenties and have been on the rise in recent years. This may be due to increased UV exposure, as might occur through recreational tanning. UV signature mutations in melanoma isolates incriminate UV as a critical driver of melanoma in humans. Previous studies established that topical induction of cAMP prior to UV exposure enhances clearance of UV-generated DNA photoproducts which, if unrepaired, can be mutagenic (Bautista et.al, 2021). Cyclic AMP is signaled when melanocyte-stimulating hormone (MSH), engages the melanocortin 1 receptor (MC1R), a G protein-coupled receptor. Forskolin activates adenylyl cyclase, mimicking MSH-MC1R interactions by increasing intracellular cAMP. It's role post-UV exposure has yet to be studied with respect to UV damage repair.

An A375 melanoma cell line was treated with forskolin and a DMSO vehicle control alongside untreated and unexposed controls. The impact of post-UV application of treatment was analyzed for efficacy in repairing DNA damage using SouthWestern blotting to quantify UV photoproducts.

Samples treated with forskolin post-exposure exhibited accelerated clearance of UV-induced cyclopyrimidine dimers, demonstrating fewer DNA lesions compared to the DMSO control. By testing induction of cAMP in melanoma cell lines, we conclude that the application of forskolin enhances DNA repair when administered after UV exposure. Translationally, this has implications for melanoma prevention by enhancing repair of UV damage in the skin after sun exposure.

Supported by: Biostatistics and Bioinformatics, Flow Cytometry and Immune Monitoring and Translational Pathology, Cancer Research and Informatics, Oncogenomics Shared Resources of the University of Kentucky Markey Cancer Center, Joy Wills Endowment for Childhood Cancer Research, the DanceBlue Philanthropic Organization, the Kentucky Pediatric Cancer Research Trust Fund; NIH CTSA grant

Primary Presenter / email: **Wasef, Mary** / mrwa269@uky.edu  
**Graduate Student**  
**Basic Research**  
**Cancer**

**Presentation 135**

Abstract Title: **ECMO as a Rescue Measure for Post Cardiomy Circulatory Collapse: A Single Center Experience**

Author(s): K.O. Conley, U of Kentucky; S.P. Saha, Department of Surgery, Division of Cardiothoracic Surgery, U of Kentucky

**Abstract:** Background: Nearly 500,000 open-heart operations are performed annually in the United States, with complications such as post-cardiotomy circulatory collapse occurring in 2-3% of cases. Extracorporeal Membrane Oxygenation (ECMO) is a critical salvage therapy for patients unable to wean from cardiopulmonary bypass (CPB). This study aims to review our institution's experience with ECMO in managing post-cardiotomy circulatory collapse and to analyze patient outcomes.

Methods: Following IRB approval, a retrospective descriptive study was conducted on patients aged 18–90 who underwent open-heart procedures requiring ECMO support from April 1, 2014, to December 31, 2022. Data were analyzed from electronic medical records for demographics, procedural details, ECMO therapy duration, and outcomes.

Results: Of 45 patients identified from 6,346 open-heart procedures during the study timeline, 33 were male, and 12 were female, with an average age of 59.9 years. The majority of patients were Caucasian (n=40). ECMO was initiated using venoarterial configurations in 42 of the patients. The average ECMO duration was 6.8 days. In-hospital mortality was 51.1% (n=23), while 48.9% (n=22) of patients survived to discharge. Survivors were discharged to rehabilitation facilities (n=12), home (n=7), long-term acute care hospitals (n=2), or detention centers (n=1).

Conclusions: ECMO remains a valuable rescue therapy for post-cardiotomy circulatory collapse, achieving a 48.9% survival rate at our institution. This study highlights the importance of timely intervention and underscores the need for future research into optimizing patient selection and perioperative management.

Supported by: The Professional Student Mentored Research Fellowship (PSMRF) Project is supported by the National Center for Advancing Translational Sciences through Grant UL1TR001998, UK HealthCare and the University of Kentucky College of Medicine.

Primary Presenter / email: **Conley, Keenan** / keenan.conley@uky.edu  
**Professional Student (MD, PharmD, Dentistry, PT)**  
**Clinical Research**  
**Cardiovascular**

Presentation **136**

Abstract Title: **Temporal Dynamics of Cardiovascular, and Thermoregulatory Homeostasis in Male and Female Mice**

Author(s): S. Naidu, Department of Physiology, U of Kentucky; T Seward, Department of Physiology, U of Kentucky; E. Rozmus, Department of Physiology, U of Kentucky; D. Burgess, Department of Physiology, U of Kentucky; A.N. Chacon, Department of Physiology, U of Kentucky; E. Schroder, Department of Physiology and Internal Medicine, U of Kentucky; A. Prabhat, Department of Physiology, U of Kentucky; B.P. Delisle, Department of Physiology, U of Kentucky

**Abstract:** Objective: The autonomic nervous system acts as a regulator to coordinate cardiovascular, thermoregulatory, and other homeostatic functions in our body.

Hypothesis: We hypothesize that dynamic changes in temperature adjustments are driven by rapid changes in cardiovascular parameters, with blood pressure and heart rate acting as early signals in the body's thermoregulation.

Methodology: Six adult wild-type male and female mice were surgically implanted with bipotential telemetry devices to continuously monitor mean arterial blood pressure (MAP), heart rate (HR) and core body temperature (Tb) under thermoneutral conditions. Mice were housed in 12h:12h light:dark cycle with ad libitum food, and data was collected for 10-second averages over 48 hours. Cross-correlation analysis was performed before and after removing the 24-hour rhythm component using LOESS regression.

Results: Cross-correlation analysis revealed strong coupling among all three physiological parameters, with MAP-HR showing the highest correlation, followed by MAP-Tb and HR-Tb. Detrended analysis showed moderately weaker correlation. Cross correlations between MAP and HR showed no lag and strong correlation in both signals, serving as positive control. With 24-hour rhythm, MAP led Tb by  $7.0 \pm 1.9$  minutes in males and  $8.6 \pm 1.8$  minutes in females, while HR preceded Tb by  $5.7 \pm 1.3$  and  $6.1 \pm 1.0$  minutes, respectively. These relationships persisted after detrending.

Conclusion: The maintained MAP-HR correlation after detrending and reduced temperature correlations, suggests that cardiovascular coupling operates independently of circadian rhythms, while temperature relationships maybe partially rhythm-dependent. This rapid lead-lag relationship between cardiovascular parameters, and Tb reveals novel temporal hierarchy in physiological regulation.

Supported by: This work is supported by the National Heart Lung and Blood Institute, R01HL172813, and R01HL153042 grant to Dr. Brian P. Delisle

Primary Presenter / email: **Naidu, Shrishti** / sln224@uky.edu  
**Graduate Student**  
**Basic Research**  
**Cardiovascular**

**Presentation 137**

**Abstract Title: Thrombotic Mechanisms in People Living with HIV at Initial Diagnosis**

**Author(s):** R. Robbe, U of Kentucky College of Medicine; D.F.D Mahmood, Saha Cardiovascular Research Center, U of Kentucky; H.R. Alfar, E.R. Driehaus, and C. Peng, Department of Molecular and Cellular Biochemistry, U of Kentucky; T. Myint, Division of Infectious Diseases, U of Kentucky; and J.P. Wood, Saha Cardiovascular Research Center, Department of Molecular and Cellular Biochemistry, Gill Heart and Vascular Institute, U of Kentucky

**Abstract:** Background: A leading cause of death in people living with human immunodeficiency virus (PLWH) is thrombotic events. Their thrombotic risk factors include decreased Protein S (PS) and elevated von Willebrand factor (VWF). VWF binds and inhibits PS when unfolded. PS is a cofactor for anticoagulant activated Protein C (APC). We hypothesize VWF-mediated PS inhibition contributes to thrombotic risk in PLWH. Methods: Plasma was collected from PLWH at initial diagnosis (n=5) and controls (n=8). Thrombin generation, PS activity, and microclots were measured.

Results: We optimized an assay to measure plasma PS activity. Tissue factor (TF)-initiated thrombin generation was measured with and without APC, as APC activity depends on PS concentration. APC, TF, and phospholipid (PL) concentrations were tested. APC was preincubated in plasma or added with a PL-TF mixture. 30 mM PL, 6.8 pM TF, and 5 nM APC were ideal, and APC had more effect with the mixture. The assay compared presence and absence of APC and vortexing, which unfolds VWF. Without APC, control plasma had elevated thrombin generation, seen as significantly increased endogenous thrombin potential (ETP); trends toward elevated peak thrombin and maximal velocity were also seen. With APC, these differences vanished and PLWH had prolonged lag time. These results indicate that reduced PS activity in PLWH promotes increased thrombin generation. The ratio comparing the effect of vortexing showed significantly increased ETP, peak thrombin, and maximal velocity without APC. These differences vanished with APC. Similar microclots between groups suggests an intact fibrinolytic system.

Conclusions: The data support the hypothesis that reduced PS activity contributes to thrombotic risk in PLWH. Future directions include measuring D-dimer and comparing parameters pre- and post- antiretroviral therapy. The data suggests monitoring and correcting VWF and PS levels in PLWH in clinical settings may decrease thrombotic risk.

**Supported by:** National Center for Advancing Translational Science grant UL1TR001998, NIH CCTS Award, NHLBI grant R35HL 150818

**Primary Presenter / email:** **Robbe, Rachel** / rco272@uky.edu  
**Professional Student (MD, PharmD, Dentistry, PT)**  
**Basic Research**  
**Cardiovascular**

**Presentation 138**

Abstract Title: **Computerized Decision Support for Stroke Prevention in High-Risk Atrial Fibrillation Patients in a Community Setting**

Author(s): B. E. Peterson, MD, MPH, St. Elizabeth Health., U of Kentucky Col. of Med; B. Bikdeli MD, MS, Thrombosis Research Group, Cardiovascular Medicine Division, Harvard Med School, YNHH/Yale Center for Outcomes Research and Evaluation; S. Rashedi, MD, MPH, Thromb. Res. Group; D. Krishnathasan, MS, Thromb. Res. Group; R. Solis, U of Kentucky College of Med; S. Z. Goldhaber, MD, Thromb. Res. Group, Cardio Med Division, Harvard Med School; G. Piazza, MD, MS, Thromb. Res. Group, Cardio Med Division, HMS.

**Abstract:** Atrial fibrillation (Afib) is the most common type of treated heart arrhythmia, where the heart beats too fast, slow, or irregularly (CDC). In 2021, Afib was attributed to over 230,000 deaths in the United States (CDC). Anticoagulation for Afib remains under-prescribed despite the various tools to assess the risk for stroke in these patients. Our study aims to determine if implementation of an alert-based computerized decision support (CDS) in a community setting would improve anticoagulation prescription. The study would include 2,400 patients in eight outpatient community settings (St. Elizabeth Healthcare and Mass General Brigham systems) who score 2 or higher for men and 3 or higher for women on the CHA2DS2-VASc score. The cluster allocation ratio would be 1:1 randomly for CDS versus no notification by study site and similarity regarding population density, socioeconomic, and ethnic-racial diversity. The primary efficacy outcome would be the frequency of oral anticoagulation prescription at 90 days in patients studied who have not been prescribed anticoagulation for stroke prevention. The secondary efficacy outcome would be the number of times anticoagulants were not prescribed in these patients in the CDS group. The tertiary efficacy outcome would be the frequency of adverse cardiac events at six months. Follow-up would be an Electronic Health Record review at six months after enrollment. A study focusing on CDS for high-stroke risk patients who have Afib is imperative to improve anticoagulation prescription and health outcomes. These results can potentially be applied to other community settings across the United States.

Supported by: The study has been supported by a research grant from Janssen Pharmaceuticals.

Primary Presenter / email: **Solis, Ricky** / rds0222@uky.edu  
**Professional Student (MD, PharmD, Dentistry, PT)**  
**Clinical Research**  
**Cardiovascular**

**Presentation 139**

Abstract Title: **Calcium Channel Blockers Versus Adenosine for Treatment of SVT in an Emergency Setting**

Author(s): A. Sturgill, College of Medicine, U of Kentucky; L. Ebbitt, UK HealthCare; R. Baum, Department of Emergency Medicine, U of Kentucky; E. Innes, UK HealthCare; J. Osmani, Department of Emergency of Medicine, U of Kentucky; M. Blackburn, Department of Emergency Medicine, U of Kentucky; T. Trott, Department of Emergency of Medicine, U of Kentucky; L. Alshawa, Department of Emergency Medicine, U of Kentucky

**Abstract:** Adenosine is the first-line agent for the treatment of stable supraventricular tachycardia (SVT). Recent evidence suggests that non-dihydropyridine calcium channel blockers (CCB) may be reasonable alternatives. This study sought to compare efficacy, adverse events and healthcare burden associated with the use of adenosine versus CCB for stable SVT in an emergency setting.

A retrospective chart review was performed of patients of any age who presented to an emergency department with SVT.

101 encounters were identified across 89 unique patients (64% female, 75.3% white) with a mean age of 44.9 +/-22.3 years and mean BMI of 27.4+/-8.4 kg/m<sup>2</sup>. SVT was treated with adenosine in 69 encounters (68.3%), CCB in 21 (20.8%), and a combination of the two in 11 (10.9%). There were no statistically significant differences in adverse event rates, NSR conversion rates, median LOS, admission rates, or median post-dose heart rates between the adenosine and CCB groups. There were significant differences between the adenosine and combination groups, including median LOS (3.63 vs 10.85 hours, p=.017), rate of hospital admission (37.7% vs 81.8%, p=.024), and NSR conversion rate (92.8% vs 45.5%, p=.0016) as well as between the CCB and combination group in rate of hospital admission (28.6% vs 81.8%, p=.024).

We found no clinical difference in using CCB instead of adenosine in the treatment of SVT in an emergency setting. There were significantly lower NSR conversion rates, LOS, and admission rates in patients receiving both adenosine and CCB. Based on our results, CCB is a reasonable first-line agent for stable SVT.

Supported by:

Primary Presenter / email: **Sturgill, Aidan / ast328@uky.edu**  
**Professional Student (MD, PharmD, Dentistry, PT)**  
**Clinical Research**  
**Cardiovascular**

Presentation **140**

Abstract Title: **Improvement in Psoriasis after Discontinuation of Apremilast (Otezla)- Case Report**

Author(s): Sarah Draud, University of Kentucky College of Medicine (M2); Valeria Miranda, University of Kentucky College of Medicine (M2); Louis A Ryes, University of Kentucky College of Medicine (M3); Beatriz H. Porras (MD), Dermatology, Skin Diagnostics

**Abstract:** Case Presentation: A 24-year-old male presented to dermatology with a lifelong history of onycholysis affecting all digits. Examination revealed nail bed separation and thin scalp hair, but no significant skin findings. Family history was negative for dermatologic or autoimmune conditions. Suspecting psoriasis, the patient was started on Apremilast. After five months, he experienced notable nail adherence and hair thickening, but treatment was discontinued due to nausea, vomiting, weight loss, and depression. Remarkably, these improvements have persisted for over 400 days post-treatment.

Discussion: Psoriasis is an autoimmune condition characterized by epidermal hyperproliferation and immune dysregulation. Apremilast, a PDE4 inhibitor, modulates inflammation and is an effective systemic treatment for moderate to severe psoriasis. Clinical trials have shown sustained improvements in nail and scalp psoriasis with Apremilast, even after discontinuation. However, long-term outcomes remain poorly documented. Previous case reports describe nail improvement up to 12 months post-treatment, but relapse is typically observed within weeks. Our patient's continued remission for over 400 days presents a unique treatment course, suggesting potential long-term alterations in keratinocyte behavior.

Conclusion: The sustained response seen in this case highlights the need for further research into Apremilast's long-term effects on psoriasis. Understanding its role in cellular remodeling could optimize treatment strategies and improve patient outcomes.

Supported by:

Primary Presenter / email: **Draud, Sarah / sedr230@uky.edu**  
**Professional Student (MD, PharmD, Dentistry, PT)**  
**Case Report**  
**Dermatology**

Presentation **141**

Abstract Title: **Access to Dermatological Care in Kentucky**

Author(s): R. Desai, College of Medicine, U of Kentucky; A. Marcelletti, College of Medicine, U of Kentucky; P. Shamaei Zadeh, College of Medicine, U of Kentucky; S. Daniel, College of Medicine, U of Kentucky; W. Cranford, Department of Biostatistics, College of Public Health, U of Kentucky; E. Slade, Department of Biostatistics, College of Public Health, U of Kentucky; J. C. Talbert, Division of Biomedical Informatics, College of Medicine, U of Kentucky; C. L. Wilson, Elkhorn Dermatology LLC

**Abstract:** This study investigates geographic disparities in access to dermatologic care in Kentucky, a state characterized by significant rural geography and poor national health rankings. Using 2019 Medicare data, provider distribution and utilization rates for dermatologic services were analyzed across Kentucky's 120 counties, classified as urban or rural, and adjusted for the Medicare population size. Geographic mapping of fee-for-service (FFS) Medicare beneficiaries served by practitioners in that county showed vast deserts of counties without local access to dermatologic procedures in rural Kentucky. Among the 550,718 FFS Medicare beneficiaries, 50.4% resided in rural areas, yet only 13.6% of dermatology providers served these counties. Providers performing complex dermatologic procedures are located in 31.4% of urban counties compared to 4.7% of rural counties ( $p < 0.001$ ). Less complex procedures showed similar disparities, with 37.1% of urban counties having providers compared to 17.6% of rural counties ( $p = 0.040$ ). Overall, urban beneficiaries were 8.5 times more likely to access dermatologic services than their rural counterparts. These findings underscore critical inequities in dermatologic care access, particularly for complex procedures essential for managing advanced conditions like melanoma, which has a higher incidence and mortality in rural Kentucky. Targeted interventions are necessary to address these disparities and improve dermatologic outcomes for rural populations.

Supported by:

Primary Presenter / email: **Desai, Roma** / rkde224@uky.edu  
**Professional Student (MD, PharmD, Dentistry, PT)**  
**Health Equity Research**  
**Dermatology**



**Presentation 142**

Abstract Title: **Bibliometric Analysis of Human Leukocyte Antigen Associations with Dermatologic Conditions**

Author(s): R. Lawless, University of Kentucky College of Medicine; T. Martin, East Tennessee State University College of Medicine; A. Marceletti, University of Kentucky College of Medicine; C. Geiger, East Tennessee State University College of Medicine; G. Rueff, East Tennessee State University College of Medicine; M. Theilmann, University of Kentucky College of Medicine; O. Lawrence, University of Kentucky College of Medicine; E. Mukherjee, Department of Dermatology, Vanderbilt University

**Abstract:** Background: Human leukocyte antigen (HLA) associations play a crucial role in autoimmune, autoinflammatory, and drug-induced dermatologic conditions. However, a comprehensive, objective aggregation of current knowledge is lacking. This review and bibliometric analysis address this gap by compiling HLA associations across various dermatologic diseases, including causative, protective, and prognostic biomarkers. Methods: A systematic PubMed search identified articles on autoimmune and autoinflammatory dermatologic conditions with known HLA associations. Eligible publications included original research, reviews, case reports, and meta-analyses in English and full-text format. Additional manual searches ensured comprehensive coverage. Articles were screened for relevance using Rayyan, and data extraction was structured in an Excel database aligned with predefined REDCap fields. Extracted data included disease name, HLA alleles (causative, protective, prognostic, and predictive of treatment response), ancestral haplotypes, demographics, genotyping platform, study type, and relevant statistical information. Results: The analysis included 1,666 publications (1976–2024) covering 131 dermatologic conditions. Autoimmune diseases (66.4%) were the most studied, followed by drug-induced reactions (13.4%) and inflammatory conditions (5.6%). Systemic lupus erythematosus, psoriasis, and pemphigus vulgaris were most frequently examined. The U.S. (15.4%), multi-country collaborations (11.5%), and Japan (7.4%) contributed the most studies. Drug-induced reactions linked to carbamazepine (25.4%), allopurinol (18.3%), and phenytoin (4.5%) were notable. Conclusion: This study compiles an updated database of HLA associations in dermatologic conditions, highlighting research trends and aiding in the identification of clinically relevant patterns for future studies and treatment strategies.

Supported by:

Primary Presenter / email: **Lawless, Rob / rrla227@uky.edu**  
**Professional Student (MD, PharmD, Dentistry, PT)**  
**Translational Research/Science**  
**Dermatology**

Presentation **143**

Abstract Title: **Community-Based Sunscreen Dispensers at Chandler Hospital: Findings and Review**

Author(s): Authors: P. ShamaeiZadeh, University of Kentucky College of Medicine; N. Ali, University of Kentucky College of Medicine; S. Ferrin, University of Kentucky Center for Interprofessional Health and Communications

**Abstract:** Background: This innovative community-driven project, unique in its approach, aims to raise awareness about sun safety and improve access to sunscreen at the University of Kentucky medical campus. By installing free sunscreen dispensers across Chandler Hospital, the initiative seeks to promote sun protection as a daily habit and reduce long-term health risks associated with ultraviolet (UV) exposure, particularly in the face of rising skin cancer rates in Kentucky.

Methods: Strategically placing dispensers in high-traffic areas such as outdoor study spaces and entrances to campus buildings, particularly for students who may not otherwise have them readily available. The project's comprehensive approach includes an educational flyer approved by the AAD (American Academy of Dermatology) highlighting the importance of regular sun protection. A QR code was provided to obtain feedback from the campus community on the importance of sunscreen use and data on public perception of sun safety practices and understanding.

Results: The survey collected a total of 34 responses. Significant results revealed that 35% of respondents reported not using sunscreen ever, 30% reported wearing sunscreen some days of the week, and 35% reported wearing sunscreen more than half the days of the week. The most common forms of sunscreen included lotions (82%) and sprays (36%), and the least common forms included gels (5%) and other topical products such as makeup (5%). 83% responded that the dispenser and its educational component helped remind people to wear sunscreen.

Conclusion: The results indicate that many students still neglect sunscreen use regularly, highlighting the need for continued efforts to integrate sun safety into daily routines. However, the potential impact of this project is inspiring. Future initiatives could include more targeted outreach, ongoing education, and broader participation to increase sun protection habits across populations further.

Supported by: Funded by University of Kentucky Student Government Association

Primary Presenter / email: **Shamaei Zadeh, Parisa** / pash226@uky.edu  
**Professional Student (MD, PharmD, Dentistry, PT)**  
**Community Research**  
**Dermatology**

Presentation **144**

Abstract Title: **Passive amylin immunotherapy improves brain function and reduces brain  $\beta$ -amyloid pathology in APP/PS1 mice**

Author(s): Deepak Kotiya, PhD, Department of Pharmacology and Nutritional Sciences, University of Kentucky, Lexington, KY, USA; Florin Despa, PhD, Department of Pharmacology and Nutritional Sciences, University of Kentucky, Lexington, KY, USA

**Abstract:** Background: Amylin, a hormone co-secreted with insulin by pancreatic  $\beta$ -cells, co-aggregates with  $\beta$ -amyloid in Alzheimer's disease (AD). This study assessed the safety and side effects of passive amylin immunotherapy in APP/PS1 and APP/PS1 mice in which human amylin replaced the mouse amylin gene (HuAmy-APP/PS1).

Method: A polyclonal anti-amylin antibody (P2) was generated in rabbits using the N-terminal amylin peptide. Five-month-old APP/PS1 males (n=4/group) received P2 (10 mg/kg of body weight) or vehicle-control thrice weekly for six weeks. Mice were monitored for side effects and immunocomplex-related symptoms. After treatment, brain function (novel object recognition test), body weight, and blood glucose (BG) levels were assessed. P2-antibody level was measured in plasma, brain, and kidney tissues. A $\beta$  levels in hippocampal tissues were analyzed using MSD-ELISA. Histological evaluations of brain and pancreas (by H&E and Prussian blue staining) assessed vascular integrity and microhemorrhages. The study is expanding to HuAmy-APP/PS1 mice (n=10/group).

Results: P2-injected APP/PS1 mice had significantly higher plasma P2-amylin antibody levels (p<0.001), with no detection in brain or kidney tissues. Histological analyses showed normal meninges and blood vessels in brain, and healthy pancreatic islets in P2-injected mice. Prussian blue staining showed no increase of microhemorrhage than controls. P2-injected mice showed a trend of enhanced recognition memory (p=0.1121) and lower BG (p=0.2602). HuAmy-APP/PS1 mice showed a similar trend (memory: p=0.1876, BG: p=0.8027). A $\beta$ -levels showed no significant differences due to the small sample size.

Conclusion: Passive amylin immunotherapy is well-tolerated in APP/PS1 mice without inducing adverse effects, supporting further investigation in HuAmy-APP/PS1 mice.

Supported by: AARF 2024 Effect of Passive Amylin Immunotherapy on Amylin and A $\beta$  Plaque Burden in AD (24AARF-1244535).  
NIH: Programming amylin secretion to slow brain aging - an animal model (5R01AG057290-03)

Primary Presenter / email: **Kotiya, Deepak** / kotiya.deepak@uky.edu  
**Staff**  
**Translational Research/Science**  
**Drug Development**

Presentation 145

Abstract Title: **STEAM Outreach through Data Sonification**

Author(s): K. Horne, College of Medicine, U of Kentucky; E. Guerrero, Department of Neuroscience, U of Kentucky; L. Rice, Department of Neuroscience, U of Kentucky; A. Hernandez, Department of Neuroscience, U of Kentucky; L. Mensah, Department of Neuroscience, U of Kentucky; J. Covington, Department of Neuroscience, U of Kentucky; A. Smith, Department of Neuroscience, U of Kentucky; T. Moyers, School of Music, U of Kentucky; M. Baker, School of Music, U of Kentucky; L. Bradley, Department of Neuroscience, U of Kentucky

**Abstract:** In the wake of continuously evolving technology, demand for individuals pursuing STEM careers continues to increase. Interest in STEM careers commonly develops in middle school and beyond. Further, it is vital that students be exposed to various resources and programs to foster their STEM-related interests. Fostering student interest requires students to have a basic understanding of scientific concepts. Given the increased complexity of these concepts, clearly communicating them to students is a challenge. To address this, we propose using data sonification, the method of converting information into sound, to provide an interactive modality of exploring the molecular basis of disease. Our collaborative project with the University of Kentucky School of Music involved engineering specialized software, the Data Sonification Synthesizer, as an interactive tool that illustrates important molecular concepts through sound. Designed for introductory middle school and high school students, each amino acid is converted to a musical note or tempo, based on its hydrophobicity, to identify changes and disruptions in protein sequence and its function in the context of a cell. Using data sonification to demonstrate the molecular basis of widely known diseases, such as osteogenesis imperfecta, epidermolysis bullosa simplex, Charcot-Marie-Tooth disease, sickle cell anemia, and more, our results show integrating the arts into STEM (forming STEAM) encourages students to continue pursuing STEM careers in higher education. Following additional development and analysis of our software, dissemination of this tool to the Commonwealth of Kentucky will enhance STEM interest across the state.

Supported by: This project was made possible by support from the University of Kentucky University of Kentucky College of Medicine Office of Community Advancement Stairway Funds and a Science Education Partnership Award (SEPA), Grant Number R25 GM132961, from the National Institute of General Medical Sciences (NIGMS) National Institutes of Health (NIH). Contents of this article are solely the responsibility of the authors and do not necessarily represent the official views of NIGMS or NIH.

Primary Presenter / email: **Horne, Kayla / kvho224@uky.edu**  
**Professional Student (MD, PharmD, Dentistry, PT)**  
**STEM Outreach**  
**Education**

Presentation 146

Abstract Title: **CMV Mononucleosis Complicated by Viremia and Colitis in an Immunocompetent Patient**

Author(s): C. Hartig, College of Medicine, U of Kentucky; M. Shakhashiro, Department of Internal Medicine, U of Kentucky; T. Myint, Department of Infectious Disease, U of Kentucky

**Abstract:** In immunocompetent persons, CMV infection is generally asymptomatic and rarely causes invasive disease. If symptomatic, CMV can cause a mononucleosis-like syndrome characterized by fever, generalized fatigue, and lymphadenopathy. Conversely, in immunocompromised patients CMV infection can cause hepatitis, retinitis, encephalitis, pneumonitis, peri- and myocarditis, and gastrointestinal manifestations such as colitis. We present a case of a 53-year-old immunocompetent female with a history of IBS-D with prior normal colonoscopy and psoriatic arthritis treated with NSAIDs who presented with fever, headache and a mononucleosis-like syndrome. She was found to have mild transaminitis. Tick borne workup was negative. Lumbar puncture was not significant. On day 3 of hospitalization, she began to experience severe watery diarrhea and was found to have a positive CMV IgM, CMV viremia with 97,146 IU/ml and underwent colonoscopy with tissue biopsy. Colonoscopy was notable for several colonic ulcerations. Tissue biopsy showed features of CMV viral cytopathic changes and positive CMV immunohistochemistry staining. She was subsequently diagnosed with CMV colitis and was initiated on IV ganciclovir followed by PO valganciclovir for a total of 21 days of treatment. Extensive workup for a possible source of immunodeficiency including HIV was negative. At 2 week follow up, quantitative serum CMV PCR was significantly decreased to 131 IU/ml and the patient endorsed baseline intermittent diarrhea consistent with her prior symptoms of IBS-D. Although atypical in immunocompetent patients, CMV colitis must remain in the differential diagnosis for acute diarrhea and fever in patients without immunocompromising conditions.

Supported by: None

Primary Presenter / email: **Hartig, Colton / cjha265@uky.edu**  
**Professional Student (MD, PharmD, Dentistry, PT)**  
**Case report**  
**GI**

Presentation **147**

Abstract Title: **Efficacy of Joint Fluid Cultures in BD Bactec® Bottles Compared to Routine Culture Media: A Quality Assurance Validation**

Author(s): T. Myint, Departments of Internal Medicine, Division of Infectious Diseases, U of Kentucky; J. A. Ribes, Department of Pathology and Laboratory Medicine, U of Kentucky

**Abstract:** Background: Some institutions utilize blood culture bottles (BCB) as part of their culture for sterile fluids. This practice may increase the rate of culture positivity. When performed as designed, these fluids should be supplemented with sterile blood or nutrients. UK has not validated the use of these bottles for non-blood samples. None the less, physicians often submit joint samples in BCB, so archival data are available for analysis for this sample source to determine the overall efficacy of culture using BCB compared to standard culture techniques.

Method: Electronical medical record searches were performed for the year 2020 (SUNQUEST) and June 2021-July 2022 (EPIC) to identify all positive cultures for joint fluids produced by BD Bactec® bottles associated with routine cultures for correlation.

Results: During the two-year period, there were 79 growth-positive joint BCB with routine culture results. Of these, 59 (74.7%) demonstrated 100% concordance by both culture methods and 20 (25.3%) produced discrepant results. Three of these discrepant results represented growth of fewer organisms on solid media compared to the bottles and the remaining 17 demonstrated growth only in the BCB. These discrepant cultures represented 6 *Staphylococcus aureus* (2 MRSA), 6 coagulase negative staphylococci, 4 streptococcal species, 1 Gram positive rod, and 3 Gram negative rods. Growth in 7/20 (35%) would have been classified as probable contaminants by blood cultured standards. The remaining 65% were likely significant. This shows that, even without the addition of the recommended supplements, BCB are able to support bacterial growth from many of these samples.

Supported by: None

Primary Presenter / email: **Myint, Thein** / [thein.myint3@uky.edu](mailto:thein.myint3@uky.edu)  
**Faculty**  
**Clinical Research**  
**Infectious Disease**

Presentation **148**

Abstract Title: **Exploring the Effects of pH on Antimicrobial Susceptibility to Treat Urinary Tract Infections**

Author(s): J. Ramirez, Departments of Microbiology & Immunology, U of Kentucky; J. Ramirez, Department of Biology, California Baptist University, Riverside, CA; A. Flores, Departments of Microbiology & Immunology, U of California, San Diego, CA

**Abstract:** The antibiotic industry faces ongoing challenges due to bacterial resistance, exacerbated by antibiotic overuse. The rapid mutation of bacteria outpaces the development of new antimicrobial drugs. One concerning strain is *Pseudomonas aeruginosa*, a gram-negative bacterium responsible for urinary tract infections (UTIs), which have a mortality rate of 67%. The urinary tract environment and the bacterium's physiology contribute to its resistance.

To combat this, researchers are exploring how altering environmental pH affects *P. aeruginosa*'s susceptibility to antibiotics, specifically Fosfomycin. By simply changing the environment to which bacteria thrive, such as pH, bacterial strains like *Pseudomonas aeruginosa* that cause urinary tract infections (UTIs) can become more susceptible to antibiotics. Minimum inhibitory concentration (MIC) techniques determine the lowest antibiotic concentration needed to suppress bacterial growth. In this study, 20 *P. aeruginosa* strains are tested at different pH levels. Resistance is defined as MIC values exceeding 8µg/mL. Preliminary findings indicate that acidic conditions (pH 6.0) increase susceptibility, whereas basic conditions (pH 8) enhance resistance in 35% of strains. Consistent MIC results confirming increased susceptibility under acidic conditions suggest that adjusting urinary pH could help combat *P. aeruginosa* infections. This could be achieved through oral medications or acidic liquids like cranberry juice. Findings from this study will contribute to broader research on *P. aeruginosa*, additional antibiotics, and other UTI-causing bacterial strains.

Supported by: California Baptist University Microgrant 2023

Primary Presenter / email: **Ramirez, Joshua** / Jcra242@uky.edu  
**Professional Student (MD, PharmD, Dentistry, PT)**  
**Translational Research/Science**  
**Infectious Disease**

Presentation **149**

Abstract Title: **Uncovering mRNA Modification-Dependent Dysregulation in Alzheimer's Disease: A Comparative Epitranscriptomic Analysis of Post-Mortem Human Brain Tissue**

Author(s): Grant A. Fox<sup>1,2</sup>, Bernardo A. Herberle<sup>1,2</sup>, J. Anthony Brandon<sup>1</sup>, Lacey A. Gordon<sup>1</sup>, Madeline L. Page<sup>1</sup>, Mark T. Ebbert<sup>1,2,3</sup>; <sup>1</sup>Department of Neuroscience, College of Medicine, University of Kentucky, Lexington, KY; <sup>2</sup>Sanders-Brown Center on Aging, University of Kentucky, Lexington, KY; <sup>3</sup>Department of Internal Medicine, College of Medicine, University of Kentucky, Lexington, KY

**Abstract:** Alzheimer's disease (AD) is the most prevalent neurodegenerative disorder in aging, affecting approximately 6.9 million Americans. Despite extensive research, understanding AD at the transcriptomic level remains limited. Notably, most loci associated with top AD risk genes lack known functional mutations, and these genes frequently produce multiple isoforms, potentially resulting in unique protein variants. To further our understanding of AD, this analysis focuses on the role of post-transcriptional RNA modifications like pseudouridine ( $\Psi$ ). Recent findings indicate lower N6-methyladenosine levels around amyloid plaques in 5xFAD mice, suggesting the involvement of RNA modifications in AD pathology.  $\Psi$ , the most abundant RNA modification in eukaryotic cells, is particularly enriched in brain tissue. Moreover, cell culture studies have demonstrated that  $\Psi$  can be dynamically regulated in response to cellular stress.  $\Psi$  writer enzymes show moderate gene expression in cortical brain regions. These changes in  $\Psi$  levels and its presence in genes linked to brain diseases, including AD, underscore its potential significance. However, the identification of  $\Psi$  sites is hindered by the limitations of standard RNA sequencing technologies. This analysis utilizes long-read direct RNA sequencing to overcome these limitations, allowing for the direct measurement of RNA modifications. Preliminary analysis from the dorsolateral prefrontal cortex identified several genes related to brain diseases that contain unique  $\Psi$  sites at protein-coding genomic loci, indicating a possible role for  $\Psi$  in AD pathology. This research aims to pioneer the study of  $\Psi$  in AD, potentially opening new avenues for therapeutic strategies targeting  $\Psi$  mRNA modifications in AD.

Supported by: This work was supported by the National Institute of Health [R35GM138636, R01AG068331 to M.E., and the BrightFocus Foundation [A2020161S to M.E.], Alzheimer's Association [2019-AARG-644082 to M.E.], PhRMA Foundation [RSGTMT17 to M.E.], Ed and Ethel Moore Alzheimer's Disease Research Program of Florida Department of Health [8AZ10 and 9AZ08 to M.E.], and the Muscular Dystrophy Association.

Primary Presenter / email: **Fox, Grant** / gafo223@uky.edu  
**Graduate Student**  
**Basic Research**  
**Informatics**



Presentation **150**

Abstract Title: **Clinical and Radiological Differences in Diagnosing CLIPPERS Among Other Autoimmune Neurologic Disorders**

Author(s): M.N. Baker, Department of Neurology, U of Kentucky; J. Youssefi, Department of Neurology, U of Kentucky; J. Avasarala, Department of Neurology, U of Kentucky

**Abstract:** Chronic Lymphocytic Inflammation with Pontine Perivascular Enhancement Responsive to Steroids (CLIPPERS) is a rare inflammatory central nervous system syndrome with characteristic clinical, radiological, and pathological findings. Symptoms can include sensory and motor facial deficits, diplopia, vertigo, nystagmus, and ataxia. MRI is notable for "salt and pepper"-like punctate and curvilinear enhancing lesions in the pons and surrounding structures. Histology after brain biopsy can reveal perivascular T-cell-predominant inflammatory infiltration. The hallmark of this syndrome is marked improvement in clinical symptoms and imaging following treatment with steroids. Here, we describe a 49-year-old female who initially presented with vision loss in the right eye and facial numbness. Similarly to the few cases of CLIPPERS described in literature, the suspicion for CLIPPERS arose in the following months after worsening of symptoms and negative workup for CLIPPERS-mimics. Our patient's symptoms extended to tingling of the right scalp, dysarthria, and left-sided extremity spasms. This led to an early concern for autoimmune processes such as Multiple Sclerosis (MS) and Seronegative Neuromyelitis Optica (NMO); however, these conditions were later ruled out. The diagnosis of CLIPPERS was given after clinical and imaging findings improved following administration of IV methylprednisolone. This diagnosis was further supported with how our patient relapsed after steroids were discontinued. Our case contributes to the existing literature by highlighting the need for a having broad differential diagnosis and a high index of suspicion for rare disorders when patients present with indistinct neurologic symptoms, as this syndrome drastically differs clinically and radiologically during periods of flares and remission.

Supported by:

Primary Presenter / email: **Baker, Mindy** / mng227@uky.edu  
**Medical Resident/Fellow**  
**Case Report**  
**Neurology**

**Presentation 151**

Abstract Title: **White Matter in Flux: Investigating Structural Changes in WMH Growth and Regression: MRI study**

Author(s): Ahmed Bahrani, Department of Neurology, U of Kentucky, KY; Michael Maisel, Department of Neuroscience, U of Kentucky, KY; Moaz Ibrahim, Sanders-Brown Center on Aging, U of Kentucky, KY; Mohib Haider, Department of Neuroscience, U of Kentucky, KY; David Power, Department of Neuroscience, U of Kentucky, KY; Linda Van Eldik, Sanders-Brown Center on Aging, U of Kentucky, KY; Larry Goldstein, Department of Neurology, U of Kentucky, KY; Gregory Jicha, Department of Neurology, U of Kentucky, KY;

**Abstract:** Background: White matter hyperintensities (WMH) are linked to cerebrovascular disease (CVD) and cognitive decline, yet their microstructural integrity remains unclear. WMH exhibits dynamic behavior, where regions grow, remain stable, or regress over time. Traditional volumetric approaches fail to capture these changes. Also, there is a lack of systematic techniques to track these longitudinal changes at the microstructural level. This study utilizes diffusion tensor imaging (DTI)-based fractional anisotropy (FA) to assess white matter (WM) integrity across WMH growth, regression, and normal-appearing WM (NAWM) using a novel longitudinal WMH growth/regression (WMHGR) pipeline, validated within the MarkVCID consortium.

Methods: Seventy-six longitudinal 3D FLAIR and T1-weighted MRI scans from the University of Kentucky were analyzed using the WMHGR pipeline to track WMH dynamics. FA masks from DTI sequences were registered to FLAIR images to extract FA values from four regions: (1) WMH growth, (2) WMH regression, (3) NAWM, and (4) total WMH. Statistical analyses assessed FA differences.

Results: Significant FA differences were observed across regions ( $p < 0.001$ ), except between WMH growth and regression. Total WMH exhibited the lowest FA, reflecting severe microstructural disruption. WMH growth and regression regions showed intermediate FA values, suggesting partial recovery in regressing WMH and progressive damage in growing WMH. NAWM had the highest FA, reinforcing widespread white matter compromise.

Conclusions: These findings highlight heterogeneous WMH microstructural alterations. Our validated longitudinal pipeline provides a sensitive neuroimaging biomarker for CVD and Alzheimer's disease, enabling better tracking of disease progression and potential therapeutic effects.

Supported by: 4UF1NS125488-02; University of Kentucky ADRC (REC scholar)

Primary Presenter / email: **Bahrani, Ahmed** / ahmed.bahrani@uky.edu  
**Faculty**  
**Translational Research/Science**  
**Neurology**

Presentation **152**

Abstract Title: **Liquid Embolic MMA Embolization Leads to Earlier Symptom Resolution in cSDH Compared to PVA Particles**

Author(s): S. Brandenburg, College of Medicine, U of Kentucky; F. Horne, College of Medicine, U of Kentucky; K. Boulnemour, Dpt of Neurosurgery, U of Kentucky; J. Frank, Dpt of Neurosurgery and Center for Advanced Translational Stroke Science, U of Kentucky; S. Pahwa, Dpt of Radiology, U of Kentucky; M. Al-Kawaz, Dpt of Radiology, Neurology, and Neurosurgery, U of Kentucky; J. Fraser, Dpt of Neurosurgery, Neurology, Radiology, and Otolaryngology, U of Kentucky; D. Dornbos III, Dpt of Neurosurgery, U of Kentucky

**Abstract:** Introduction: Middle meningeal artery (MMA) embolization has been shown to be beneficial for resolution of chronic subdural hematomas (cSDH). This study sought to evaluate patient outcomes following MMA Embolization using liquid embolic agents (Onyx) and polyvinyl alcohol (PVA) particle embolic agents for treating cSDH.

Methods: A retrospective analysis was conducted using a prospectively maintained database including all MMA embolizations performed for cSDH between 2019 and 2024 at a single institution. 78 patients treated with Onyx embolization were compared to 33 patients treated with PVA. Data on baseline demographics and radiographic metrics were collected on admission. Additional variables included procedural and post-procedural metrics, length of stay, prior treatment, and patient outcomes. Continuous and categorical variables were compared using unpaired t-tests and Fisher's exact tests, respectively.

Results: Patients treated with Onyx embolization demonstrated earlier symptom resolution (Figure 1) compared to PVA patients ( $49 \pm 7$  v  $103 \pm 19$  days,  $p=0.0024$ ). There was no significant difference in days to subdural hematoma resolution between groups ( $157 \pm 21$  v  $120 \pm 21$  days  $p=0.4439$ ), but Onyx embolization was associated with a trend toward higher likelihood of complete SDH resolution (30% vs. 15%,  $p=0.1005$ ). Onyx embolization was more frequently preceded by a two-burr hole washout or craniotomy (55% vs. 33%  $p=0.0402$ ), though prior treatment did not affect symptom resolution rates within the cohort. No other significant differences were found between the groups.

Conclusions: Onyx embolization for cSDH is associated with earlier symptom resolution compared to PVA particles. This difference may be attributable to Onyx having a more durable embolization and decreased secondary inflammatory response. PVA embolization relies on chronic inflammation and vessel fibrosis for embolization, which may explain the increased time to symptom resolution in this cohort.

Supported by:

Primary Presenter / email: **Brandenburg, Spencer** / sebr255@uky.edu  
**Professional Student (MD, PharmD, Dentistry, PT)**  
**Clinical Research**  
**Neurology**

Presentation **153**

Abstract Title: **Extracting HMW DNA for optical genome mapping with Bionano Saphyr reveals structural variants of disease related genes**

Author(s): L. A. Gordon, Sanders Brown Center on Aging, U of Kentucky; J. A. Brandon, Sanders Brown Center on Aging, U of Kentucky; M. E. Wadsworth, Sanders Brown Center on Aging, U of Kentucky; M. T. Ebbert, Sanders Brown Center on Aging, U of Kentucky, Lexington, KY

**Abstract:** The sequencing of DNA through short-read technologies opened the door for long molecule technologies that allow for the sequencing and/or visualization of complex genomic regions, structural variants, and proper genomic assembly that short-read technologies had failed to provide. Optical genome mapping technologies, like the Bionano Saphyr, allows for cytogenic analysis at a more detailed level than older techniques. Bionano Saphyr can identify copy number and structural variants in the same test attributable to the incorporation of high-resolution microscopy and microfluidics.

The Saphyr requires high molecular weight DNA, typically defined as  $\geq 50$  kbp, which is extremely difficult to extract from aged human prefrontal brain tissue due to high levels of ferritin, myelin, and other cellular debris that must be removed from the sample for proper staining and labeling in the Saphyr. We developed a method to mitigate and remove the effects of these debris and contaminants through the development of precise cellular and nuclear lysis buffers for DNA extraction.

Our DNA extraction protocol produces clean, homogenized gDNA of  $\geq 150$  kbp and an average concentration of 100 ng/ $\mu$ l from approximately 60 mg of post-mortem aged human prefrontal cortex tissue.

The production and proper labeling of gDNA allowed for visualization of structural variants and copy number variants in disease-related genes including MAPT, CR1, and C9orf72. C9orf72 mosaicism can be visualized by the individually labeled DNA molecules that show the vast difference between the number of repeat expansions between molecules, with high levels of repeat expansions being indicative of amyotrophic lateral sclerosis.

Supported by: National Institutes of Health (R35GM138636, R01AG068331), the BrightFocus Foundation (A2020161S), Alzheimer's Association (2019-AARG-644082), PhRMA Foundation (RSGTMT17)

Primary Presenter / email: **Gordon, Lacey** / lago233@uky.edu  
**Staff**  
**Basic Research**  
**Neurology**

**Presentation 154**

Abstract Title: **Exploring the Effects of Mixed Reality as a Cognitive Rehabilitation Aid in Stroke**

Author(s): E. E. Medina, College of Medicine, U of Kentucky; A. C. Glueck, Department of Neurology, U of Kentucky

**Abstract:** The chronic manifestations of stroke are commonly multisystemic, affecting motor function, sensation, proprioception, cognition, and more. Naturally, these long-lasting effects lead to significant lifestyle modifications and necessitate rigorous and extensive rehabilitative efforts. Conventional interventions have limitations when it comes to their cost and mundane nature, often being perceived as boring. In Kentucky, a high prevalence of risk factors has resulted in a reported 4.9% of the adult population experiencing a stroke, many of whom require medical intervention whose limitations strain both the patient and the healthcare system. Recently, extended reality (XR) has demonstrated promise as a rehabilitative aid for cognition, proprioception, and motor function following stroke without conventional therapy constraints. This case series explores the relationship between mixed reality (MR; one modality of XR) and cognitive performance in three post-stroke patients. Two females and one male, aged between 30-60 years, with mild cognitive impairment and a stroke history no earlier than four months before testing, were recruited for participation. Participants engaged in 12, one-hour MR training sessions over 4 weeks. Cognitive performance was assessed, and changes were compared across three timepoints: baseline, immediately following the intervention, and following a 90-day washout period. Participants demonstrated improvement in memory, executive function, and processing speed. Additionally, two out of the three participants demonstrated trends for improvement in attention and working memory. While these promising results tentatively suggest that 12 hours of mixed reality training may yield cognitive improvement in post-stroke patients, a larger sample size is needed before drawing definitive conclusions.

Supported by: NRPA Pilot Award

Primary Presenter / email: **Medina, Elbuth / eeme234@uky.edu**  
**Professional Student (MD, PharmD, Dentistry, PT)**  
**Clinical Trial**  
**Neurology**

Presentation **155**

Abstract Title: **Analyzing Stress Reactions in Community-Dwelling Individuals with Alzheimer's Disease and Associated Behavioral Symptoms**

Author(s): B. Carter, College of Medicine, U of Kentucky; M.S.H. Onim, Tickle College of Engineering, U of Tennessee, Knoxville, TN; N. Wolff, College of Medicine, U of Kentucky; H. Thapliyal, Tickle College of Engineering, U of Tennessee, Knoxville, TN; E. Rhodus, College of Medicine, U of Kentucky

**Abstract:** Background: Alzheimer's disease and related dementias (ADRD) gradually reduce an individual's ability to complete daily activities. This reduction is often accompanied with stress responses and onset of behavioral and/or psychiatric symptoms (BPSD). Increased innovation of biometric tracking mechanisms presents the opportunity to monitor and predict BPSD during functional activities in community residing individuals with ADRD.

Methods: Secondary data analysis was conducted from a non-pharmacological randomized controlled clinical trial for persons with ADRD. Caregiver-reported activity tracking and biometric data were analyzed. Data collection included one week of caregiver-reported activity tracking with rating of "stressed" or "not stressed" states during activities. Simultaneously, participants with ADRD wore a wrist device that continuously collected biometric data: electrodermal activity, blood pressure volume, heart rate variability, and skin temperature. Analyses included categorical quantification of activities reported and correlational assessment of caregiver-reported stress to biometric markers of stress.

Results: Preliminary analyses included 16 persons with AD age  $x=80\pm9.9$  years; 9 female, 7 male. Stressed states were most frequent during bathing/grooming (reported 85% of the time), socialization (reported 85% of the time), and community mobility (out of the home; 62% of the time). Clusters of stress were also observed in the early morning and evening hours. Further, unsupervised machine learning models were able to create digital biometrics that mirrored caregiver-reported periods of stress with improved accuracy.

Conclusion: Use of wearable biometric monitoring in conjunction with caregiver reporting was feasible and mirrored identification of stressed states. Additional research is needed to expand machine learning algorithms with predictive capability.

Supported by: Funding via NIH/NIA K23-AG075262.

Primary Presenter / email: **Carter, Brian / bgca227@uky.edu**  
**Professional Student (MD, PharmD, Dentistry, PT)**  
**Clinical Trial**  
**Neuroscience**

Presentation **156**

Abstract Title: **Energy Homeostasis within the Brain is Negatively Affected by Diabetes-related Amylin Loss-of-Function**

Author(s): R. S. Davargaon, Department of Pharmacology and Nutritional Sciences, U of Kentucky; N. Verma, Department of Pharmacology and Nutritional Sciences, U of Kentucky; J. Bain, Department of Medicine, U Duke, Durham, NC; F. Despa, Department of Pharmacology and Nutritional Sciences, U of Kentucky;

**Abstract:** Introduction: Amylin, a pancreatic hormone co-secreted with insulin, crosses the Blood-brain-barrier to regulate satiation. However, in type-2 diabetes, it forms amyloid in the pancreas and co-aggregates with  $\beta$ -amyloid in Alzheimer's brains. We hypothesize that amylin's loss-of-function due to amyloid formation and its toxic accumulation in the brain disrupt energy homeostasis.

Objectives: Compared metabolite fluxes within rat brain-tissue associated with genetic suppression of amylin (amylin loss-of-function) vs. brain amylin amyloid accumulation (amylin toxicity).

Methods: Non-targeted metabolomics analysis of cerebral cortex tissues from 16-month-old rats expressing human-amylin in the pancreatic  $\beta$ -cells (HIP rats) and age-matched rats with deleted amylin gene (AKO rats), we analyzed metabolites involved in glucose, amino acid and lipid metabolism pathways. Age-matched wild-type-rats expressing non-amyloidogenic rat amylin served as control-rats.

Results: In a comparative analysis of rat brains, dysregulated metabolites linked to glycolysis and citric acid cycles were detected in HIP-rats, contrasting with findings in AKO rats. Additionally, brain amylin accumulation in these rats corresponded with altered amino acid metabolites important for neuroprotection, neurotransmitter synthesis, and neurodevelopment. Furthermore, lipid metabolism pathways associated with neuroinflammation, immune response, brain function, cognition, anti-oxidation, and aging were also disrupted in HIP-rats. Conversely, genetic suppression of amylin in AKO-rats led to changes in phenylalanine levels and lipid metabolites critical for brain fueling and neuroprotection when compared to WT-rat brains.

Conclusion: Both brain amylin-amyloid accumulation (toxicity) and amylin loss-of-function affect energy metabolism within the central nervous system. Further validation is required to confirm the extent of amylin-related alteration of metabolite fluxes within the brain.

Supported by: NIH award: 5R01AG057290-03; NIH award: 5R01AG053999-03

Primary Presenter / email: **DAVARGAON, RAVICHANDRA / RDA278@UKY.EDU**  
**Postdoctoral Scholar/Fellow**  
**Basic Research**  
**Neuroscience**

Presentation **157**

Abstract Title: **Ictal SPECT vs. Postictal MRI for Seizure Onset Zone Localization**

Author(s): M. Kilgore, Z. Winder, MD, PhD, R. Cloyd, MD, PhD, V. Zachariou, PhD, J. Clay, MD, D. Powell, PhD, R. El Khouli, MD, PhD, F. Mirza, MD, R. Ward-Mitchell, RN, K. Hulou, MD, U. Khalid, MD, A. Barty, MD, F. Raslau, MD; Department of Radiology, University of Kentucky; Department of Neurology, University of Kentucky; Department of Neurosurgery, University of Kentucky

**Abstract:** Purpose: 35% of patients with epilepsy are refractory to anti-seizure medications and may benefit from surgical resection if the seizure onset zone (SOZ) is localized. Presurgical evaluation identifies candidates for invasive stereotactic EEG (SEEG) monitoring. In addition to semiology, ictal EEG, MRI, and PET, complex patients require further workup with ictal SPECT, which captures brain perfusion at the time of radiotracer injection. However, its reliance on rapid injection within seconds of seizure onset often leads to failed admissions. Postictal MRI using arterial spin labeling (ASL) offers an alternative by measuring perfusion changes minutes after seizures, potentially serving as a valuable SOZ biomarker. This study compares postictal ASL workflow versus established ictal SPECT to assess its clinical value.

Methods: Patients admitted for ictal SPECT were recruited. MR-conditional electrodes were placed, and standard protocol was followed for ictal SPECT. MRI occurred on admission day and 20-90 minutes postictally. ASL images were processed using AFNI and FSL to generate perfusion maps and thresholded at 1% hypoperfusion/hyperperfusion. SOZ was determined by expert consensus, prioritizing SEEG results when available.

Results: 15 patients were recruited, with 11 experiencing seizures (23 total seizures). Ictal SPECT was achieved in 8/23 (35%) seizures and postictal ASL in 10/23 (43%). SOZ concordance was 3/8 for ictal SPECT (38%) and 6/10 for postictal ASL (60%).

Conclusion: Postictal ASL captured more seizures and showed higher concordance than ictal SPECT, outperforming ictal SPECT in feasibility and accuracy for SOZ localization in refractory focal epilepsy. These findings support ASL integration into standard practice.

Supported by:

Primary Presenter / email: **Kilgore, Madison / mki313@uky.edu**  
**Professional Student (MD, PharmD, Dentistry, PT)**  
**Clinical Research**  
**Neuroscience**



Presentation **158**

Abstract Title: **Social Determinants of Whole-Food, Plant-Based Diet Adoption Among Individuals at Risk for Cardiovascular Disease**

Author(s): R.R.Andrews, Department of Pharmacology & Nutritional Sciences, U of Kentucky.

**Abstract:** Background: Clinical trials have demonstrated that adhering to a whole-food, plant-based (WFPB) diet effectively prevents and reverses cardiovascular disease. The majority of physicians are willing to recommend a WFPB diet, and the majority of patients are willing to try it. However, concerns exist over patient acceptability. Studies have identified common perceived determinants of WFPB adherence, but social and relationship-oriented factors remain underexplored. This study applies the biopsychosocial model to explore factors influencing WFPB diet adoption among Kentuckians at risk for cardiovascular disease.

Methods: This cross-sectional, mixed-methods study aims to recruit 50 participants from the University of Kentucky Family Medicine Clinic, Gill Heart Institute, flyers placed in the community, and through ResearchMatch. Eligibility will be confirmed via a screening survey. Participants will be briefly introduced to the evidence-based benefits of a WFPB diet in two short video news clips and then complete a survey assessing their willingness to try a WFPB diet for at least three weeks along with their perceived adherence barriers and enablers, followed by a qualitative interview to gain deeper insights into the adherence barriers and facilitators they anticipate. Interviews will be semi-structured, recorded, transcribed, and analyzed thematically.

Results: This study has been ongoing since July 2024. Results are expected by March 26th, 2025.

Conclusion: By integrating survey and qualitative data, this study will provide a nuanced understanding of the challenges and motivators for WFPB diet adherence. Findings will inform targeted interventions to enhance WFPB diet adoption and long-term adherence, ultimately improving health outcomes in this high-risk population.

Supported by: Department of Family & Community Medicine Fellowship, Dr. Brittany Smalls, faculty advisor

Primary Presenter / email: **Andrews, Reya** / Reya.Andrews@uky.edu  
**Graduate Student**  
**Community Research**  
**Nutrition**

Presentation **159**

Abstract Title: **Evaluating Early Intravenous Nutrition and Outcomes in Neonates Undergoing Therapeutic Hypothermia Protocol**

Author(s): K. Moorman, Department of Pediatrics- Neonatal and Perinatal Medicine, University of Kentucky;  
T. Sithisarn, Department of Pediatrics- Neonatal and Perinatal Medicine, University of Kentucky;  
H. Bada, Department of Pediatrics- Neonatal and Perinatal Medicine, University of Kentucky,  
Lexington, KY

**Abstract:** Background: Hypoxic ischemic encephalopathy (HIE) is a serious neurological condition in term infants and results in long-term developmental delays. There are no guidelines for the best nutritional support for these infant while undergoing therapeutic hypothermia (TH).

Objectives: We aimed to assess the correlations of current intravenous nutrition practices for HIE infants in our neonatal intensive care unit, by assess the short-term outcomes on days to full enteral feeds, electrolyte derangements, growth parameters and length of stay (LOS).

Study design: We conducted a retrospective chart review of infants ( $\geq 35$  weeks of gestation) with HIE undergoing TH from June 2021-June 2024. Infants were grouped based on source of intravenous nutritional support at 36 hours of life (Dextrose containing IV fluids (IVF) vs parenteral nutrition (PN)).

Results: A total of 102 infants were included (55 PN group and 47 IVF). Both groups had similar maternal and infant demographic characteristics, except for site of delivery which inborn was higher in the PN group. No differences in HIE severity classification were found between groups. LOS (PN (10.5) vs IVF (10.5)  $p=0.098$ ) and days to full enteral feeds (PN (6) vs IVF (7)  $p=0.056$ ) were not different between groups. For secondary outcomes, days with central lines, incidence of hypoglycemia and diagnoses of acute kidney injury were different, in favor of PN group. Both groups demonstrated similar growth parameters and no differences in blood stream infection rates between groups.

Conclusion: We found no correlations between PN and IVF for HIE infants undergoing TH and major short-term outcomes.

Supported by: None

Primary Presenter / email: **Moorman, Kelsey / kemo269@uky.edu**  
**Medical Resident/Fellow**  
**Clinical Research**  
**Nutrition**

Presentation **160**

Abstract Title: **Perimetry Results with VirtualField's Virtual Reality Program are Comparable to the HFA-III**

Author(s): M. E. Baxter, University of Kentucky College of Medicine; S. J. Hughes, Department of Ophthalmology, University of Kentucky; D. B. Moore, Department of Ophthalmology, University of Kentucky

**Abstract:** Perimetry measurements are routinely taken for glaucoma patients in ophthalmology clinics. The standard perimetry device is the Humphrey Field Analyzer (HFA) III. The HFA-III is bulky and can be expensive; testing can only be done in the clinic setting. Recently, virtual reality (VR) companies have designed programs to replace such machines as the HFA-III. The VR programs are intended to save space, time, and money. A study at the University of Iowa is comparing the "performance, accuracy, and patient comfort" of the SmartSystem VR program to the HFA-III. The study seeks to enroll 50 subjects between ages 18-100 and give them a 13-question survey to measure patient experience. VirtualField, similar to SmartSystem, has developed programs for ophthalmologic measurements including perimetry. In previous studies, VirtualField's VR perimetry program has fewer false positives, lower pattern deviation, and 2.4-minute lower test duration when compared to the standard HFA-III. We aimed to review both efficacy and comfort of VirtualField's VR headset and perimetry program, similar to the ongoing investigation comparing SmartSystem to HFA-III, including glaucoma patients at the University of Kentucky. We enrolled 15 glaucoma patients in the study. Patients took perimetry tests both on the HFA-III and on the VR set during the same clinic visit. They then answered a 7-question survey regarding the comfort of the setup and ease of use. Data gathered from the devices was compared. The results from the VR set were similar to those from the HFA-III. The comfort was slightly better with the VR set. These results suggest VirtualFields's VR program for perimetry is a viable alternative to the HFA-III in glaucoma clinics.

Supported by: VirtualField, National Center for Advanced Sciences through the NIH Grant: UL1TR001998, and the PSMRF program.

Primary Presenter / email: **Baxter, Mary** / meba300@uky.edu  
**Professional Student (MD, PharmD, Dentistry, PT)**  
**Clinical Research**  
**Ophthalmologic**

Presentation **161**

Abstract Title: **A Novel Technique for Glenoid Labrum Reconstruction: The GALIN Technique**

Author(s): L. Comas, J. Marsh, C. Muench, S. Kamineni, MD, Department of Orthopaedics, U of Kentucky

**Abstract:** Introduction: Glenohumeral joint instability following anterior shoulder dislocation remains a pervasive issue in Orthopedics. It is well documented in literature that even after surgical intervention many patients will experience subsequent subluxation/dislocation events. Many procedures such as Bankart repair, capsular plication and subscapular augmentation, among others, have been developed and are in current use to improve shoulder stability. While these arthroscopic procedures manage to improve stability compared to non-treated shoulders, they do not demonstrate the ability to reestablish/maintain the glenohumeral joint's original stability and range of motion for every patient. Titled Glenoid Augmentation using the Long head for shoulder INstability (GALIN), we will discuss a novel technique which utilizes the tendon of the long head of the biceps brachii (LHBT) as a locally sourced autograph. This technique may be most utilized as an alternative for Bankart repairs when the labrum cannot be reattached due to extensive damage or failed prior surgeries.

Surgical Technique/Methods: The procedure technique involves precise tenodesis of the proximal aspect of the LHBT between the LHBT and pectoralis major insertion point (exact location is patient dependent). It will then be transferred to the glenohumeral joint and appropriately buttoned, either as an enhancement or replacement of a deteriorating labrum. This procedure has been proven to enhance the glenoid labrum depth and increase glenohumeral stability.

Discussion: GALIN offers a promising alternative for patients who experience severe labrum loss or recurring shoulder dislocations even after current surgical procedures yield unacceptable results. It addresses the patient population who do not find appropriate symptom alleviation through current surgical methods.

Conclusion: GALIN provides robust reconstruction of the affected labrum, significantly advancing treatment in recurrent glenohumeral instability.

Supported by:

Primary Presenter / email: **Comas, Luis** / laco278@uky.edu  
**Professional Student (MD, PharmD, Dentistry, PT)**  
**Clinical Research**  
**Orthopedic**

**Presentation 162**

Abstract Title: **Materials in Shoulder Arthroplasty 1 - Historical Evolution**

Author(s): J. I. Bird, College of Medicine, U of Kentucky; S. Kamineni, Department of Orthopedic Surgery and Sports Medicine, U of Kentucky; C. W. Garrison, College of Medicine, U of Kentucky

**Abstract:** Introduction: The usage of different biomaterials in arthroplasty have evolved considerably since the end of the nineteenth century. The type of material used in a given prosthesis can have profound implications on the long term performance of that prosthesis. While there has been extensive research on hip and knee arthroplasty, there have been few studies focusing on the historical development of materials used in shoulders. Objective: This narrative review will summarize the historical advancement of biomaterials used in shoulder arthroplasty. It will highlight both failures and breakthroughs, as well as what materials are used in the modern day and what future research is focused on.

Methods: A literature search was conducted using both PubMed and Google Scholar, where articles pertaining to different material usage in shoulder arthroplasty from the 1890s to the modern day were identified.

Conclusion: The history of biomaterial usage in shoulder arthroplasty contains a broad spectrum of different materials used in different types of prostheses. Over time many advances in prosthesis performance have been made. However, issues still exist in terms of biocompatibility and wear resistance. Future research on new materials will need to focus on strength, biocompatibility, and surface properties in order to prevent complications.

Supported by:

Primary Presenter / email: **Bird, Joel / jibi223@uky.edu**  
**Professional Student (MD, PharmD, Dentistry, PT)**  
**Literature Review**  
**Orthopedic**

**Presentation 163**

Abstract Title: **From Likes to Rankings: How Social Media Can Predict Orthopaedic Surgery Residency Doximity Rank**

Author(s): E. H. Blank, College of Medicine, U of Kentucky; D. M. Howell, College of Medicine, U of Kentucky; W. G. S. Southall, College of Medicine, U of Kentucky; Y. Patel, College of Medicine, U of Kentucky; S. Slone, Dr. Bing Zhang Department of Statistics, U of Kentucky; R. D. Muchow, Department of Orthopaedic Surgery and Sports Medicine, U of Kentucky

**Abstract:** Introduction: Social media has become an increasingly valuable resource for prospective orthopaedic surgery residency applicants. This study hypothesized that higher-ranked programs on Doximity would have greater social media engagement.

Methods: Orthopaedic surgery residency programs were identified through the 2023-2024 Doximity Residency Navigator, along with respective reputation rank and program size. The number of followers, posts, and likes for each program's accounts (Instagram, X, and Facebook) throughout 2023 were collected. To assess which measures significantly correlated with rank, the feasible solutions algorithm (FSA) was implemented to find which variables maximized R-squared in models predicting a top 50 program. A logistic regression model was run using presence of accounts, program size, and total Instagram likes in 2023, the variables selected by the FSA.

Results: 205 orthopaedic surgery residency programs were ranked on Doximity. All top 50 programs had Instagram, 39 had X, and 21 had Facebook. Large (>30 residents) and medium (20-30 residents) programs represented 49 of the top 50 programs. The logistic regression model found program size and Instagram likes per post in 2023 to be significant predictors of higher reputation ranking. Overall, Instagram engagement via likes appears to correlate with higher Doximity ranking.

Discussion: Doximity reputation rankings are influenced by physician surveys, which appears to benefit larger programs. Additionally, Instagram engagement was associated with higher rank. Active social media presence, primarily on Instagram, is useful for informing applicants and influencing residency programs' Doximity reputation ranking. These results may guide program directors on how to engage prospective applicants via social media.

Supported by:

Primary Presenter / email: **Blank, Libby / ehbl223@uky.edu**  
**Professional Student (MD, PharmD, Dentistry, PT)**  
**Scholarship of Teaching & Learning**  
**Orthopedic**

Presentation **164**

Abstract Title: **Leukemic Arthritis Mimicking Septic Arthritis in a Pediatric Patient: A Case Report**

Author(s): A. Barré, Department of Orthopaedic Surgery and Sports Medicine, U of Kentucky; D. Hayes, College of Medicine, U of Kentucky; S. Dripchak, College of Medicine, U of Kentucky; R. Muchow, Department of Orthopaedic Surgery and Sports Medicine, U of Kentucky

**Abstract:** Leukemic arthritis (LA) is a rare presentation of leukemia that can closely mimic septic arthritis, presenting significant diagnostic challenges. This case report describes a 7-year-old female with developmental delay, initially presenting with a painful right knee effusion and fever. Despite inconclusive synovial fluid analysis and negative cultures, her symptoms evolved over several weeks with migratory polyarthritis. One week after initial presentation, she returned with left elbow pain, elevated inflammatory markers, and aspirate cell count concerning for infection, leading to an operative joint irrigation and debridement. Cultures remained negative, and subsequent episodes of joint effusions persisted without an identifiable cause.

After several weeks of polyarthritic symptoms and persistent elevated inflammatory markers (e.g., ESR 69 mm/hr, CRP 126 mg/L), blasts were identified, leading to the diagnosis of acute B-cell leukemia via bone marrow biopsy. Initiation of chemotherapy resolved her joint symptoms, restoring her baseline function.

This case underscores the importance of maintaining a high index of suspicion for hematologic malignancies in pediatric patients with unexplained or migratory joint symptoms, particularly when infectious and autoimmune workups are inconclusive. Awareness of LA's clinical presentation, including its potential to predate hematologic abnormalities, is vital for timely diagnosis and intervention. Early recognition can prevent unnecessary surgical interventions and ensure prompt initiation of life-saving therapies.

Awareness of this phenomenon is critical among orthopedic and pediatric providers to consider LA in the differential diagnosis of persistent joint symptoms, particularly in the absence of infection or autoimmune markers.

Supported by:

Primary Presenter / email: **Barré, Alyssa** / [alyssa.barre@uky.edu](mailto:alyssa.barre@uky.edu)  
**Medical Resident/Fellow**  
**Clinical Research**  
**Orthopedic**

Presentation **165**

Abstract Title: **Analysis of Implant Breakage in Shoulder Replacement**

Author(s): J. Chisholm, College of Medicine, U of Kentucky; S. Kamineni, Department of Orthopaedic Surgery, U of Kentucky

**Abstract:** Implant breakage is an uncommon mode of failure following shoulder arthroplasty. It is important to understand factors that are responsible for this adverse event when such a complication occurs in a patient. Following any joint arthroplasty, osteointegration of the prosthetic component must occur to distribute forces in a load sharing capacity, compared to a load bearing capacity through the implant alone. A patient with a history of postmenopausal osteoporosis presents with aseptic prosthetic humeral stem breakage following reverse total shoulder arthroplasty. Intraoperative findings included the broken implant, no osteointegration of the implant into the proximal humerus, and metallosis of surrounding soft tissues. The broken implant was extracted, followed by revision arthroplasty, additional allograft bone struts, stem cell aspirate, and demineralized bone matrix, to reinforce the construct and encourage osteointegration. With decreased estrogen production related to postmenopausal osteoporosis, there is increased osteoclastogenesis and decreased osteoblast production, which contributes to poor bone healing. Periprosthetic rubbing or fracture component motion, and contact, contributes to the release of metal debris. Foreign debris increases macrophage activity and a pro-inflammatory environment, further exacerbating a poor bone healing environment. Ultimately, the postmenopausal osteoporosis may have impaired osteointegration, contributing to a decreased ability for workload distribution between the prosthetic implant and surrounding bone, leading to fatigue failure, consequent metallosis, and implant breakage. This case report and review highlights the lack of comprehensive literature regarding optimal orthopedic treatment of osteoporotic individuals. It raises several important questions and the need for future research regarding the pathological process, and optimal management.

Supported by:

Primary Presenter / email: **Chisholm, Jacob / jgch227@uky.edu**  
**Professional Student (MD, PharmD, Dentistry, PT)**  
**Clinical Research**  
**Orthopedic**



Presentation 166

Abstract Title: **Intraoperative Platelet-Rich Plasma Reduces Tendon Re-Tears Following Rotator Cuff Tendon Repair: A Meta-analysis**

Author(s): C. Fleisher, B.S. (1); J. R. Goetz, B.S. (1); E. L. Major, B.S. (1); C. Malempati, D.O. (2); S. Badarudeen, M.D., M.P.H. (2); (1) College of Medicine, U of Kentucky; (2) Department of Orthopaedic Surgery and Sports Medicine, U of Kentucky

**Abstract:** Background: Platelet-rich plasma (PRP) has become a popular adjunct in rotator cuff tendon repair due to its potential to enhance tendon healing and reduce the risk of re-tear or reinjury. However, published studies on PRP's effectiveness have yielded conflicting results. This study aims to evaluate whether adjunct intraoperative PRP application reduces re-tear rates following rotator cuff repair.

Methods: A literature search was conducted (Cochrane Library, EMBASE, and PubMed) to identify randomized controlled trials (RCTs) examining adjunct intraoperative PRP application during rotator cuff repair surgery. Data on PRP preparation and clinical outcomes/complications were extracted and analyzed for differences in postoperative re-injury rates.

Results: A total of 12 RCTs were included in the meta-analysis, totaling 980 patients (507 in PRP cohort, 473 in control cohort). The pooled analysis demonstrated a significant reduction in re-tear rates with adjunct intraoperative PRP application, with an overall effect size of 0.890 (SE = 0.1975, Z = 4.509, p < 0.001, 95% CI: 0.503 to 1.277). Heterogeneity analysis indicated no significant between-study variability (I<sup>2</sup> = 0.00%, Q = 5.02, df = 11, p = 0.93), suggesting observed effects were consistent across studies. The odds of tendon re-tear were significantly higher in the control group compared to patients who received intraoperative PRP (OR = 2.44, 95% CI: 1.72 to 3.78).

Conclusion: This meta-analysis suggests that adjunct intraoperative application of PRP reduces postoperative tendon re-tear rates following rotator cuff tendon repair. Lower re-tear rates could translate to improved long-term functional outcomes, reduced need for revision surgeries, and overall cost-effectiveness.

Supported by:

Primary Presenter / email: **Fleisher, Christopher** / christopher.fleisher@uky.edu  
**Professional Student (MD, PharmD, Dentistry, PT)**  
**Clinical Research**  
**Orthopedic**

Presentation **167**

Abstract Title: **Reverse Total Shoulder Arthroplasty with Humeral Head Autograft Surgical Technique for Severe Glenoid Bone Loss**

Author(s): C. W. Garrison, College of Medicine, U of Kentucky; J. Bird, College of Medicine, U of Kentucky; S. Kamineni, Department of Orthopedic Surgery and Sports Medicine, U of Kentucky

**Abstract:** Introduction: Severe glenoid bone loss presents a significant challenge when considering surgical options. Various techniques have been utilized in recent history, but many come with limitations. Reverse total shoulder arthroplasty (RTSA) combined with total humeral head autograft offers a solution, providing a promising surgical option for patients with severe glenoid bone loss.

Methods: A single patient osteoarthritis was selected for single stage RTSA with humeral head autograft. The surgical technique included harvesting the humeral head autograft, preparing the glenoid surface, and securely fixing the graft to the native glenoid surface with a baseplate. The RTSA components were then placed, and postoperative imaging was performed to assess graft integration and component positioning.

Results: The patient demonstrated successful graft integration with stable fixation. Patient had a fall and suffered a scapular fracture a few weeks post-operatively. Despite the trauma, the construct remained stable. Functional outcomes post-surgery included improvement in range of motion, significant reduction in pain, and enhanced shoulder function. No complications, such as graft resorption or implant loosening, were observed during follow-up.

Conclusions: RTSA with total humeral head autograft provides an effective surgical option for managing severe glenoid bone loss. This technique allows for reliable reconstruction of the glenoid surface and offers favorable clinical outcomes in the short term. This surgical technique could potentially be used in resource-poor facilities since advanced technology or tools are not required. Further studies with larger patient cohorts are needed to confirm the long-term efficacy and potential broader applicability of this approach.

Supported by:

Primary Presenter / email: **Garrison, Clayton** / clayton.garrison@uky.edu  
**Professional Student (MD, PharmD, Dentistry, PT)**  
**Clinical Research**  
**Orthopedic**

**Presentation 168**

Abstract Title: **From Research to Rank Lists: Trends Beyond the Magic Number in Orthopaedic Surgery Residency Match**

Author(s): J.R. Goetz, U of Kentucky College of Medicine; E.L. Major, U of Kentucky College of Medicine; D.G. Shroat, U of Kentucky College of Medicine; V.P. Shah, U of Kentucky College of Medicine; A. Carroll, U of Kentucky College of Medicine; S. Badarudeen, Department of Orthopedic Surgery and Sports Medicine, U of Kentucky College of Medicine

**Abstract:** Background: Orthopaedic Surgery is a highly competitive specialty within the National Resident Matching Program (NRMP) with 26.9% of applicants failing to match in 2024. With recent changes in USMLE step 1 to a pass/fail exam, this study aims to identify current trends in Orthopaedic Surgery applicants that impact match success.

Methods: A retrospective analysis of the NRMP data to identify trends for US MD Orthopaedic Surgery applicants from 2014 to 2024, including USMLE Step 2 scores, research productivity, and the "magic number", which is the number of programs an applicant must rank to achieve a greater than 90% probability of matching.

Results: The number of Orthopaedic Surgery applicants has risen from 994 applicants in 2014, to 1,492 applicants in 2024. The ratio of US MD applicants to available residency positions has not significantly changed from 2014 (1.43) to 2024 (1.58) ( $p = 0.172$ ). Despite the rise in applicants, the overall US MD match rate has not significantly changed ( $p = 0.338$ ).

Matched applicants showed a significant increase in USMLE Step 2 scores ( $p = 0.002$ ), research publications ( $p = 0.001$ ), and experiences ( $p < 0.001$ ). For unmatched applicants, research publications ( $p = 0.005$ ) and experiences ( $p = 0.006$ ) significantly increased, but Step 2 scores did not increase ( $p = 0.084$ ). The "magic number" increased from 12 in 2014, to 13 in 2024 ( $p = 0.361$ ).

Conclusion: Our analysis highlights the increasing competitiveness of the Orthopaedic Surgery residency match, with USMLE Step 2 and research productivity playing significant roles in match outcomes. Applicants must excel across various academic dimensions to optimize their chances of matching.

Supported by: None

Primary Presenter / email: **Goetz, James / jrgo244@uky.edu**  
**Professional Student (MD, PharmD, Dentistry, PT)**  
**Scholarship of Teaching & Learning**  
**Orthopedic**

**Presentation 169**

Abstract Title: **A Novel Adduction-Related Mechanism of Shoulder Dislocation in Obese Patients with Shoulder Arthroplasty**

Author(s): L. Harris, University of Kentucky College of Medicine; S. Kamineni, Departments of Orthopedic Surgery and Sports Medicine, University of Kentucky

**Abstract:** Shoulder dislocation is a recognized complication of shoulder and reverse shoulder arthroplasty, typically occurring through an anterior-superior mechanism. This study aims to describe and analyze a novel mechanism of shoulder dislocation in obese patients with shoulder or reverse shoulder replacements. Unlike the traditional anterior-superior mechanism of dislocation, this unique form occurs due to an adduction movement caused by the accumulation of adipose tissue in the lateral axilla and medial arm. This buildup exerts an atypical stress on the arthroplasty, which would not be present in patients of normal weight or without significant fat deposits in these regions.

The study will consist of a case series of approximately five patients who meet the specified criteria. The primary objective is to identify and characterize the clinical presentations and radiographic findings associated with this mechanism of dislocation. Additionally, a basic science component will involve using Dr. Kamineni's biomechanics lab to describe the geometric and biomechanical factors contributing to this unique mechanism of dislocation in obese patients.

We hypothesize that obesity increases the risk of this distinct dislocation mechanism due to adipose-related mechanical stress. Findings from this study will fill a critical gap in the literature, inform surgical decision-making, improve prosthesis design, and enhance postoperative management strategies to mitigate dislocation risk.

Supported by: NIH CTSA grant (UL1TR001998)

Primary Presenter / email: **Harris, Landon** / [lmha294@uky.edu](mailto:lmha294@uky.edu)  
**Professional Student (MD, PharmD, Dentistry, PT)**  
**Clinical Research**  
**Orthopedic**

Presentation **170**

Abstract Title: **Quantitative Comparison of Femoral Head Exposure: Anterior Approach versus Trochanteric Flip Osteotomy**

Author(s): A. Barré, Dept of Orthopaedic Surgery and Sports Medicine, U of KY; D. Hayes, College of Medicine, U of KY; A. Coskey, Dept of Orthopaedic Surgery and Sports Medicine, U of KY; R. Wright, Dept of Orthopaedic Surgery and Sports Medicine, U of KY; E. Moghadamian, Dept of Orthopaedic Surgery and Sports Medicine, U of KY; W. Charlton, Dept of Orthopaedic Surgery and Sports Medicine, U of KY; P. Matuszewski, Dept of Orthopaedic Surgery and Sports Medicine, U of KY

**Abstract:** Background: Surgical treatment of femoral head fractures remains controversial due to variable outcomes and a lack of consensus on optimal approaches. The modified Smith-Peterson (anterior) and surgical hip dislocation with trochanteric flip osteotomy (TFO) are two commonly utilized techniques to approach the femoral head. This study aims to quantitatively compare femoral head exposure provided by these approaches in a cadaveric model.

Methods: Eight hips from four cadaveric specimens were dissected using the anterior and TFO approaches on opposite hips. Surface area exposure of the femoral head was marked and digitally analyzed using ImageJ software. Exposable surface area percentages were calculated and compared using independent t-tests.

Results: The TFO approach provided significantly greater femoral head exposure, accessing 81% of the total surface area compared to 58% with the anterior approach ( $p=0.0154$ ). In the anterior half of the femoral head, TFO exposed 70% versus 49% for the anterior approach ( $p=0.0138$ ). Exposure differences in the posterior, cranial, and caudal halves did not achieve statistical significance. TFO also facilitated better visualization of posterior pathology.

Conclusion: The TFO approach offers superior exposure to the femoral head, particularly in the anterior half, which may improve fracture reduction and fixation. These findings provide additional resources for surgeons when selecting surgical approaches based on fracture location and patient needs. Future research should evaluate the clinical implications of these findings and explore three-dimensional exposure quantification.

Supported by:

Primary Presenter / email: **Hayes, Daniel / danielhayes@uky.edu**  
**Professional Student (MD, PharmD, Dentistry, PT)**  
**Clinical Research**  
**Orthopedic**

**Presentation 171**

**Abstract Title: Secondary Displacement of Nonoperatively Managed Greater Tuberosity Fractures: Rates, Risk Factors, and Range of Motion**

**Author(s):** A.T. Gregg, Harvard Medical School; C. R. Sierra-Arce, MGH; M. Muhammad, MGH; K. M. Kraus, University of Kentucky College of Medicine; A. Musick, MGH; T. J. Policicchio, MGH; R. K. Wagner M.D., MGH - Department of Orthopedic Surgery; D. S. Stenquist M.D., MGH - Department of Orthopedic Surgery; Mitchel B. Harris M.D., MGH - Department of Orthopedic Surgery; Thuan V Ly M.D, MGH - Department of Orthopedic Surgery; Arun Aneja M.D, MGH - Department of Orthopedic Surgery;

**Abstract:** Greater Tuberosity (GT) fractures are a common proximal humerus fracture that is often treated non-operatively. However, secondary displacement of the fracture fragment is a concern, along with malunion or loss of function. Our study aimed to determine the rate of secondary displacement for non-operatively managed greater tuberosity (GT) fractures via examination of radiographic data, ROM, and patient specific risk factors.

**METHODS:** Retrospective Cohort Study at Two Level 1 Trauma Centers.

Adult patients with GT fractures managed non-operatively between 2010 and 2023 with a minimum follow-up of 6 weeks.

**Outcomes:** The primary outcome was the rate of secondary displacement. Secondary displacement was defined as a superior GT position (GT ratio  $\geq 0.5$ ) at final follow-up for fractures initially positioned inferiorly or intermediately (GT ratio  $< 0.5$ ). Secondary objectives were to compare rates of displacement between isolated GT fractures and GT fracture-dislocations, identify risk factors, and compare ROM between patient groups.

**RESULTS:** 115 patients (70% female), median age of 57 years, and median follow-up of 104 days were included. Isolated GT fractures accounted for 81 (70%) cases, while 34 (30%) were GT fracture-dislocations. Among 104 initially inferiorly/intermediately positioned GT fractures, 11 (11%) experienced secondary displacement. There was no difference in rates of secondary displacement between isolated GT fractures (n=7, 9.2%) and fracture-dislocations (n=4, 14%) (p=0.482). There were no differences in forward flexion, abduction, or external rotation between patients who had secondary displacement and those who did not (p>0.05).

**CONCLUSION:** Approximately 1 in 10 greater tuberosity (GT) fractures initially meeting criteria for nonoperative management experience secondary displacement. Secondary displacement rates are similar between patients with isolated GT fractures and fracture-dislocations.

Supported by:

Primary Presenter / email: **Kraus, Kameron / kmkr245@uky.edu**  
**Professional Student (MD, PharmD, Dentistry, PT)**  
**Clinical Research**  
**Orthopedic**

Presentation **172**

Abstract Title: **The Peritalar Joint Congruence in Pediatric Flexible Flatfoot Deformity and Normal Controls: A 3D Weightbearing CT Study**

Author(s): J. Ramirez, Departments of Orthopedics, U of Kentucky, J. Huang, Departments of Orthopedics, U of Colorado; M. Zhu, Departments of Orthopedics, U of Colorado; S. Huo, Departments of Orthopedics, U of Colorado; M. Myerson, Departments of Orthopedics, U of Colorado; Shuyuan Li, Departments of Orthopedics, U of Colorado

**Abstract:** Peritalar subluxation, characterized by incongruity in the talonavicular and calcaneocuboid joints, as well as the three facets of the subtalar joint, has recently gained attention in adult flatfoot deformity studies. While it is reported that peritalar subluxation in adults is more physiologic than pathologic, its role in pediatric flatfoot deformities remains unclear. This study uses weightbearing CT scans to compare peritalar subluxation in symptomatic flexible pediatric flatfeet and control feet, aiming to differentiate physiologic from pathologic subluxation in children.

Weightbearing CT scans from 12 flexible pediatric flatfeet (average age 10.33 years; range 7-12 years) and 6 control feet (average age 13.17 years; range 12-15 years) were retrospectively reviewed. Flatfoot deformities with an accessory navicular were excluded. Peritalar bones were segmented using Mimics software and analyzed in Geomagic Studio 10 to map bony articular surfaces and quantify joint uncoverage as an indicator of subluxation. Comparisons were made between flatfoot and control groups, with adult control data as a reference.

In non-deformed pediatric feet, physiologic peritalar subluxation was observed, particularly in the talonavicular joint (12.82% uncoverage on the navicular side, 32.14% on the talar side) and the anterior/middle facets of the subtalar joint (33% on the talar side, 48.6% on the calcaneal side). Flexible flatfeet showed significantly greater subluxation: 25.73% on the navicular side of the talonavicular joint and 65.78% on the talar side of the subtalar joint. Physiologic subluxation in children was generally greater than in adults.

In conclusion, physiologic peritalar subluxation exists in normal pediatric feet, but is significantly increased in flexible flatfoot deformities, indicating a pathologic condition. This study is the first to quantify physiologic and pathologic peritalar subluxation in children, offering new insights into pediatric flatfoot deformities

Supported by:

Primary Presenter / email: **Ramirez, Joshua** / [jcra242@uky.edu](mailto:jcra242@uky.edu)  
**Professional Student (MD, PharmD, Dentistry, PT)**  
**Clinical Research**  
**Orthopedic**

Presentation **173**

Abstract Title: **Outcomes Following Distal Femur Replacement for Fracture: A Multi-Institutional Retrospective Review**

Author(s): D.C. Landy, OrthoVirginia/Liberty University; W.G.S. Southall, U of Kentucky;; S.T. Duncan, U of Kentucky; M.T. Archdeacon, U of Cincinnati; W.T. Obremskey, Vanderbilt University Medical Center; J.M. Lawrenz, Vanderbilt University Medical Center; C. Lee, U of California Los Angeles; M.S. Sridhar, Prisma Health - Upstate; J.A. Foster, Wake Forest University School of Medicine; A. Aneja, Massachusetts General Hospital; DFR Research Group

**Abstract:** Purpose: Distal femur replacement (DFR) is increasingly used to treat distal femur fractures (DFFs), especially for patients with limited bone stock, poor bone quality, and advanced age. While DFR does not rely on bony healing and allows early weight bearing, complications can be devastating, especially periprosthetic joint infection (PJI). Meta-analytic studies have reported lower than expected complication rates but may be limited by publication bias. The objective of this study was to estimate outcomes of patients who underwent DFR for DFF. Methods: A retrospective cohort study was conducted at twelve academic trauma centers. Adult patients who underwent DFR for native or periprosthetic DFF from 2010 to 2022 were identified, with infectious, oncologic, and any other indications excluded. The primary outcome was PJI. Secondary outcomes included reoperation, mortality, and function.

Results: In total, 173 patients were included with 130 (75%) having a periprosthetic DFF. Patients were older (median age 77 years, interquartile range 70-84), women (84%), and had more severe co-morbidities (63% ASA class III and 24% ASA class IV). The rate of PJI was 5.8% (95% CI, 3.1-10.5%), and this was lower for native compared to periprosthetic DFF though not statistically significant (2.3% vs. 6.9%, P = 0.45). The reoperation rate was 16.6% (95% C.I., 11.7-23.0%) and one-year mortality 27% (95% C.I., 20-35%). Slightly more than half of patients returned to their baseline function at 54.6% (95% C.I., 46.9-62.1%).

Conclusion: DFR for DFF was associated with a PJI rate of 5.8%. The one-year mortality rate was 27.0% and reoperation rate was 16.6%. Slightly more than half of patients returned to their baseline function at 54.6%. DFR can be considered as a salvage option in cases of complex native and periprosthetic DFF, though surgeons should continue to counsel patients on the considerable risks, particularly mortality, associated with DFR when assessing treatment options for DFF.

Supported by: NIH CTSA grant (UL1TR001998) from from UK Center for Clinical and Translational Science

Primary Presenter / email: **Southall, Wyatt** / wyatt.southall@uky.edu  
**Professional Student (MD, PharmD, Dentistry, PT)**  
**Clinical Research**  
**Orthopedic**



**Presentation 174**

Abstract Title: **Elevating Survivorship: Quality Improvement for Head and Neck Cancer Patients at Markey Cancer Center**

Author(s): J. T. Leon, College of Medicine, U of Kentucky; M. Windon, Department of Otolaryngology-Head and Neck Surgery, U of Kentucky

**Abstract:** Introduction: Head and neck cancer patients are recommended to follow up to ensure survivorship. Unfortunately, most do not follow through with these visits. The quality improvement research project focuses on investigating compliance to select survivorship guidelines based on the American Head and Neck Society guidelines through a retrospective chart review and implementing an intervention to improve compliance. Methods: Deidentified data from Markey Cancer Center was collected through University of Kentucky's Center for Clinical and Translational Science. The patient population was grouped based on treatment type. Other data variables included completion and date of thyroid function testing, chest CT scans, PET-CT scans, audiology referrals, and audiology visits. The project calculated the percentage of patients that completed the measures and how many were compliant with the guidelines.

Results: Of 469 patients, 384 (81.9%) patients had a TSH lab performed. Of those, 379 (98.7%) completed their TSH lab within the guideline. Of all patients, 446 (95.1%) patients completed a CT scan. Of those, 383 patients (90.1%) completed the scan within the guideline.

Conclusions: Chest CT scan compliance was better than expected. TSH lab compliance was also better than expected, but there is room for improvement. In the project's next step, the study team will gather data related to PET CT scans and audiology from Markey Cancer Center's Cancer Research Informatics Shared Resource. The team believes there is more opportunity for quality improvement in these areas. Based on these results and stakeholder input, an intervention will be created to continue to ensure patient survivorship.

Supported by: The project described was supported by the NIH National Center for Advancing Translational Sciences through grant number UL1TR001998. The content is solely the responsibility of the authors and does not necessarily represent the official views of the NIH. The Professional Student Mentored Research Fellowship (PSMRF) Project is supported by the National Center for Advancing Translational Sciences through Grant UL1TR001998, UK HealthCare and the University of Kentucky College of Medicine. The content is solely the responsibility of the authors and does not necessarily represent the official views of the NIH.

Primary Presenter / email: **Leon, Jacqueline** / j.leon@uky.edu  
**Professional Student (MD, PharmD, Dentistry, PT)**  
**Quality Improvement**  
**Otolaryngology**

Presentation **175**

Abstract Title: **Reporting of Sociodemographic Data in Vestibular Schwannoma: A Systematic Review**

Author(s): A. Marcelletti, College of Medicine, U of Kentucky; C. Bobo, College of Medicine, U of Kentucky; E. Smith, College of Medicine, U of Kentucky; G. Beharry, College of Medicine, U of Kentucky; C. Robinson, College of Medicine, U of Kentucky; C. Robinson, College of Public Health, U of Kentucky; N. Cass, Department of Otolaryngology-Head & Neck Surgery, U of Kentucky; M. Bush, Department of Otolaryngology-Head & Neck Surgery, U of Kentucky

**Abstract:** Vestibular schwannoma (VS), a benign tumor arising from the Schwann cells of the eighth cranial nerve, is the third most prevalent intracranial nonmalignant tumor and poses significant risks due to its mass effect on intracranial structures. Despite its prevalence, the impact of sociodemographic factors on VS management and outcomes remains underexplored. This systematic review aims to evaluate the frequency of sociodemographic data reporting in VS literature. We hypothesize that few articles report comprehensive sociodemographic data. Using the PICO framework, relevant articles will be systematically reviewed and analyzed. Descriptive statistics, chi-square tests, and logistic regression analysis will be employed to assess trends in literature and subgroups. Subgroup analyses will include decadal divisions (e.g., 1980s, 1990s, 2000s, etc.) using chi-square tests for trends to evaluate changes in sociodemographic reporting practices over time. Using chi-square tests and logistic regression, we will compare reporting frequency across different study designs to determine if sociodemographic reporting varies significantly. Differences in reporting between academic and nonacademic settings will be explored using chi-square tests and logistic regression with individual-level data. Variations across different countries or regional groupings will be examined using chi-square tests and multinomial logistic regression, accounting for potential confounders. This review is the first to investigate the reporting frequency of sociodemographic data in VS literature, addressing a critical gap and advocating for enhanced research practices. Potential findings will highlight current deficiencies in reporting practices and provide evidence to support the implementation of standardized sociodemographic data reporting, ultimately contributing to more equitable and comprehensive VS research.

Supported by: NIH CTSA grant (UL1TR001998)

Primary Presenter / email: **Marcelletti, Anthony** / [anthony.marcelletti@uky.edu](mailto:anthony.marcelletti@uky.edu)  
**Professional Student (MD, PharmD, Dentistry, PT)**  
**Translational Research/Science**  
**Otolaryngology**

Presentation **176**

Abstract Title: **AppSTAR Implementation Insights from the 2023-2024 School Year**

Author(s): Monica McGrath\*, College of Medicine, U of Kentucky; Jacqueline Leon\*, College of Medicine, U of Kentucky; Tarika Srinivasan, BSA, BA, Harvard Medical School; Hannah Lane, PhD, Department of Population Health Sciences, Duke U; Samantha K. Robler, AuD, PhD, Department of Otolaryngology, U of Arkansas for Medical Sciences; Susan D. Emmett, MD, MPH, Department of Otolaryngology, U of Arkansas for Medical Sciences; Matthew L. Bush, MD, PhD, MBA, Department Otolaryngology, U of Kentucky

**Abstract:** Childhood hearing loss is a global health problem that disproportionately affects rural children and if untreated, can lead to poor academic performance and social development. The Appalachian Specialty Telemedicine Access for Referrals (AppSTAR) trial is an NIH-funded hybrid effectiveness-implementation trial studying enhanced hearing screening and telemedicine referral in elementary schools in a resource limited region of Appalachian Kentucky. For the 2023-24 school year, we delivered AppSTAR equipment and training for hearing screening using otoacoustic emissions and tympanometry to school-based screeners in 30 schools across 7 counties in Kentucky. After schools conducted screenings, semi-structured interviews were conducted to assess barriers and facilitators across multiple levels (intervention, individuals, inner and outer setting). Participants included 21 school screeners representing all 7 counties. Perceived barriers at the intervention level included user error in tympanometry, duration of screening tests, and difficulty uploading results to school records systems. Facilitators included working in groups and conducting screening early in the year. Inner and outer setting factors affecting screening implementation included student absences/illness, difficulties connecting screening tablets to rural school Wi-Fi, and delays in obtaining student rosters from school districts prior to commencing screening. Screeners expressed a strong perception of appropriateness and acceptability regarding implementation of the AppSTAR protocol and equipment to improve ear/hearing health outcomes in rural school children. This research provided critical feedback and enabled data-driven adaptations to AppSTAR model for integration in this current school year. Understanding contextual characteristics of participating counties may ensure better integration of health technologies in rural school settings.

Supported by: NIH NIDCD Grant #U01OD033247

Primary Presenter / email: **McGrath, Monica** / mmmc289@uky.edu  
**Professional Student (MD, PharmD, Dentistry, PT)**  
**Dissemination & Implementation Research**  
**Otolaryngology**

Presentation **177**

Abstract Title: **The Impact of Hearing Aids on Cognitive Health in Hearing-Impaired Adults: A Scoping Review**

Author(s): E. Smith, College of Medicine, U of Kentucky; C. Bobo, College of Medicine, U of Kentucky; J. D. Johnson, College of Medicine, U of Kentucky; A. Marcelletti, College of Medicine, U of Kentucky; O. Rehal, Department of Otolaryngology, U of Kentucky; L. E. Robinson, Medical Center Library, U of Kentucky; B. Reeder, Medical Center Library, U of Kentucky; M. Bush, Department of Otolaryngology, U Kentucky, Lexington, KY

**Abstract:** Background: Age-related hearing impairment (ARHI) is a major public health concern and a potential modifiable risk factor for cognitive decline. While previous reviews have explored the relationship between hearing loss and cognition, they have largely overlooked research from allied health disciplines. This scoping review aims to provide a comprehensive synthesis of the cognitive outcomes associated with hearing aid use, incorporating evidence from both medical and allied health literature.

Methods: Following Arksey and O'Malley's framework, we systematically searched MEDLINE, PubMed, CINAHL, and EMBASE for peer-reviewed studies published from 1990 to the present. Studies examining the effects of hearing aids or cochlear implants on cognitive health in adults were included. Title/abstract screening yielded 33,977 results, with 242 full-text articles under review. To date, 110 full texts have been analyzed, with 26 included in synthesis.

Preliminary Findings: Early results suggest hearing aids may mitigate cognitive decline through mechanisms such as improved auditory processing, reduced cognitive load, and enhanced communication, potentially decreasing social isolation. Our inclusion of allied health literature has provided unique insights into rehabilitation strategies and multidisciplinary approaches that may further support cognitive health.

Conclusion: This review underscores the importance of integrating allied health research in understanding the cognitive effects of hearing aids and cochlear implants. Findings highlight the need for further longitudinal studies to establish causality and inform clinical practice.

Supported by: PSMRF: The project described was supported by the National Center for Advancing Translational Sciences, through Grant UL1TR001998. The content is solely the responsibility of the authors and does not necessarily represent the official views of the NIH.

Primary Presenter / email: **Smith, Evan / eksm236@uky.edu**  
**Professional Student (MD, PharmD, Dentistry, PT)**  
**Clinical Research**  
**Otolaryngology**

Presentation **178**

Abstract Title: **To Admit or Not to Admit: Age and Apnea Development in Pediatric RSV Patients**

Author(s): D. M. Howell, College of Medicine, U of Kentucky; E. H. Blank, College of Medicine, U of Kentucky; V. Gouge, Department of Pediatrics, U of Kentucky; M. Stoddart, Department of Pediatrics, U of Kentucky; R. Baum, Department of Emergency Medicine, U of Kentucky; J. Zummer, Departments of Emergency Medicine and Pediatric Emergency Medicine, U of Kentucky

**Abstract:** Introduction: Standard emergency department management is to admit all patients younger than 1 month who test positive for respiratory syncytial virus (RSV). This practice is based on a perceived increase in apnea risk in this age group, regardless of clinical condition or symptoms. Recent evidence questions this notion. This investigation aims to evaluate whether age is an independent risk factor for apnea development in RSV-positive pediatric patients and determine if these patients require hospitalization.

Methods: This study is a retrospective chart review of patients less than 24 months old who presented to University of Kentucky Children's Hospital's emergency department with RSV infection between June 6, 2021, and September 11, 2024. Clinical data including age at presentation, gestational age at birth, admission status, comorbidities, respiratory support, and apnea incidence was collected.

Results: Data analysis is ongoing at this time, but our patient cohort has been preliminarily identified. The population consists of 2,809 patients ranging from 5 days to 24 months of age. 1,120 (39%) patients were admitted to the hospital, including 225 (8%) to the ICU. We plan to conduct further analysis to determine the proportion who developed apnea, and associated risk factors including age.

Discussion: The large admission burden for RSV-positive infants during peak season imposes a significant cost to hospitals, patients, and families, and there is currently little evidence supporting the widely-taught practice of admitting younger, otherwise well patients due to a potential risk of apnea. We hope to provide evidence to support or refute this practice.

Supported by: NIH CTSA grant (PSMRF program): UL1TR001998

Primary Presenter / email: **Howell, Davis** / dmho260@uky.edu  
**Professional Student (MD, PharmD, Dentistry, PT)**  
**Clinical Research**  
**Pediatrics**

Presentation **179**

Abstract Title: **Environmental Contributions to Cardiovascular Risk in Children with Elevated Blood Pressure: Preliminary Findings**

Author(s): M.O. Murphy, Department of Pediatrics, UK; W. Sanderson, Department of Epidemiology, UK; H. Huang, Department of Pediatrics, UK; A. Schadler, Department of Pediatrics, UK; S.G. Kiessling, Department of Pediatrics, UK; A.S. Chishti, Department of Pediatrics, UK; S.E. Clark, Department of Pediatrics, UK; Y. Alsiraj, Department of Pediatrics, UK; R. Shoemaker, Department of Pediatrics, UK; Jody Clasey, Department of Kinesiology and Health Promotion, UK; J.A. Bauer Department of Pediatrics, UK

**Abstract:** Background: There is growing evidence that exposure to particulate matter (PM<sub>2.5</sub>) is linked to cardiovascular mortality; however, few studies have assessed indoor air quality in early cardiovascular risk in children. The aim of this study is to investigate relationships among indoor air quality and cardiovascular risk in children.

Methods: With IRB approval, we recruited patients ages 8-18 years who were referred to KCH Pediatric Nephrology clinic for evaluation of elevated BP. Exclusion criteria included chronic kidney disease, congenital heart disease, and use of antihypertensive medications. Obesity was defined by BMI percentiles according to CDC guidelines and LV mass was assessed by echocardiography. For indoor air sampling, PM<sub>2.5</sub> size-selective samplers attached to sampling pumps calibrated at 4 L/min were set up in the family's living room for a 4-day period and environmental surveys were completed.

Results: We have recruited 26 patients and completed 12 in-home air sampling visits with 58% of these in Appalachian counties. The mean age is  $14.1 \pm 2.5$ , 73% male, 69% Caucasian, 81% (n=21) obese, 65% (n=17) having stage 1 or stage 2 hypertension with 45% displaying a non-dipping status, and 81% prevalence of left ventricular hypertrophy (LVH). Mean PM<sub>2.5</sub> exposure level was  $16.7 \mu\text{g}/\text{m}^3 \pm 11.5$  with 2 homes above EPA standards ( $>35 \mu\text{g}/\text{m}^3$ ); PM<sub>10</sub>:  $16.9 \mu\text{g}/\text{m}^3 \pm 6.1$ , CO<sub>2</sub> average:  $794.3 \text{ ppm} \pm 345.2$  with 9 homes having CO<sub>2</sub> maximum levels above EPA standards ( $>1000 \text{ ppm}$ ). 54% (n=14) report second-hand smoke exposure and 29% (n=8) food insecurity.

Conclusions: These findings confirm the high incidence of early cardiovascular risk evidenced by obesity, hypertension, and LVH in children referred for elevated BP. An association between exposure to PM<sub>2.5</sub> and cardiovascular disease in these patients will continue to be evaluated. This study may serve as a model to study environmental exposures and health outcomes in other high-risk patient groups including premature infants.

Supported by: This study is funded by NIEHS K23ES034462.

Primary Presenter / email: **Murphy, Maggie** / momurp3@uky.edu  
**Faculty**  
**Clinical Research**  
**Pediatrics**

**Presentation 180**

Abstract Title: **Sex Differences in Associations among Cardiometabolic Risk Factors and Serum Steroids in Adolescents with Obesity**

Author(s): R. Shoemaker, M. Murphy, H. Huang, Y. Alsiraj, A. Schadler, A. Radulescu, J.A. Bauer,  
Department of Pediatrics, U of Kentucky.

**Abstract:** Background: Knowledge of mechanisms underlying the development of obesity with comorbid conditions in youth is urgently needed. We examined associations among concentrations of steroid hormones in serum with cardiometabolic risk factors (elevated blood pressure, blood glucose, total cholesterol to high density lipoprotein ratio, blood urea nitrogen, or ALT and or AST) in girls and boys with obesity.

Methods: We recruited 82 adolescents (ages 12-17) with BMI greater than the 95th percentile from the High BMI Clinic. Clinical data and blood samples were collected at the initial clinic visit. Serum concentrations of glucocorticoids, mineralocorticoids, and sex hormones were quantified using liquid chromatography with mass spectrometry. Data were grouped by sex (42 boys and 40 girls), and analyzed using 2-way ANOVA and uni/multivariate analysis.

Results: Both boys and girls with high BMI exhibited multiple cardiometabolic risk factors; 82% from each group had three or more cardiometabolic risk factors. Sex differences were observed, where girls had higher diastolic blood pressure compared to boys (69.4 + 8.6 versus 66.4 + 5.1 mmHG;  $P < 0.05$ ), and boys had higher ALT and AST levels and higher blood urea nitrogen. Age-adjusted analysis revealed greater serum concentrations in girls compared to boys of cortisol (100.3 + 69.8 versus 63.0 + 28.9 ng/mL;  $P < 0.05$ ), and other sex differences among aldosterone (272.5 + 369.9 in girls versus 148.3 + 107.9 pg/mL in boys;  $P < 0.05$ ) and sex hormones (androstenedione, testosterone, and estrogen). There was a significant interaction between sex and cortisol ( $p=0.023$ ) for diastolic blood pressure in girls, but not boys.

Conclusions: Sex differences exist in cardiometabolic risk factors and co-existing conditions in adolescents with obesity. This may be partly attributed to differences in the interactions among sex hormones and gluco- and mineralocorticoids on blood pressure and other pathways associated with increased adiposity.

Supported by:

Primary Presenter / email: **Shoemaker, Robin** / robin.shoemaker@uky.edu  
**Faculty**  
**Translational Research/Science**  
**Pediatrics**

**Presentation 181**

Abstract Title: **Leveraging Managed Care Partnerships: Lessons Learned from Washington DC's Healthy Together Medical-Legal Partnership**

Author(s): K. B. Collins, College of Medicine, U of Kentucky; T. Goodman, Director, Healthy Together; M. Casoni, MSL, MPH, The George Washington University; K. Marple, MSc, Principal Consultant, Who Tells the Story?; B. Hamilton, JD, Director, National Center for Medical-Legal Partnership; L. Eisele, JD, U of Kentucky; K. Northrip, MD, MPH, U of Kentucky; J. Edward, PhD, RN, College of Nursing, U of Kentucky

**Abstract:** Medical-legal partnerships (MLPs) are evidence-based programs designed to improve patient outcomes and reduce costs by embedding legal professionals in healthcare settings to address health-harming legal issues and to educate clinicians on how to identify patients facing these concerns. Medicaid dollars offer a potential funding mechanism that could support the longevity needed for these MLP programs. This study performed interviews with Healthy Together, a well-established MLP, and AmeriHealth Caritas, DC's largest Medicaid managed care organization (MCO), to gain insight into best practices for establishing MLP-MCO partnerships. This study aims to present this data to inform policy reform and to present Healthy Together as a model for MLPs seeking to form sustainable partnerships with MCOs by highlighting the importance of data collection for demonstrating the impact of the MLP model. Healthy Together has partnered with multiple healthcare systems in the DC area and has expertise in a broad range of health-harming legal needs such as housing and Medicaid denials. An evaluation director collects and analyzes data on legal service delivery, services, and outcomes. They have demonstrated that their MLP has been able to drive down healthcare costs by up to \$60,000 for children with asthma. This, along with other data demonstrating the efficacy of MLPs, ultimately helped forge the relationship between Health Together and AmeriHealth Caritas, successfully forming the first-in-nation partnership between a MLP and a Medicaid MCO. Findings have several implications for future policy changes around value-based financing and building sustainable partnerships between community legal service organizations, MLPs and Medicaid MCO's.

Supported by: University of California Davis, Betty Irene Moore School of Nursing

Primary Presenter / email: **Collins, Katelyn** / kbco253@uky.edu  
**Professional Student (MD, PharmD, Dentistry, PT)**  
**Community Research**  
**Policy**



Presentation **182**

Abstract Title: **Patient Reported Outcomes of Gamma Knife Radiosurgery for Intracranial AVMs & Fistulas: A Retrospective Study**

Author(s): D. Foltz, M. E. Arbogast, W. S. Clair, MD, PhD, D. Dornbos, MD, J. F. Fraser, MD, and D. Pokhrel, PhD; Department of Radiation Medicine, University of Kentucky; Department of Neurosurgery, University of Kentucky

**Abstract:** Purpose: Gamma Knife stereotactic radiosurgery (SRS) is an effective and minimally invasive treatment option for intracranial arteriovenous malformations (AVM) and arteriovenous fistulas (AVF). This study presents long-term outcomes of patients treated with GammaPlan SRS on GK PerfexionTM. Methods/Materials: This IRB approved retrospective study included 112 patients with AVMs or AVFs treated with Gamma Knife SRS between 2010 and 2024. Highly conformal SRS plans were created using contrast-enhanced angiograms and lightning dose optimizer using MRI. Average nidus size was  $7.6\pm 13.6$  cc, and the mean marginal dose was  $19.3\pm 2.6$  Gy. Treatment plans were evaluated using Paddick conformity and gradient indices, with dosimetric parameters assessed for the brainstem, optic pathway, and normal brain. Patients were followed up at six-month intervals.

Results: Of the 112 patients, 70 followed up (average follow-up interval of  $63\pm 49$  months). 36 (51.4%) were female and 34 (48.6%) males. Average Paddick conformity index was  $0.63\pm 0.11$ . Symptomatic improvement occurred in 54 (77.1%) patients, while 16 (22.9%) with higher SM grades showed no improvement. Radiologic outcomes showed normal brain necrosis in 11 patients, optic pathway necrosis in one, and brainstem necrosis in one. Most brain radionecrosis occurred in female patients with large AVMs.

Radionecrosis patients were managed with steroids, pentoxifylline, and Vitamin E or intra-arterial Avastin.

Conclusions: Gamma Knife SRS is an effective treatment for AVM and AVF with a lower incidence of radiation-induced side effects. Brain radionecrosis was more common in females with larger AVMs, however, suggesting opportunities for treatment optimization for future AVM/AVF patients.

Supported by:

Primary Presenter / email: **Foltz, Denise** / [dafo233@uky.edu](mailto:dafo233@uky.edu)  
**Professional Student (MD, PharmD, Dentistry, PT)**  
**Clinical Research**  
**Ra**

Presentation **183**

Abstract Title: **Enhancing Efficiency in a High-Volume Radiology Clinic: Modern Modeling Approach to Scheduling and Resource Optimization**

Author(s): Li, W., J. Tinnell, O. Whitfield and X. Wang

**Abstract:** Purpose: Develop an operational model to optimize patient flow and resource utilization in busy breast imaging clinics (BIC). The model seeks to enhance clinic efficiency by improving operational processes.

Methods: 12 months of patient processing and scheduling data within UK's BIC was extracted across four stages within services including screening mammography, diagnostic mammography and ultrasound, and image guided intervention. These stages included check-in, exam start, exam end, and check-out. Key performance indicators (KPIs) including last turnaround time (LTAT), total turnaround time (TTAT), and variance of turnaround time (VTAT) evaluated service quality. These KPIs were found to be inconsistent with each other requiring the modern portfolio theory to balance trade-offs and subsequently applied to maximize efficiency of scheduling. To do this, eleven Current and Future Deviation CFD( $\alpha$ ) heuristics with  $\alpha = 0.0, 0.1, \dots, 1.0$  (Li et al., 2019) were compared. Each of the 11 heuristics assign varying weights for each KPI. Heuristics were compared to BIC's current scheduling method.

Results: Patient time was primarily spent between exam end and check out, indicating a point of improvement. Among tested CFD heuristics, three were identified that minimized tradeoff expected value, decreasing service times effectively. The CFD heuristics has potential improvements of 1.92% on LTAT or process utilization, 52.56% on TTAT or patient flow, and 37.72% in VTAT over BICs current method.

Conclusion: This novel approach balances trade-offs between inconsistent KPIs, either for individual stages or for a serial service process, allowing for increased efficiency and is translatable to other BICs.

---

Supported by:

---

Primary Presenter / email: **Whitfield, Olivia** / oawh225@uky.edu  
**Professional Student (MD, PharmD, Dentistry, PT)**  
**Clinical Research**  
**Radiology**

---

**Presentation 184**

Abstract Title: **Treatment of OCP induced Hepatocellular Adenomas with Y90 radioembolization: A case study**

Author(s): J. Duvall, University of Kentucky College of Medicine; R. Lawless, University of Kentucky College of Medicine; Y. Alrefai, University of Kentucky College of Medicine; Elias El-Haddad, Department of Vascular & Interventional Radiology, U of Kentucky

**Abstract:** Hepatocellular adenoma (HCA) is a benign epithelial hepatic neoplasm that is linked to exogenous estrogen intake. The most commonly accepted etiology of this process is estrogen induced stimulation of hepatocyte growth by activating nuclear receptors which in turn increases transcription of mitogenic factors, promoting cellular proliferation. HCAs carry a high risk of malignant transformation and hemorrhage; therefore, care should be taken to accurately diagnose and treat patients with these lesions to limit potential complications. Patients with HCA typically present asymptotically with the finding being found incidentally on imaging. However patients may present with acute RUQ pain, epigastric pain, bloating, and hepatomegaly. If an HCA ruptures patients may present with symptoms resembling cholecystitis. Commonly, imaging and biopsy are diagnostic for the condition.

We present the case of a 30 year old female who presented to the emergency department with a case of gastroenteritis. Lab testing was performed, and a significant increase in the patient's ALP was found. Following discharge from treatment of the gastroenteritis, an abdominal ultrasound was performed, which demonstrated hepatomegaly and diffuse heterogeneous echotexture with several intrahepatic mass lesions. Subsequent CT and MRI imaging, as well as liver biopsy were diagnostic for hepatic adenomatosis, and various treatment options were considered. Due to the large size of the nodules, surgical resection was not recommended. Using shared decision making with the patient, y90 radioembolization was chosen to decrease the risk of bleeding and preserve liver parenchyma. The patient was also consulted to stop OCP usage to prevent further adenomas from occurring.

Supported by:

Primary Presenter / email: **Duvall, John / JTDU228@G.UKY.EDU**  
**Professional Student (MD, PharmD, Dentistry, PT)**  
**Case Report**  
**Surgery**

Presentation **185**

Abstract Title: **When the Judge Makes the Diagnosis: A Case of Panhypopituitarism due to Empty Sella in a Police Officer**

Author(s): Yazan Alrefai, MS3, University of Kentucky College of Medicine

**Abstract:** Background: Empty sella syndrome, often an incidental radiological finding, may lead to hypothalamic-pituitary dysfunction, particularly when secondary to trauma. This case highlights the delayed diagnosis of trauma-induced panhypopituitarism and its legal implications.

Case Presentation: A 34-year-old police officer suffered multiple head injuries in 2007 during an on-duty assault. He later developed persistent symptoms, including cognitive decline, depression, polyuria, erectile dysfunction, and chronic fatigue. Initial MRI scans (2008, 2011) were unremarkable. In 2015, at age 42, he was referred for low testosterone and diagnosed with hypogonadotropic hypogonadism. Further endocrine evaluation confirmed central diabetes insipidus and GH deficiency. A 2015 MRI revealed an empty sella turcica, leading to a diagnosis of trauma-induced hypopituitarism.

Treatment & Outcome: The patient was treated with testosterone replacement, desmopressin, and GH therapy, resulting in significant symptomatic improvement. His worker's compensation claim faced conflicting medical opinions regarding the causality of empty sella and hypopituitarism. Ultimately, a judge ruled in favor of a work-related diagnosis, granting benefits.

Conclusion: This case underscores the importance of long-term endocrine surveillance in patients with traumatic brain injury. It also highlights the medico-legal challenges in attributing hypopituitarism to prior trauma. Clinicians should consider endocrine dysfunction in patients with persistent post-traumatic symptoms, even years after injury.

Supported by:

Primary Presenter / email: **Alrefai, Yazan / yal237@uky.edu**  
**Professional Student (MD, PharmD, Dentistry, PT)**  
**Clinical Research**  
**Surgery**

Presentation 186

Abstract Title: **Outcomes of Aortic Valve Replacement for Infective Endocarditis: A Single-Center Experience**

Author(s): C. Ditka MS1 BS, U of Kentucky; Research Mentor: S.P. Saha MD, MBA, U of Kentucky

**Abstract:** Objectives: Infective endocarditis (IE) is a serious life-threatening disease with an associated high morbidity and mortality. Surgical intervention such as aortic valve replacement (AVR) is common practice to treat patients with IE. In this study, 50 patient cases of AVR intervention to treat IE conducted at the University of Kentucky were analyzed to evaluate the associated outcomes.

Methods and Materials: After gaining Institutional Review Board approval, 35 male (average age 47.2) and 15 female (average age 44.4) records were accessed to analyze patients who had AVR surgeries with bioprosthetic valves to treat IE at our institution. 48 were Caucasian and 2 were Black. The most common organism causing IE was Enterococcus faecalis. Out of the 50 patients, 31 admitted to IV drug abuse. 13 patients had a redo AVR and 18 patients had at least one additional surgery performed (mitral valve, tricuspid valve, or aortic root replacements).

Results: There were no deaths within 30 days of AVR surgery. The average length of stay after surgery was 21.6 days. 13 patients had a prior history of AVR surgery and had a redo AVR. 3 out of the 50 patients left against medical advice while the remainder were discharged in stable condition either to home or a rehab facility.

Conclusions: IE is a deadly disease that is highly associated with IV drug abuse. AVR surgery is an effective treatment of IE with no deaths in this case, but it is associated with post-operative complications.

Supported by:

Primary Presenter / email: **Ditka, Chloe** / [cmdi237@uky.edu](mailto:cmdi237@uky.edu)  
**Professional Student (MD, PharmD, Dentistry, PT)**  
**Clinical Research**  
**Surgery**

Presentation **187**

Abstract Title: **Transaxillary Impella 5.5 Implantation Without Fluoroscopy: A Novel Approach**

Author(s): C. Jackel, College of Medicine, U of Kentucky; J. Chung, Cardiothoracic Surgery Division, U of Kentucky; M. Kawabori, Cardiothoracic Surgery Division, U of Kentucky

**Abstract:** The Impella 5.5 is a percutaneous left ventricular assist device designed to provide temporary circulatory support in patients with cardiogenic shock. Since its FDA approval in 2019, its applications have expanded, with transaxillary and direct aortic insertions being the primary approaches. While fluoroscopic guidance is typically used, data on fluoroscopy-free implantation, particularly via the transaxillary approach, is limited. Given constraints on hybrid operating room availability and fluoroscopic equipment, we hypothesized that the fluoroscopy-free direct aortic implantation technique could be adapted for the transaxillary approach. From January 1, 2023, to June 30, 2024, patients undergoing Impella 5.5 implantation via a peripheral artery without fluoroscopy were included. Preoperative planning incorporated computed tomography, echocardiography, and medical history review. The surgical technique involved ultrasound-guided arterial selection, vascular graft anastomosis, and transesophageal echocardiography for wire navigation and device placement. Six patients successfully underwent transaxillary Impella 5.5 implantation without fluoroscopy. No strokes or vascular complications occurred, and all devices were optimally positioned with rapid hemodynamic stabilization. The median operative time was 169.5 minutes (range: 96-307 minutes), comparable to traditional fluoroscopy-guided techniques. No cases required conversion to fluoroscopy. Fluoroscopy-free transaxillary Impella 5.5 implantation is a feasible and safe alternative in resource-limited settings. With meticulous patient selection and echocardiographic guidance, this technique expands access to mechanical circulatory support while maintaining procedural efficacy and safety.

Supported by:

Primary Presenter / email: **Jackel, Chris** / [caja246@uky.edu](mailto:caja246@uky.edu)  
**Professional Student (MD, PharmD, Dentistry, PT)**  
**Clinical Research**  
**Surgery**

**Presentation 188**

**Surgical Treatment of Cardiac Tumors: A Single Center Experience**

Abstract Title:

Author(s):

N. Marker B.A., MS2, U of Kentucky, College of Medicine, Lexington, KY, USA; E. Ogburn M.D., U of Kentucky, College of Medicine, Department of Surgery, Division of Cardiothoracic Surgery. Lexington, KY, USA; S. Saha M.D., M.B.A., FACS, U of Kentucky, College of Medicine, Department of Surgery, Division of Cardiothoracic Surgery. Lexington, KY, USA

**Abstract:** Objective: This study is a retrospective review of diagnostic procedures, surgical management, and outcomes in patients treated for tumors of the heart in our institution. We compare our management approaches, clinical and surgical outcomes with those reported in the literature.

Methods & Materials: The study population includes patients 7-79 years old that presented to University of Kentucky Healthcare for tumors of the heart from July 2004 - January 2023. With IRB approval, subjects for this study were identified via CPT codes for tumors of the heart.

Results: There were 23 men and 29 women in the patient group. The average patient age was 54 years old. The most common diagnosis methods were echocardiogram, cardiac MRI, and CT scan. Operative treatment was offered to 52 people; 47 had resection and 5 had biopsy only. The most common postoperative complication was respiratory insufficiency (22) and sepsis (2). The most common diagnosed cell type for the cardiac tumors was myxoma (61.5%). 39 patients were discharged home in a stable condition. The study population had 1 operative mortality. 44 of the 52 patients treated are alive after 2 years.

Conclusion: Clinical outcomes such as discharge status, post-operative condition, and length of survival after procedures are similar to those from other referral centers for such conditions. Complete resection was possible in 90% of cases. 85% of patients in this study surgically treated for cardiac tumors are alive after 2 years. This study shows surgical removal offers the best chance of cure for cardiac tumors.

Supported by: NIH CTSA grant (UL1TR001998)

Primary Presenter / email:

**Marker, Nicole** / nbma225@uky.edu  
**Professional Student (MD, PharmD, Dentistry, PT)**  
**Clinical Research**  
**Surgery**

**Presentation 189**

Abstract Title: **Endovascular Treatment of Iatrogenic Acute Budd-Chiari Syndrome Secondary to Malpositioned Hemodialysis Catheter**

Author(s): R. K. Patel, College of Medicine, U of Kentucky; M. Ozen, Department of Radiology, Mayo Clinic, Phoenix, AZ

**Abstract:** Budd Chiari Syndrome (BCS) is a rare complication that arises from the blockage of the hepatic venous outflow in between the inferior vena cava and the smaller hepatic veins. BCS patients usually present with abrupt onset of ascites, painful hepatomegaly, unexplained chronic liver disease, and serum transferase levels five times the upper limit of normal. One etiology, although uncommon, of BCS is iatrogenic. We present the case of a 22-year-old patient initially coming in for drain placement confirmed to have Budd-Chiari Syndrome secondary to malpositioned hemodialysis catheter. Our patient, 22-year-old female, with past medical history of ESRD on HD w/LUE AV graft, and multiple fistulograms and balloon angioplasties comes in with severe abdominal pain after a hemodialysis catheter exchange. Computed Tomography of the abdomen (CTA) showed ascites, hepatic vein occlusion, and heterogenous liver enhancement suggesting Budd-Chiari Syndrome. In addition, patient liver enzymes were elevated: ALT 806 U/L, AST 431 U/L, INR 2.8. BCS can be categorized as primary (due to thrombosis) or secondary (due to external compression or invasion). Hypercoagulable states are present in most cases, but iatrogenic BCS, as demonstrated here, is rare. According to the European Association for the study of the liver (EASL), treatment for BCS is most commonly lifelong anticoagulant therapy to reduce clot extension and more thrombotic events. However, a high rate of bleeding complications (50%) has been reported in a cohort of BCS while on anticoagulation. Other treatments include an endovascular approach to relieve the hepatic venous obstruction and restore physiologic hepatic venous outflow. This case underscores the importance of careful catheter placement and highlights the role of endovascular interventions such as angioplasty, thrombolysis, and thrombectomy in managing hepatic venous outflow obstruction.

Supported by:

Primary Presenter / email: **Patel, Ronak / rkpa228@uky.edu**  
**Professional Student (MD, PharmD, Dentistry, PT)**  
**Scholarship of Teaching & Learning**  
**Surgery**



Presentation 190

Abstract Title: **Transcatheter closure of patent foramen ovale-a single center experience.**

Author(s): Reecha Suri, College of Medicine, University of Kentucky College of Medicine; Sib P. Saha, Division of Cardiothoracic Surgery, University of Kentucky College of Medicine

**Abstract:** Objective: A patent foramen ovale (PFO) is present in 20-30% of the adult population. It is found incidentally in most patients, but can have clinical manifestations such as stroke, seizures, and migraines. The aim of this study is to review the experience of PFO closure at our institution.  
Methods: This is a clinical research study that was IRB approved at our institution. We completed a retrospective chart review of 289 patients between the ages of 18-100 years old that presented between January 2012 and December 2022. There were 173 female patients and 116 male patients. The average age for the patients was 56.82. Our patient population identified as White (93.07%), Black (5.19%), and either Hispanic, Asian, or of mixed race (less than 2%).  
Results: There were 11 immediate post-operative complications which included tachycardia (5), hypotension (2), femoral vein bleed, rash due to an unknown reason, fatigue, and bradycardia.  
There were 18 deaths during the time we followed the patients. 8 deaths occurred within 30 days of surgery due to respiratory failure (3), pulmonary emboli (2), intracardiac thrombus, hypovolemic shock, and lung cancer. 2 deaths occurred within 90 days of surgery due to respiratory failure and heart failure. 5 deaths occurred within 2 years of surgery due to cardiogenic shock, respiratory failure, cerebral aneurysm, lung cancer, and an unknown reason. 3 deaths occurred between 3-8 years after surgery due to STEMI, renal failure, and liver cirrhosis. 233 patients were discharged within 0-1 day of surgery. 25 patients were discharged within 2-5 days. 10 patients were discharged after 6-15 days. 9 patients were discharged home after 16-51 days of surgery due to endocarditis (3), heart failure, cardiogenic shock, cerebral edema, septic emboli, thrombus, and arm swelling. 3 patients did not have a discharge date.  
Conclusion: The procedure-related complications were low, but a significant number of patients died of their associated diseases.

Supported by:

Primary Presenter / email: **Suri, Reecha** / reecha.suri@uky.edu  
**Professional Student (MD, PharmD, Dentistry, PT)**  
**Clinical Research**  
**Surgery**

**Presentation 191**

Abstract Title: **Interdisciplinary Communication Tools in a Division of Surgery**

Author(s): R. M. Zalla, College of Medicine, U of Kentucky; E. B. Williams, Department of Surgery, U of Kentucky; D. S. Walsh, Department of Pediatric Surgery, U of Kentucky

**Abstract:** Purpose: To describe the tools used for communication by a division of pediatric surgery with focus on Microsoft Teams.

Introduction: Many forms of communication are utilized within the division of pediatric surgery including face-to-face interaction, phone calls, texting, pagers, Epic chat, and a Microsoft Teams channel. Each method is used for communication between team members or to communicate with outside disciplines and comes with strengths and weaknesses. A division of Pediatric Surgery created a Microsoft Teams channel to facilitate better communication and interdisciplinary collaboration between members of the patient care team. Members can chat with each other through instant messaging, audio calls, or video conferencing. The channel is used daily for updates on patients on the service, requests for follow up appointments, adjustments in the OR schedule, and more. Additionally, files are regularly uploaded to the channel providing access to clinical education materials, practice guidelines, and administrative documents.

Methods: Microsoft analytics were used to determine engagement with the Teams channel over a period of 90 days.

Results: Over a period of 90 days from 8/9/24-11/7/24, the Teams channel had 62 active users and 1 active guest out of 101 members. 700 total posts were made with 698 replies, 711 reactions, and 400 mentions.

Conclusion: Microsoft Teams is a unique and efficient tool for communication, distribution of clinical education and practice materials, and improved ease of administrative tasks in a division of surgery.

Supported by:

Primary Presenter / email: **Zalla, Rachel / rmza222@uky.edu**  
**Professional Student (MD, PharmD, Dentistry, PT)**  
**Quality Improvement**  
**Surgery**

Presentation **192**

Abstract Title: **Case Study: Identifying low-level DSAs in a pre-transplant kidney/pancreas patient.**

Author(s): Y. Liu, Department of Pathology and Clinic Laboratory, U of Kentucky;  
R. Wharton, Department of Pathology and Clinic Laboratory, U of Kentucky, Lexington, KY

**Abstract:** Identifying donor-specific antibodies (DSAs) in kidney/pancreas pre-transplant patients is critical for predicting and preventing antibody-mediated rejection (ABMR). In this case study, we examined a male kidney/pancreas patient with end-stage renal disease caused by hypertension. The pre-transplant assessment, initial and final flow crossmatches (FCXM) with the potential donor, revealed T cells with a borderline FCXM, and B cells with a negative FCXM. The potential donor expressed homozygous B44. The class I single antigen beads (SAB) assay indicated the presence of a weak pre-transplant DSA, anti-B44, with a mean fluorescence intensity (MFI) ranging from 566 to 1134 across all the serum samples. The surrogate FCXM studies showed weak reactivity with donors expressing heterozygous B44 and no reactivity with donors lacking B44. This suggested that anti-B44 was a risk for the patient to be transplanted with the potential donor, considering all the FCXM results. These findings highlight the importance of monitoring low-level pre-DSAs and providing individualized patient care in pre-transplant assessments.

Supported by:

Primary Presenter / email: **Liu, Yinxing** / yinxing.liu@uky.edu  
**Staff**  
**Clinical Research**  
**Transplant**

**Presentation 193**

Abstract Title: **Geographic Disparities in Naso-Orbital-Ethmoid Fractures: Injury Patterns, Care Delivery, and Clinical Outcomes**

Author(s): C. Bobo, U of Kentucky College of Medicine; E. Smith, U of Kentucky College of Medicine; L. Elliott, U of Kentucky College of Medicine; K. Karnik, Department of Biostatistics, U of Kentucky; T. Mangino, Department of Biostatistics, U of Kentucky; P. Leader, Department of Otolaryngology, U of Kentucky; M. Bush, Department of Otolaryngology, U of Kentucky, Lexington, KY

**Abstract:** Objectives: Naso-orbital-ethmoid (NOE) fractures can lead to significant complications, such as vision problems, cosmetic deformities, and anosmia, and timely identification and carefully coordinated care is necessary to prevent these complications. Patients from rural locations face challenges accessing and utilizing care; however, the impact of residence location has not been studied in NOE patients. The objective of this study is to compare and contrast the clinical presentation, care delivery, and clinical outcomes in patients with NOE fractures based on geographic residence.

Methods: Patients were identified who had NOE fractures surgically repaired between 2010-2022 at a level 1 trauma center. Dependent variables for statistical analysis included injury-specific mechanism of injury (MOI), time to repair, and receipt of post-operative imaging. Independent variables included medical factors (multisystem trauma, ICU stay) and sociodemographic data (including rural versus urban residence).

Results: 139 patients were included in the analysis. The median time to NOE repair in urban patients was four days (range 0-144 days), while rural patients was five days (0-678 days). Beale Code groups 1-4 are 2.78 times more likely (95% CI; 1.19, 6.67) to receive post-operative imaging than those in groups 5-9. Females were 4 times more likely (95% CI; 1.45, 11.11) to have a mandible fracture, whereas males were 2.65 times more likely to have frontal sinus fractures (95%CI; 1.09, 6.82).

Conclusions: Patients who sustain complex trauma from rural areas may face delays in surgical care and post-operative management and, therefore, deserve further investigation on factors that influence care delivery and methods to improve.

Supported by: PSMRF: The project described was supported by the National Center for Advancing Translational Sciences, through Grant UL1TR001998. The content is solely the responsibility of the authors and does not necessarily represent the official views of the NIH.

Primary Presenter / email: **Bobo, Clayton** / cwbo229@uky.edu  
**Professional Student (MD, PharmD, Dentistry, PT)**  
**Clinical Research**  
**Trauma**

**Presentation 194**

Abstract Title: **Development of a Primary Care Scholarly Concentration: Creating a Primary Care Health Inequities and Delivery Course**

Author(s): S.A. Haist, Department of Internal Medicine and the Office of Medical Education, U of Kentucky; C.L. Elam, Department of Behavioral Science, U of Kentucky; A.R. Hoellein, Department of Internal Medicine, U of Kentucky

**Abstract:** Physician supply lags patient demand in Kentucky where it is expected that an additional 640 primary care physicians (PCPs) must be added to the Commonwealth's workforce by 2030. Funding from HRSA enabled the University of Kentucky College of Medicine to launch a multifaceted approach to address our primary care shortage through 1) tailored outreach and exposure programs for secondary school students, 2) pre-matriculation programming for accepted medical students, and 3) a Primary Care Scholarly Concentration for selected UKCOM students.

Health care access and health inequities limit opportunities for optimal health. Through active learning experiences, the Primary Care Health Inequities and Delivery course explores the social determinants of health (SDOH) and how systemic factors impact access. This second-year elective, first offered in Fall 2024, meets two hours each week. Approaches to instruction are varied including presentations by medical specialists, shadowing in a free clinic, workshop training addressing physician bias and cultural humility, standardized patient training emphasizing SDOHs, a trip to a regional community hospital producing rural PCPs, and a panel of legislative and policy leaders discussing advocacy and access. Student learning is facilitated through readings, reflective essays and student presentations.

Students completed pre-course Qualtrics surveys regarding expectations and attitudes toward inequities, and health policy, and ACEs. They journaled general impressions of the utility and interest generated by class activities. Preliminary evaluation data suggests that students completing the elective thought course content reinforced the importance of PCPs in facilitating early and comprehensive care. End of course evaluations will be summarized for the conference.

A variety of speakers, a range of instructional methods, and group interactions engaged students in considering strategies to address health access and outcomes.

Supported by: HRSA grant: Value Based Medical Student Education Training Program (T99HP52106).

Primary Presenter / email: **Haist, Steven** / Steven.Haist@uky.edu  
**Faculty**  
**Scholarship of Teaching & Learning**  
**Education**

Presentation 195

Abstract Title: **Interrater Reliability for Use of "Opportunistic" CT as a Bone Health Assessment in Chronic Pancreatitis (CP) Patients**

Author(s): R. L. Hill, U of KY; A. K. Dasyam, UPMC; A. Dunn, OSU; M. Snyder, UPMC; Y. Yang, MD Anderson/U of TX; L. Li, MD Anderson/U of TX; P. A. Hart, OSU; S. S. Vege, Mayo Clinic; E.L. Fogel, IU; J. Serrano, NIDDK, NIH; D. Andersen, NIDDK, NIH; S. J. Pandol, Cedars-Sinai; C. E. Forsmark; U of FL; W. E. Fisher, Baylor; W. F. Park, Stanford University; D. Yadav, UPMC; S. V. D. Eeden, Kaiser Permanente; D. L. Conwell, U of KY; Z. K. Shah, OSU; On behalf of the CPDPC

**Abstract:** Introduction: Osteopathy (osteopenia or osteoporosis) is a common problem that occurs in patients with chronic pancreatitis; however, screening is underutilized in this patient population. Assessing changes in bone mineral density (BMD) on CT imaging may provide an opportunity to improve screening rates; however, the variability of measurement between different observers has not been evaluated.

Methods: A total of 57 participants enrolled into the PROCEED study with a prior DXA scan were randomly selected for this analysis. Of these, 12 were excluded due to one of the following reasons: there was no CT image, the CT was unreadable by one or both radiologists, or no value was entered by one or both radiologists. The remaining 45 participants with available CT scan data were used for this analysis. The CT images obtained from these participants were evaluated independently by two blinded radiologists at two different consortium sites. We compared the CT derived BMD in Hounsfield units (HU) obtained from lumbar spine (L1 vertebrae) as obtained by one radiologist with the HU obtained by the other radiologist. An intraclass correlation (ICC) was used to evaluate the interobserver variability across the different categories of normal, osteopenia, and osteoporosis based on T scores from DXA scans.

Results: Overall, for the 45 participant CT scans analyzed, there was very high interobserver agreement for the measurement of bone mineral density using HU reported by the radiologists (ICC = 0.94;  $p < 0.001$ ). Dividing the cohort into its respective subgroups (as defined by the DXA): the normal group ( $n = 14$ ) had an ICC of 0.9, the osteopenia group ( $n = 14$ ) had an ICC of 0.94, and the osteoporosis group ( $n = 17$ ) had an ICC of 0.96; all of which were significant ( $p < 0.001$ ).

Conclusion: There is a very high degree of concordance among radiologists for assignment of bone health using evaluation of HU at the L1 vertebrae from opportunistic CT.

Supported by: Research Supported by the NCI and NIDDK (U01 DK108327; U01 DK127388)

Primary Presenter / email: **Hill, Rachel** / rachel.hill@uky.edu  
**Faculty**  
**Clinical Research**  
**GI**

Presentation 196

Abstract Title: **Evaluation of Pancreatic Fluid Enzyme Activity in the PROCEED Study**

Author(s): R. L. Hill, UKY; B. Abomoelak, Orlando Health; J. L. Saloman, UPMC; K. J. McQuerry, UKY; P. A. Hart, OSU; Z. Cruz-Monserrate, OSU; H. Steen, Boston Children's; W. E. Fisher, Baylor; E. L. Fogel, IU; C. E. Forsmark; U of FL; L. Li, MD Anderson/U of TX; S. J. Pandol, Cedars-Sinai; J. Serrano, NIDDK, NIH; D. Andersen NIDDK, NIH; W. E. Fisher, Baylor; W. F. Park, Stanford Univ.; S. S. Vege, Mayo Clinic; S. V. D. Eeden, Kaiser Perm. CA; D. Yadav, UPMC; D. I. Mehta, Orlando Health; D. L. Conwell, UKY; On behalf of the CPDPC

**Abstract:** Clinical use of ePFT is useful, yet cumbersome, therefore, not widely used diagnostically for CP patients. In a pilot study, the assessment of a shorter ePFT collection of pancreatic fluid (PF) showed significant differences in multiple pancreatic enzymes. In this study, we assessed the diagnostic performance of samples collected during an abbreviated ePFT to differentiate pancreatitis stages. We analyzed PF samples from PROCEED patients (n = 85): near-normal, recurrent acute pancreatitis (RAP), definitive CP. PF samples were collected at two 10-minute intervals immediately following secretin administration. Pancreatic enzymes and electrolytes were blindly analyzed in a central laboratory. Levels were normalized by log transformation of per sample protein. Statistical analysis included ANOVA w/ FDR method for multipled testing, followed by Tukey-adjusted pairwise comparisons.

As anticipated, chloride and bicarbonate are reciprocally related as disease progresses [nadir Cl: near-normal < RAP < CP; peak HCO<sub>3</sub>: near-normal > RAP > CP]. At 0 – 10 minutes, chloride concentration in the CP group was significantly higher vs RAP and near-normal groups. For bicarbonate, the concentration in the CP group was significantly lower vs RAP group for both interval samples. Expectedly, enzyme activity decreases as disease progresses [near-normal > RAP > CP]. At 0 – 10 minutes, amylase, lipase, and elastase activity in the CP group was significantly lower vs RAP group; trypsin activity in the CP group was significantly lower vs RAP and near-normal groups. At 10 – 20 minutes, lipase and trypsin activity in the CP group was significantly lower vs RAP group. Analysis of pancreatic fluid obtained from this abbreviated ePFT can differentiate patients across the pancreatitis continuum. Notably, trypsin enzyme activity may be considered a biomarker to follow disease progression. Continued investigation and validation are warranted to determine the performance in other real-world scenarios.

Supported by: Research Supported by the NCI and NIDDK (U01 DK108327; U01 DK127388)

Primary Presenter / email: **Hill, Rachel** / rachel.hill@uky.edu  
**Faculty**  
**Clinical Research**  
**GI**

Presentation 197

Abstract Title: **Serum Bone Biomarkers in Chronic Pancreatitis (CP): An Exploratory Pilot Study From the NAPS2 Cohort**

Author(s): R. L. Hill, Dept of Internal Medicine, U of KY; D. Yadav, Dept of Medicine, UPMC; P. A. Hart, Dept of Internal Medicine, OSU; D. C. Whitcomb, Dept of Medicine, UPMC; K. J. McQuerry, Dept of Biostatistics, U of K; K. Karnik, Dept of Biostatistics, U of K; K. M. Stello, Dept of Medicine, UPMC; M. Rao, Dept of Internal Medicine, U of K; D. L. Conwell, Dept of Internal Medicine, U of K; On behalf of the NAPS2 Consortium

**Abstract:** Multiple factors including systemic inflammation, nutrient malabsorption, BMI, & gender differences predispose patients with CP to an imbalance in osteoblast and osteoclast function, increasing risk for osteopathy & fragility fractures. Previous studies have linked increased bone turnover and inflammation with osteopathy in CP patients. We evaluated serum samples for biomarkers of bone remodeling.

Serum collected from participants in the NAPS2 Study (CP, n = 40; controls, n=40) were analyzed with a Bone Biomarker multiplex assay according to the manufacturer's protocol using a Luminex® 200. Levels were log-transformed prior to analyses. Statistical analysis included ANOVA with FDR method applied for multipled testing, followed by Tukey-adjusted pairwise comparisons. The effectiveness of each biomarker was evaluated using the ROC curve and the area under the ROC curve (AUC).

Six bone markers were found to be significantly different comparing the CP subjects to controls. DKK1 & sclerostin ( $p < 0.001$ ), markers inhibiting bone formation, and RANKL ( $p < 0.001$ ), a marker of bone resorption, are elevated in CP patients, while insulin ( $p = 0.0031$ ), a marker indicative of bone formation, is decreased in CP patients. Two markers known as bone turnover regulators, oncostatin ( $p = 0.0019$ ) & osteopontin ( $p < 0.0001$ ) were also elevated in the serum from CP patients compared to controls.

We report significant changes in bone biomarkers in CP patients compared to controls. These bone markers are involved in published mechanistic pathways. The pattern of turnover described above negatively impacts bone metabolism, predisposing CP patients to osteopathy.

Supported by: This research was partly supported by the NIDDK T32 DK063922 (DCW), NIH DK061451 (DCW), R21 DK098560 (DCW)

Primary Presenter / email: **Hill, Rachel** / rachel.hill@uky.edu  
**Faculty**  
**Clinical Research**  
**GI**



Presentation **198**

Abstract Title: **PAQR4 impacts liver metabolic remodeling by mediating ceramide levels and hepatokine signaling**

Author(s): QZ Zhu, Barnstable Brown Diabetes and Obesity Center, U of Kentucky; SZ Zhao, Sam and Ann Barshop Institute for Longevity and Aging Studies, Department of Medicine and Department of Cellular & Integrative Physiology, UT Health Science Center at San Antonio, TX; JB Funcke, Touchstone Diabetes Center, UT Southwestern Medical Center, Dallas, TX; P.E. Scherer, Touchstone Diabetes Center, UT Southwestern Medical Center, Dallas, TX

**Abstract:** PAQR4, a member of the progestin and adipoQ receptor family (PAQR1-11), is implicated in various cancers, including breast cancer and hepatocellular carcinoma (HCC), yet its metabolic role remains unclear. We recently identified PAQR4 as a key regulator in ceramide metabolism by mediating ceramide synthases (CERS). Here, we reveal its critical role in liver metabolism. Liver PAQR4 is upregulated upon injuries including steatosis, hepatitis, and hepatocellular carcinoma (HCC), and correlates with CERS in HCC-livers. To investigate its liver function, we generated doxycycline (dox)-inducible hepatocyte-specific transgenic (Paqr4-Tg) and knockout (Paqr4-LKO) mice. Paqr4 induction in hepatocytes caused transient weight loss due to reduced food intake, accompanied by hypoglycemia, lower hepatic glycogen, and downregulated gluconeogenic genes (Pck1 and G6pc), indicating impaired hepatic glucose production. Metabolic cage studies revealed a shift toward fat oxidation with lower respiratory exchange ratios. Moreover, Paqr4-Tg mice displayed elevated NEFA levels and enhanced adipose lipolysis. In obese conditions, Paqr4-Tg mice fed a high-fat diet (HFD) exhibited similar weight reduction and hypoglycemia upon dox- induction. In contrast, Paqr4-LKO mice displayed minor effects on systemic metabolic effects despite significant alterations in hepatic carbohydrate and lipid pathways. Consistently, PAQR4 overactivation in hepatocytes caused ceramide accumulation and impaired liver mitochondrial function. Moreover, PAQR4 overactivation increased the circulating levels of hepatokine FGF21 and bile acids, which may mediate liver-adipose crosstalk and enhance adipose lipolysis. These findings establish PAQR4 as a key regulator of liver metabolism by regulating ceramide levels and hepatokine signaling. Further studies are needed to elucidate its role in metabolic-associated steatohepatitis (MASH) and HCC progression.

Supported by: AHA855170; UK College of Medicine Startup funds

Primary Presenter / email: **Zhu, Qingzhang** / qzh251@uky.edu  
**Faculty**  
**Basic Research**  
**Other**

Presentation 199

Abstract Title: **Multi-Omic and Biochemical Profiling of Heart Failure Specimens at the University of Kentucky**

Author(s): A. T. Minton, Departments of Physiology and Internal Medicine, U of Kentucky; A. G. Wellette-Hunsucker, Departments of Physiology and Internal Medicine, U of Kentucky; K. S. Campbell, Departments of Physiology and Internal Medicine, U of Kentucky

**Abstract:** In collaboration with UKHealthCare clinical teams, the Campbell Lab has created a cardiac biobank containing more than 20,000 specimens from 650 human hearts. Procurements include myocardium from cardiovascular procedures (e.g., transplantation) and organ donation. Nucleic acids were extracted from 350 specimens and sent for whole exome and transcriptome sequencing. The average patient age was 52 years, and dilated cardiomyopathy (DCM) was the most frequent clinical presentation (35%). In failing and donor hearts, 340,944 deleterious genomic variants and 6,485 differentially expressed genes were identified. Deleterious variants in the genes encoding titin (TTN), myosin-binding protein C (MYBPC3), and alpha myosin (MYH6) are found in both groups. Moreover, there is significant overexpression of TTN ( $p < 0.01$ ) and MYH6 ( $p < 0.001$ ) transcripts, unlike MYBPC3 ( $p = 0.85$ ). In DCM patients with pathogenic TTN variants, relative protein phosphorylation (troponin I [TnI] and myosin-binding protein C [MyBP-C]) and content (collagen and alpha tubulin) were quantified using various biochemical assays. Previous data from our lab displayed hypophosphorylation of TnI and MyBP-C in DCM; however, this study shows that those with pathogenic TTN variants deviate from this trend. Tubulin content trended downward ( $p = 0.12$ ), but collagen content remained comparable to donors ( $p = 0.90$ ). Further analysis of this data will provide a genetic atlas representing heart failure patients in the greater Bluegrass region. Additional omic and bioanalytical studies are underway to explore the contribution of TTN variants to DCM pathology. Our team is happy to share deidentified samples and clinical data with researchers to help develop better therapies for heart failure patients.

Supported by: NIH awards: R01HL173989, R01HL146676, R01HL149164, and R01HL163977

Primary Presenter / email: **Minton, Austin** / [atmi229@uky.edu](mailto:atmi229@uky.edu)  
**Graduate Student**  
**Translational Research/Science**  
**Cardiovascular**

**Presentation 200**

**Abstract Title: Genome-Wide Analysis of Short Tandem Repeat Expansions in Alzheimer's Disease**

**Author(s):** Bikram Karki, Department of Computer Science and Division of Biomedical Informatics, Department of Internal Medicine, University of Kentucky; Yuriko Katsumata, Department of Biostatistics, College of Public Health, University of Kentucky; David W. Fardo, Department of Biostatistics, College of Public Health, University of Kentucky; Cody J Steely, Division of Biomedical Informatics, Department of Internal Medicine, University of Kentucky

**Abstract:** Background: Alzheimer's Disease (AD), the leading cause of dementia in older adults, has established genetic risk factors including mutations in APP, PSEN1, PSEN2, and APOE. While Short Tandem Repeats (STRs) are highly mutable sequences that are implicated in various neurodegenerative disorders, their potential role in AD pathogenesis remains understudied.

Methods: We analyzed a subset of whole-genome sequencing data from the Alzheimer's Disease Sequencing Project (ADSP) cohort, comprising 10,546 individuals (5,022 AD cases, 5,524 controls). Using GangSTR for genome-wide STR genotyping and DumpSTR for quality control, we implemented filters for call rate, Hardy-Weinberg equilibrium, and read support. Case-control association analysis was performed using PLINK2 with logistic regression. We developed a custom Python pipeline to identify expansion thresholds using Fisher's exact test and employed Random Forest classification.

Results: Our analysis identified significant STR expansions in dinucleotide, trinucleotide, and tetranucleotide sequences mapped to nearby neurologically relevant genes, including CNTN5, ANKS1B, ATP8A2, SOBP, SPTBN4, SLC8A2, GRIN2D, MSL2, and CNRIP1. These genes are linked to neurodevelopmental disorders, with ANKS1B associated with cognitive impairment and schizophrenia, and CNTN5 implicated in Autism Spectrum Disorder, Attention Deficit Hyperactivity Disorder, and AD.

Conclusion: Our findings demonstrate compelling evidence for the role of STR expansions in neurologically relevant genes in AD pathogenesis. To validate these results, we plan to employ Support Vector Machine (SVM) classification alongside additional statistical and machine learning approaches. We will incorporate additional genomes from the ADSP cohort, with the potential to identify novel and causal genetic variants.

Supported by: ADRC grant P30 AG072946 to the University of Kentucky Alzheimer's Disease Research Center; NIH/NIA: 1RF1AG082339

Primary Presenter / email: **Karki, Bikram** / bikram.karki@uky.edu  
**Graduate Student**  
**Translational Research/Science**  
**Informatics**

**Presentation 201**

Abstract Title: **Impacts of Post-Translational Modifications of Sarcomeric Proteins in Various Heart Failure Etiologies**

Author(s): A. G. Wellette-Hunsucker, Department of Physiology and Division of Cardiovascular Medicine, U of Kentucky; G. N. Milburn, Division of Cardiovascular Medicine, U of Kentucky; U. Gulbulak, N. N. Eqa, Division of Cardiovascular Medicine, U of K; A. C. Gauthier, Division of Cardiovascular Medicine, U of Kentucky; F. Mumbi, Division of Cardiovascular Medicine, U of Kentucky; K. S. Campbell, Department of Physiology and Division of Cardiovascular Medicine, U of Kentucky;

**Abstract:** Regulatory protein phosphorylation in the sarcomere plays crucial roles in muscle contraction and relaxation by controlling actomyosin interactions and modulating cross-bridge kinetics. This study investigated the phosphorylation levels of myosin-binding protein C, regulatory light chain, and troponin I in approximately 200 organ donors and HF patients, encompassing various clinical subtypes of heart failure. The number of patients in each clinical subgroup was as follows: organ donors (32), dilated cardiomyopathy (31), ischemic heart failure (57), cardiac amyloidosis (5), titin mutations (14), postpartum cardiomyopathy (7), cardiac sarcoidosis (5), end-stage heart failure pre-Ventricular Assist Device (VAD) (30), and post-VAD (30). Phosphorylation levels of myosin binding protein-C were determined using SDS-PAGE/Western blotting. Data were analyzed using linear mixed models with clinical diagnosis as the main factor. One of the statistically significant findings was that relative phosphorylation of myosin binding protein-C at Ser273 and Ser282 was decreased in patients with dilated cardiomyopathy, cardiac amyloidosis, postpartum cardiomyopathy, cardiac sarcoidosis, and pre-VAD compared to organ donors. Interestingly, these differences were not observed for Ser302 phosphorylation. Troponin I phosphorylation was decreased across all clinical subtypes of heart failure relative to organ donors, except in patients with titin mutations. Lastly, phosphorylation of the regulatory light chain showed little change in patients with heart failure compared to organ donors. These findings suggest that heart failure leads to decreased phosphorylation of Protein Kinase A targets, while other targets appear less affected. Alterations in phosphorylation may contribute to the depression in myocardial performance observed in patients with heart failure.

Supported by: NIH award: F31HL17055802

Primary Presenter / email: **Wellette-Hunsucker, Austin** / a.wellette@uky.edu  
**Graduate Student**  
**Translational Research/Science**  
**Cardiovascular**

**Presentation 202**

Abstract Title: **Mechanical Unloading Increases Phosphorylation of Sarcomeric Proteins and N2B Titin in Patients with Heart Failure**

Author(s): G.N. Milburn, Departments of Internal Medicine and Physiology, U of Kentucky; A.G. Wellette-Hunsucker, Departments of Internal Medicine and Physiology, U of Kentucky; F. Mumbi, Department of Internal Medicine, U of Kentucky; A. Yackzan, Department of Internal Medicine, U of Kentucky; U. Gulbulak, Department of Internal Medicine, U of Kentucky; T. Kampourakis, Department of Internal Medicine, U of Kentucky; K.S. Campbell Departments of Internal Medicine and Physiology

**Abstract:** Left ventricular assist devices (LVAD) can be used in patients with advanced heart failure. These pumps mechanically unload the left ventricle to maintain adequate cardiac output independent of cardiac function. To examine how mechanical unloading impacts the myocardium, we have collected 35 paired left ventricular samples from patients before and after LVAD support. We measured regulators of passive tension and phosphorylation of myosin binding protein-C (MyBPC) and troponin I (TnI). An improved understanding of how the myocardium responds to hemodynamic unloading may assist in tailoring the management of these patients and the development of new devices.

Mechanical unloading significantly increased the percentage of N2B titin. While titin isoforms were impacted by unloading, there were no changes in tubulin abundance or collagen deposition. This suggests that while intracellular stiffness may change with unloading, there is no significant impact on fibrosis or cytoskeletal proteins. MyBPC phosphorylation at PKA-mediated sites Ser273 and Ser282 was significantly increased after LVAD support. TnI phosphorylation, also a target of PKA, was significantly increased after unloading. Phosphorylation of MyBPC at Ser302 is primarily mediated by PKD and was not changed after LVAD support. Interestingly, the change in phosphorylation of TnI and MyBPC was dependent on the BMI of the patient at the time of initiation of LVAD support. These data suggest that mechanical support increases the phosphorylation of sarcomeric proteins targeted by PKA, but that BMI may diminish this effect.

Additional investigation is needed to understand the interaction between the effects of LVAD support on sarcomere phosphorylation and BMI. Taken together, these changes may contribute to improvements in adrenergic reserve and contractile function in these patients and may help to tailor pharmaceutical therapies such  $\beta$ -blockers and milrinone in mechanically unloaded patients.

Supported by: This study was supported by the National Institutes of Health (HL149164 to KSC and 1F31HL170558 to AWH) and the American Heart Association (24PRE1191551 to GNM).

Primary Presenter / email: **Milburn, Gregory** / gnmi223@uky.edu  
**Graduate Student**  
**Translational Research/Science**  
**Cardiovascular**

**Presentation 203**

Abstract Title: **Phosphorylation of Cardiac Myosin Binding Protein-C Does Not Predict Right Ventricle Heart Failure in HFrEF Patients**

Author(s): C. I. Roth, Departments of Physiology and Internal Medicine, U of Kentucky; G. N. Milburn, Departments of Physiology and Internal Medicine, U of Kentucky; K. S. Campbell, Departments of Physiology and Internal Medicine, U of Kentucky

**Abstract:** Cardiac myosin binding protein C (cMyBPC) is an essential regulator of cardiac myofilament contraction through its interaction with myosin and the thin filament. Phosphorylation of cMyBPC has been shown to modify these interactions and tune cardiac contraction and relaxation. Although cMyBPC and its posttranslational modifications in heart failure (HF) have been extensively studied in the left ventricle (LV), its impact on the right ventricle (RV) remains obscure. Phospho-specific antibodies for cMyBPC were used to identify whether cMyBPC phosphorylation is altered in the RV of HF patients and what role it may play in right ventricular dysfunction (RVD). We found that phosphorylation at Ser273 was significantly reduced in both HF ( $p = 0.005$ ) and HF with RVD ( $p = 0.001$ ), while Ser282 phosphorylation was decreased in HF with RVD ( $p = 0.032$ ). No significant difference was observed in Ser302 phosphorylation, which is consistent with what is seen in the LV of failing myocardium. Phosphorylation of cMyBPC did not correlate with in vivo assessment of RV function such as pulmonary artery pulsatility index (PAPI) or right atria:pulmonary capillary wedge pressure (PCWP). The hypo-phosphorylation of cMyBPC in HF patients with and without RVD suggests that phosphorylation status of cMyBPC may not be the primary determinant of right ventricular dysfunction in heart failure.

Supported by: This study was supported by the National Institutes of Health (HL149164 to KSC)

Primary Presenter / email: **Roth, Chloe** / rothchlo@uky.edu  
**Graduate Student**  
**Translational Research/Science**  
**Cardiovascular**

**Presentation 204**

Abstract Title: **Effects of Amitriptyline on the Glucoregulatory Response in a Rodent Model of Hypoglycemia-Associated Autonomic Failure**

Author(s): Z. A. Beckner, Department of Internal Medicine (IM) - Endocrinology, U of Kentucky; A. M. Thompson, IM - Endocrinology, U of Kentucky; M. H. Devore, IM - Endocrinology, U of Kentucky; A. M. Marksburly, IM - Endocrinology, U of Kentucky; L. A. Schoeder, IM - Endocrinology, U of Kentucky; E. Brockman, IM - Endocrinology, U of Kentucky; M. M. Wooten, IM - Endocrinology, U of Kentucky; S. J. Fisher, IM - Endocrinology, U of Kentucky

**Abstract:** Iatrogenic hypoglycemia blunts the counterregulatory response to future hypoglycemia challenges. This study aimed to determine whether the tricyclic antidepressant amitriptyline, previously shown to enhance hypoglycemia awareness, can prevent or restore the glucoregulatory response to hypoglycemia.

Protocol #1 – Prevention: Pre-cannulated Sprague-Dawley rats were conditioned with recurrent saline (RS) or recurrent insulin-induced hypoglycemia (RH). A cohort of RH rats were pretreated with amitriptyline (AMT) 10 mg/kg IP.

Protocol #2 – Restoration: Rats were subjected to 6 days of RS or RH. During the final 3 days of RH, rats were treated with either AMT or Saline.

Glucose infusion rate (GIR) was measured during a hyperinsulinemic (50 mU/kg/min)-hypoglycemic (~45 mg/dl) clamp.

In both protocols, consistent with blunted counterregulation, RH resulted in increased GIR. In the prevention protocol, but not the restoration protocol, RH+AMT had a significantly decreased GIR compared to the RH controls ( $p < 0.0001$ ).

In the prevention protocol, improved endogenous counterregulation indicates altered serotonin and norepinephrine signaling plays a role in the development of Hypoglycemia-associated autonomic failure (HAAF), but amitriptyline may not restore responses to established HAAF.

Supported by: NIDDK R01DK118082 and 1R25DK108894 to S.J.F

Primary Presenter / email: **Beckner, Zach** / zabe225@uky.edu  
**Graduate Student**  
**Translational Research/Science**  
**Other**

**Presentation 205**

Abstract Title: **Edaravone Protects the Hippocampus from Brain Damage Following Insulin-Induced Severe Hypoglycemia**

Author(s): A. Thompson, PNS, UK; N. Phelps, IM-Endocrinology, UK; H. Riley, IM-Endocrinology, UK; M. Wooten, IM-Endocrinology, UK; A. Marksby, IM-Endocrinology, UK; E. Brockman, IM-Endocrinology, UK; L. Schoeder, IM-Endocrinology, UK; Z. Beckner, PNS, UK; M. Devore, PNS, UK; I. Papazoglou PhD, IM-Endocrinology, UK; S.J. Fisher MD PhD, IM-Endocrinology and PNS, UK; University of Kentucky (UK); Departments of Internal Medicine (IM)-Endocrinology, Pharmacology and Nutritional Sciences (PNS)

**Abstract:** Introduction and Objective: To determine if Edaravone, a free radical scavenger and neuroprotective agent with antioxidant properties, could prevent brain damage following insulin-induced severe hypoglycemia in a rodent model.

Methods: 10-week-old Sprague-Dawley rats were divided into three treatment cohorts: 1) euglycemic controls, 2) rats treated with insulin-induced (15U mg/kg) severe hypoglycemia (SH: 10-15mg/dL for 90 minutes), and 3) rats similarly treated with SH followed by once daily treatment with Edaravone (3mg/kg) (SH+EDV). After one week animals were euthanized, perfused and brains extracted. Sections from the hippocampus (40µm) were stained for 1) cell death with Fluoro-Jade C (FJC) and Cleaved Caspase 3 (CC3), 2) neuronal inflammation with Iba-1/CD68, and 3) oxidative stress with 4-Hydroxynonenal (4HNE). Stains were analyzed using ImageJ and one-way ANOVA.

Results: As compared to euglycemic controls, severe hypoglycemia increased Iba-1/CD68 (10-fold), CC3 (30-fold), FJC (15-fold) and 4HNE (11-fold) ( $p < 0.01$  vs controls). As compared to SH alone, SH+EDV reduced all stained cells to a level not different from controls ( $p = NS$  vs controls).

Conclusion: Edaravone protected the brain from severe hypoglycemia induced cell death indicated by FJC and CC3 immunohistochemistry staining. Edaravone also reduced neuronal inflammation indicated by reduced Iba-1/CD68 staining, and reduced oxidative stress as indicated by 4HNE staining. Based on this data, post-hypoglycemia treatment with Edaravone could be a potential therapeutic intervention for those who experience severe hypoglycemia.

Supported by: NIDDK award: R01DK118082

Primary Presenter / email: **Thompson, Andrea** / amwo262@uky.edu  
**Graduate Student**  
**Translational Research/Science**  
**Other**



Presentation 206

Abstract Title: **Metoclopramide Restores Counterregulation in Hypoglycemia: Preclinical and Early Clinical Findings**

Author(s): M. H. Devore, Department of Pharmacology and Nutritional Sciences, University of Kentucky (UK); Lexington, KY; A. N. Iles, Department of Internal Medicine (IM) – Endocrinology; L. A. Schoeder, IM - Endocrinology, UK; M. B. Music, IM - Endocrinology, UK; B. V. Patel, IM - Endocrinology, UK; M. M. Wooten, IM - Endocrinology, UK; A. M. Thompson, IM – Endocrinology, UK; Z. A. Beckner, IM – Endocrinology, UK; E. L. Macon, IM – Endocrinology, UK; S. J. Fisher, IM – Endocrinology, UK

**Abstract:** People with insulin-treated diabetes face hypoglycemia risk due to imperfect insulin replacement and impaired counterregulation. We identified the dopamine antagonist, metoclopramide, as a potential treatment to improve the counterregulatory response.

In a pre-clinical model, diabetes was induced in 10-week-old Sprague-Dawley rats with streptozotocin (STZ, 65 mg/kg IP). Rats were randomized into: 1) diabetic controls (STZ+RS, n=5), 2) recurrent hypoglycemia (STZ+RH, n=6), and 3) recurrent hypoglycemia + metoclopramide (STZ+RH+MET, 3 mg/kg IP, n=7). After 3 days, all rats underwent a hyperinsulinemic (50 mU/kg/min) hypoglycemic (~45 mg/dl) clamp.

In a phase II, double-blinded, placebo-controlled trial, adults with Type 1 diabetes (age 20-60, ≥ 5 years duration) were randomized to placebo or metoclopramide and underwent hypoglycemic clamps (glucose lowered to 100, 65, 55, and 45 mg/dL) to assess awareness and counterregulatory responses.

In the pre-clinical studies, glucose infusion rates to maintain hypoglycemia were higher in STZ+RH (27±0.9 mg/kg/min) than STZ+RS (19±0.8 mg/kg/min, p<0.0001) and reduced with metoclopramide (STZ+RH+MET: 24±0.1 mg/kg/min, p<0.05 vs STZ+RH). Glucagon responses, preserved in STZ+RS (p<0.05 vs basal), were impaired in STZ+RH (p=NS) and restored with metoclopramide (p<0.05).

In the clinical trial, counterregulatory hormones increased during glucose clamps: epinephrine (21±3 to 301±60 pg/mL), growth hormone (1±0.6 to 14±3 ng/mL), and norepinephrine (231±38 to 359±58 pg/mL). Glucagon and cortisol remained stable. Hypoglycemia increased symptom scores from 2±0.7 to 19±4.

Although results from the clinical data remain blinded; the pre-clinical results indicate that metoclopramide improves glucoregulatory, sympathoadrenal, and counterregulatory responses to hypoglycemia, suggesting involvement of the dopaminergic system in mediating hypoglycemic counterregulation.

Supported by: UK TL1 grant TL1TR001997 to M.H.D and NIDDK R01DK118082 and 1R25DK109894 to S.J.F

Primary Presenter / email: **Devore, Micah** / micah.devore@uky.edu  
**Graduate Student**  
**Translational Research/Science**  
**Drug Development**

**Presentation 207**

Abstract Title: **Immune Cell Function & Metabolism are Affected by Bariatric Surgery in a T2D-Dependent Manner**

Author(s): S. N. Hart, Department of Molecular and Cellular Biochemistry, U of Kentucky; Dr. J. Steiner, Director of Bariatric Surgery, U of Kentucky; Dr. W. Inabnet, Surgeon-in-chief, U of Kentucky; B. N. Nikolajczyk, Pharmacology & Nutritional Sciences, U of Kentucky

**Abstract:** Type 2 Diabetes (T2D), one of the top ten causes of death worldwide, is fueled by chronic inflammation. T2D is considered a metabolic disease, and there is a great push to target metabolic and associated inflammatory pathways to ameliorate the disease & its comorbidities i.e., obesity and cardiovascular disease. The driver(s) of inflammation remains unknown; I posit that metabolic abnormalities in immune cells perpetuate T2D-associated inflammation.

Bariatric surgery has become a standard treatment for obesity that causes significant weight loss, tangentially causing patients' glycemic control to improve. However, weight loss and eventual regain is highly variable among bariatric surgery patients. Bariatric surgery's effects on immune cells, specifically immune cells in the periphery, is also thus far understudied. My project analyzes inflammation through measuring immune cell function (i.e., cytokine secretion) and immune cell metabolism (i.e., abundance of metabolites, rates of energy-producing pathways & oxidative phosphorylation) in bariatric surgery patients with versus without T2D.

Supported by: Other support for the existing CARES cohort by the NIEHS (R01ES016531, R21ES021106, R01ES02644601A1, R24ES030904, 5P30ES026529-03; P30ES023515; R24ES028522; 2T32ES010957-16); TL1 grant TL1TR001997

Primary Presenter / email: **Hart, Samantha** / [snda236@uky.edu](mailto:snda236@uky.edu)  
**Graduate Student**  
**Translational Research/Science**  
**Nutrition**

**Presentation 208**

Abstract Title: **Impacting Inflammation through Mechanistic Target of Rapamycin (imTOR)**

Author(s): B. S. Nikolajczyk, Departments of Pharmacology and Nutritional Sciences, U of Kentucky, Lexington, KY

**Abstract:** Inflammatory diseases, in part regulated by T cells, control the length of one's life spent in good health, or healthspan. The rapamycin analog everolimus, when used at low doses or intermittently, selectively inhibits mTOR complex 1 (mTORC1) in T cells, while improving multiple age-related inflammatory conditions such as metabolic and cognitive decline, and autoimmunity. The question remains whether everolimus can safely alter inflammation to promote healthspan in humans, as shown in animal studies, without the major side effects of rapamycin (immunosuppression, hyperlipidemia, and elevated HbA1c/diabetes onset). In vitro everolimus alters T cell inflammation (e.g. cytokine profiles), and lowers multiple upstream regulators including ROS, mitochondrial OXPHOS, glycolysis, and lysosomal mass. Everolimus also increases expression of CISH (cytokine-inducible SH2-containing protein), an emerging regulator of T cell inflammation. We will use a clinical trial design to test the hypothesis that low-dose/ intermittent everolimus lowers the risk of inflammation-related health problems in T cells from obese, insulin-resistant subjects. We will analyze T cells from 84 subjects aged 55-80 years before and after intervention with placebo, 0.5mg/day or 5 mg once/week everolimus. We will also analyze T cells from sixteen 18-30-year-olds as a comparator "healthy" group. We will compare T cell function among interventions by measuring cytokine production, polyfunctionality, bioenergetics, redox balance, and lysosomal structure/ function. Outcomes from this clinical trial will provide insights into an FDA-approved drug that may mitigate chronic systematic inflammation and thus healthspan in people with excess weight and no actionable metabolic decline.

Supported by: R01AG084180, BBDC, and The Departments of Pharmacology and Nutritional Sciences

Primary Presenter / email: **Gholamrezaeinejad, Niloufar/Fatemeh** / fng222@uky.edu  
**Graduate Student**  
**Clinical Trial**  
**Inflammatory Diseases**

**Presentation 209**

Abstract Title: **Gender and Racial Differences in Follow-Up Testing and Outcomes in Patients with no Known Coronary Artery Disease**

Author(s): B. Skaff and M. Parekh, Department of Internal Medicine, U of Kentucky, J. Spindel, Department of Cardiology, U of Kentucky, A. Harris, Department of Cardiology, U of Kentucky, W. McCowan, Department of Internal Medicine, U of Kentucky, V. Gupta, Department of Cardiology, U of Kentucky

**Abstract:** Study data is limited regarding coronary artery disease (CAD) diagnosis, treatment, and mortality for populations other than white males. We evaluated the impact of racial and gender differences on follow-up testing of patients presenting to the emergency department (ED) with chest pain without acute coronary syndrome (ACS).

All patients presenting to the ED for chest pain, had no prior history of CAD, and were ruled out for ACS were included. Follow-up testing (invasive coronary angiography, coronary CTA, or stress testing) performed within 90 days of ED presentation, a new diagnosis of CAD based on testing, and cardiology consultation in the ED were assessed. Independent variables were initial troponin value, age, gender assigned at birth, Caucasian vs non-Caucasian race, and presence of pathologic Q waves on EKG. The HEART score was analyzed separately to avoid confounding inherent bias.

721 patients with complete data were analyzed. Additional testing was performed in 38 patients with 4 new diagnoses of CAD. Cardiology consultation was requested in 50 patients while in the ED and had statistically significant associations with higher age, more risk factors, higher initial troponin, and pathologic Q waves, but not gender or race. Follow up testing had statistically significant associations with age, risk factors, Q waves, and gender, but not race. A higher HEART score was documented more often for males, likely contributing to the additional testing performed. There were no statistical associations with final CAD diagnosis.

There was a difference in gender and further testing, which may be due to inherent bias and/or limitations in stratification tools. This may lead to underdiagnosis of CAD in females. More contemporary and gender-sensitive tools are needed in the assessment of chest pain.

Supported by:

Primary Presenter / email: **Skaff, Brianna** / [bnsk224@uky.edu](mailto:bnsk224@uky.edu)  
**Medical Resident/Fellow**  
**Clinical Research**  
**Cardiovascular**

**Presentation 210**

Abstract Title: **Rare Overlapping Immune-Related Neuromuscular Involvement and Myocarditis Induced by Nivolumab**

Author(s): Misa Ito, Departments of Internal Medicine and Pediatrics, U of Kentucky; Amit Arbune, Departments of Internal Medicine & Divisions - Cardiology, U of Kentucky

**Abstract:** Immune checkpoint inhibitors (ICIs), such as nivolumab, have revolutionized cancer treatment by enhancing immune activation against tumor cells. Nivolumab is commonly used in advanced metastatic esophageal squamous-cell carcinoma. However, ICI therapy is associated with serious immune-related adverse events, including myocarditis, which can be life-threatening with mortality rates ranging from 25% to 50%. Concurrent ICI-induced myositis and/or myasthenia gravis occur in 30-40% of cases. We present the case of an 84-year-old male with advanced esophageal squamous-cell carcinoma who developed generalized and proximal limb weakness after receiving nivolumab. Concerning ICI-mediated myositis versus myasthenia gravis, prednisone was initiated. Elevated high sensitivity troponin levels raised suspicion for ICI-induced myocarditis. Transthoracic echocardiography revealed new left ventricular (LV) systolic dysfunction and regional wall motion abnormalities. Endomyocardial biopsy confirmed early-stage ICI myocarditis with CD8 lymphocyte-positive staining. Cardiac MRI showed an ejection fraction of 40% with hypokinesia in the inferolateral wall elevated native T1-values in the same region and no late gadolinium enhancement. The patient's hospital course was complicated by pulseless electrical activity (PEA) arrest from aspiration, and atrial flutter with rapid ventricular response, likely due to ICI-induced myocarditis and myositis/myasthenia gravis. Pulsed dose IV steroids and IVIG were administered with minimal improvement, and the patient died despite treatment. This case emphasizes the importance of recognizing overlapping immune-related adverse events in ICI therapy and having a high index of suspicion for myocarditis. Early diagnosis and prompt with high dose corticosteroid treatment are crucial to prevent morbidity and mortality in these patients.

Supported by:

Primary Presenter / email: **Ito, Misa /**  
misa.ito@uky.edu **Medical**  
**Resident/Fellow**  
**Case Study**  
**Cardiovascular**

**Presentation 211**

Abstract Title: **A Challenging Case of Primary Adrenal Insufficiency Mistakenly Labeled as Pre-diabetes**

Author(s): Misa Ito, MD, PhD, Alba Morales, MD

**Abstract:** Primary adrenal insufficiency (PAI) is a rare endocrine disorder with an incidence of approximately 10-15 per 100,000 individuals. It presents insidiously with non-specific symptoms, often leading to delayed diagnosis. We report the case of a 14-year-old girl with a 14-month history of recurrent nausea, vomiting, abdominal pain, weight loss, hyperpigmentation and fatigue. Physical examination revealed hyperpigmentation in the neck and axillary areas, initially mistaken for acanthosis nigricans. Laboratory results showed a low cortisol level, elevated ACTH, and plasma renin activity, confirming PAI. The patient's symptoms, including gastrointestinal distress and salt craving, were attributed to both glucocorticoid and mineralocorticoid deficiency. Treatment with hydrocortisone and fludrocortisone led to rapid clinical improvement, with resolution of symptoms and weight gain. This case highlights the diagnostic challenge of distinguishing PAI from other conditions with overlapping symptoms, particularly in the presence of skin and mucosal hyperpigmentation. Early recognition and appropriate testing are critical to prevent misdiagnosis and ensure prompt management.

Supported by:

Primary Presenter / email: **Ito, Misa /**  
misa.ito@uky.edu **Medical**  
**Resident/Fellow**  
**Case Study**  
**Endocrine**

Presentation **212**

Abstract Title: **From Acute Coronary Syndromes and Cardiomyopathy to Fatal Arrhythmias: Re-challenging 5-Fluoropyrimidine Cardiotoxicity**

Author(s): S.E. McMurtry, Department of Internal Medicine, U of Kentucky; S.A. Sertich, Department of Hematology and Oncology, Markey Cancer Center, U of Kentucky; A. Arbune, Department of Cardiovascular Medicine, Gill Heart Center, U of Kentucky

**Abstract:** 5-fluorouracil (5-FU) and capecitabine, are superior chemotherapeutic agents for gastrointestinal and breast cancers. 5-FU cardiotoxicity manifesting as acute coronary syndrome (ACS) or cardiomyopathy was previously a strict contraindication for continued 5-FU exposure due to the risk of recurrence. Several case studies have evaluated rechallenging using anti-anginal medications, such as nitrates and calcium channel blockers, before, during, and after exposure to 5-FU or capecitabine. While short-term studies have revealed favorable results including no further episodes of acute coronary syndrome with repeat exposure, long-term cardiovascular and oncologic outcomes have not been investigated. Fifty-six patients presented to the Cardio-Oncology clinic at the University of Kentucky from October 2020 to November 2024 who were exposed to 5-FU or capecitabine. Of the 56 patients, ten of those were re-exposed to 5-FU or capecitabine using re-challenge protocol with either nifedipine/ diltiazem and isosorbide mononitrate. Nine out of the ten did not have recurrent chest pain or ACS; one patient continued to have anginal chest pain after 5FU discontinuation. No patients had major adverse cardiovascular events and all patients who previously had reduced cardiac function after cardiotoxicity had improvement in their ejection fraction within a 6-month period. For oncologic outcomes, the average number of chemotherapy cycles patients were able to tolerate was 6.1 cycles with one patient completing 29 cycles. The average survival months after 5-FU cardiotoxicity was 16.6-months. While positive cardiovascular outcomes are seen with re-exposure to 5-FU or capecitabine, further studies on oncologic outcomes are needed in comparison to patients who pursued inferior treatments.

Supported by:

Primary Presenter / email: **McMurtry, Shyla** / semc271@uky.edu  
**Medical Resident/Fellow**  
**Clinical Research**  
**Cardiovascular**

**Presentation 213**

Abstract Title: **Diagnosis, Treatment and Outcome of Histoplasma Meningitis: A Case Series from 2015 to 2022 in A Tertiary Care Center**

Author(s): N. Meade, Department of Internal Medicine, Division of Infectious Diseases, U of Kentucky; N. Leedy, Department of Internal Medicine, Division of Infectious Diseases, U of Kentucky; T. Myint, Department of Internal Medicine, Division of Infectious Diseases, U of Kentucky

**Abstract:** Background: Histoplasma meningitis can be difficult to diagnose and treat. There is limited data on the outcome and long-term consequences.

Methods: This is a retrospective chart review of patients who were diagnosed with Histoplasma meningitis from 2015-2022.

Findings: Ten Caucasian patients, 40% male with median age of 48 were identified. Six out of 10 patients were immunosuppressed. Two patients each had HIV/AIDS (average CD4 count of 128), solid organ transplants and myasthenia gravis. The mean CSF WBC count was 31 and all CSF fungal cultures were negative. CSF Histoplasma antigen was positive in 8 out of 9 patients. Fungal blood culture was positive in 14% (1/7). Urine and serum Histoplasma antigen were positive in 100% (10/10) and 67% (2/3) respectively. Fungal serology was positive in 77.8% (7/9) patients. CT/MRI findings were abnormal in 67% (6/9) patients. All patients were treated with IV liposomal amphotericin B with an average duration of 4.1 weeks. It was followed by itraconazole maintenance therapy for at least one year. Posaconazole was used in two patients who did not tolerate itraconazole.

Three patients relapsed due to noncompliance in two patients and unable to tolerate itraconazole in one patient. Two patients had paralysis. One patient each had seizure disorder and visual impairment. Three patients died within 4 months of diagnosis, two additional patients died at 6 and 7 years after the diagnosis. One patient lost follow up.

Conclusions: Histoplasma histoplasmosis had high mortality and caused relapsed and long-term complications such as paralysis, seizure and visual disturbances.

Supported by: UK CCTS Investigators

Primary Presenter / email: **Meade, Nicholas** / [nicholas.meade@uky.edu](mailto:nicholas.meade@uky.edu)  
**Medical Resident/Fellow**  
**Clinical Research**  
**Infectious Disease**



**Presentation 214**

Abstract Title: **Immune checkpoint inhibitor-induced myocarditis and overlap syndrome in the Bluegrass Region: Case Series.**

Author(s): A.Arbune, Department of Internal Medicine and Department of Cardiology-Oncology, U of Kentucky; J.Torres Yee, Department of Internal Medicine and Department of Hematology/Oncology, U of Kentucky; C.Williams, Department of Internal Medicine, U of Kentucky; S.McMurtry, Department of Internal Medicine, U of Kentucky; M.Ito, Department of Internal Medicine, U of Kentucky; J.Hurley, Department of Internal Medicine SOM, U of Kentucky, A.Bisen, Department of Internal Medicine, India

**Abstract:** The current series of cases identified and further analyzed after selection was made following their initial diagnosis at a large tertiary academic center in the Bluegrass region demonstrated differences when compared to others noted in the literature including cancer types. Diagnosis of ICI myocarditis can be either pathohistological or clinical. Tissue findings of multifocal inflammatory cell infiltrates with overt cardiomyocyte loss by light microscopy or abnormal serum cardiac biomarker elevation (new or significantly changed from baseline) as well as CMR findings may be used respectively during evaluation, and after exclusion of ACS and acute infectious myocarditis based on degree of clinical suspicion at presentation. The American Society of Clinical Oncology (ASCO) guidelines and review of systematic reviews provide some guidance in this settings, though not ubiquitous to our patient rural/urban community. Treatment of ICI related myocarditis remains challenging in our practice as well as other immune-related adverse events such as myositis, myopathy, myasthenia gravis which can all present at the same time, and in some cases following single dose exposure as described prior. We aim at improving in future cancer related outcomes in TMOS patients of the Bluegrass region by increasing awareness and sharing expert guidance in adjunct to other sub-specialty recommendations. We propose the implementation of standard protocols for use in non-academic medical settings of the Bluegrass region created by our sub-specialty experts using tools ubiquitous to all medical practices and provide guidance to medical practitioners during the initial management of these complex patients presenting with prodrome of weakness/myositis and possible early signs or symptoms suggestive of cardiac involvement.

Supported by:

Primary Presenter / email: **Torres Yee, Jennifer / jcto233@uky.edu**  
**Medical Resident/Fellow Translational  
Research/Science  
Cardiovascular**

Presentation 215

Abstract Title: **Asprosin is a Hypertensive Adipokine**

Author(s): Rubab Akbar, Division of Endocrinology, Department of Internal Medicine, U of Kentucky; Yang He, Jan and Dan Duncan Neurological Research Institute, Baylor College of Medicine, Houston, TX; Layne Voisard, Department of Biology, U of Kentucky; Wen Su, Department of Physiology, U of Kentucky; Ming C. Gong, Department of Physiology, U of Kentucky

**Abstract:** Hypertension is a major risk factor for cardiovascular disease and is closely linked to metabolic syndrome (MS) through complex and multifactorial mechanisms. Asprosin, a recently discovered adipokine, is positively correlated with several metabolic disorders, including obesity, type 2 diabetes, fatty liver disease, and cardiovascular conditions such as coronary artery disease and hypertension. Herein, we identified blood pressure (BP) modulation as a novel neural function of asprosin. Previously, we demonstrated that asprosin regulates appetite through Ptprd (Protein Tyrosine Phosphatase Delta) signaling in hypothalamic AgRP neurons and thirt through Ptprd signaling in cerebellar Purkinje neurons. In this study, we revealed that asprosin also engages Ptprd in oxytocinergic neurons to modulate BP. Asprosin-deficient mice (a model of human Neonatal Progeroid Syndrome, NPS) and mice with oxytocin neuron-specific Ptprd deletion exhibited significantly lower BP compared to age- and sex-matched littermate controls. Notably, these mice maintained normal appetite, water intake, energy expenditure, activity levels, and respiratory exchange ratio, indicating that asprosin's BP-modulatory effects occur independently of its metabolic functions. Furthermore, oxytocin neuron-specific Ptprd knockout mice displayed hyperosmolar urine and increased renin-angiotensin-aldosterone system (RAAS) activity, suggesting a compensatory peripheral response to neurogenic hypotension. Mechanistically, asprosin treatment significantly attenuated oxytocin neuron firing and resting membrane potential, while Ptprd deletion in oxytocin neurons led to increased c-Fos expression, indicative of heightened neuronal activation. Overall, this study establishes asprosin as a key regulator of BP via oxytocinergic Ptprd signaling, providing novel insights into neurogenic hypertension and potential therapeutic strategies for its treatment.

Supported by: COCVD COBRE Pilot grant (5P30GM127211-05, PI: (Ila Mishra) and WashU Diabetes Research Center Pilot and Feasibility Award (PI: Ila Mishra).

Primary Presenter / email: **Akbar, Rubab** / rak236@uky.edu  
**Postdoctoral Scholar/Fellow**  
**Basic Research**  
**Cardiovascular**

**Presentation 216**

Abstract Title: **Modeling Intra- and Intermolecular Cooperativity Between Myosin Heads Using Spatially-Explicit Simulations.**

Author(s): C. Squarci, Division of Cardiovascular Medicine, U of Kentucky; T. Kampourakis, Division of Cardiovascular Medicine, U of Kentucky; K. S. Campbell, Division of Cardiovascular Medicine, U of Kentucky;

**Abstract:** Cardiac muscle contraction arises from the cyclical interaction between sarcomeric proteins actin and myosin. Regulation of muscle contraction is primarily driven by the calcium-dependent activation of the actin-containing thin filament. However, an additional mechanism on the thick filament has been discovered in which myosin controls itself through autoinhibitory interaction between the two heads in a dimer. The structural basis of this inactivated, or OFF state is the interactive-heads motif (IHM). This conformation is stabilized by intramolecular interaction, with one free head blocking the other, and by the interactions with myosin heads in the adjacent crowns. The transition from the IHM toward an active conformation is regulated through phosphorylation of the regulatory light chain (RLC) located below the myosin head. Despite the increasing interest in this transition as a possible modulator of cardiac output, there are still unanswered questions. The effect of RLC phosphorylation on individual head kinetics and inter-head cooperativity has remained largely elusive. Moreover, the discovery that IHM can interact differently with adjacent crowns and myosin-binding protein C depending on its conformation opens the doors to new hypotheses on how heads with different intermolecular interactions may exhibit a different regulation. In this work, I will use the myofilament spatially explicit model FiberSim, to explore the dynamics between the two heads of a dimer when the RLC is phosphorylated and if this regulation is affected by the different structures of IHM.

Supported by: NIH award: R01HL146676

Primary Presenter / email: **Squarci, Caterina** / [caterina.squarci@uky.edu](mailto:caterina.squarci@uky.edu)  
**Postdoctoral Scholar/Fellow**  
**Translational Research/Science**  
**Cardiovascular**

**Presentation 217**

Abstract Title: **Cdkn2a Variants exacerbate DNA Damage-Associated Myocardial Fibrosis in Various Cardiomyopathies**

Author(s): N. Daneshgar, Department of Physiology, U of Kentucky; Division of Cardiovascular Medicine, U of Kentucky; T. Kampourakis, Department of Physiology, U of Kentucky; Division of Cardiovascular Medicine, U of Kentucky; K. S. Campbell, Department of Physiology, U of Kentucky; Division of Cardiovascular Medicine, U of Kentucky

**Abstract:** Fibrosis is central to myocardial repair after infarction and in heart failure, yet excessive fibrotic remodeling contributes to cardiac dysfunction. Recent evidence implicates DNA damage and premature cellular senescence—mediated by the p16 protein encoded by Cdkn2a—in the regulation of tissue fibrosis, although its role in the heart remains unclear. We hypothesized that Cdkn2a variants may disrupt the DNA damage response and senescence pathways, thereby promoting adverse myocardial fibrosis in cardiomyopathies.

We analyzed genomic data from 349 patients in our cardiac biobank with various cardiomyopathies to identify single nucleotide variants (SNVs) in Cdkn2a. Seven unique SNVs were detected in 27 patients, encompassing both ischemic and non-ischemic etiologies. Myocardial tissues from these patients were evaluated for DNA damage using gamma-H2AX immunostaining. Additionally, in silico analyses were performed to predict the impact of these variants on p16 protein stability and protein–protein interactions.

Cardiac tissues harboring Cdkn2a variants demonstrated significantly elevated gamma-H2AX levels compared with controls (ischemic:  $p = 0.0003$ ; non-ischemic:  $p < 0.0001$ ), indicating increased DNA damage. Moreover, in silico analyses predicted that these variants compromise p16 protein stability and protein–protein interactions, thereby reinforcing their contribution to adverse cardiac remodeling and fibrosis.

Our study reveals that Cdkn2a variants correlate with increased DNA damage and fibrosis in cardiomyopathy patients, implicating dysfunctional p16-mediated senescence in pathological cardiac remodeling. These findings provide a rationale for further exploration of DNA damage-targeted therapies to mitigate fibrosis in heart disease.

Supported by: NIH reward: R01HL163977 and NIH reward: R01HL173989

Primary Presenter / email: **Daneshgar, Nastaran** / [nastaran.daneshgar@uky.edu](mailto:nastaran.daneshgar@uky.edu)  
**Postdoctoral Scholar/Fellow**  
**Translational Research/Science**  
**Cardiovascular**

**Presentation 218**

**Abstract Title:** **Liver-specific CPT1a Deletion Promotes Tumorigenesis in a Mouse Model of Obesity-driven Hepatocellular Carcinoma**

**Author(s):** G. B. Anspach, Department of Internal Medicine - Division of Endocrinology, Diabetes, and Metabolism; R. Flight, Department of Molecular & Cellular Biochemistry; N. Dharanipragada, Department of Internal Medicine - Division of Endocrinology, Diabetes, and Metabolism; H. Moseley, Department of Molecular & Cellular Biochemistry; R. N. Helsley, Department of Internal Medicine - Division of Endocrinology, Diabetes, and Metabolism, University of Kentucky, Lexington, KY

**Abstract:** Background: Metabolic dysfunction-associated steatotic liver disease (MASLD) is the fastest-growing etiology of hepatocellular carcinoma (HCC). The primary goal of this project is to determine the contribution of carnitine palmitoyltransferase 1a (CPT1a)-mediated fatty acid oxidation (FAO) to MASLD-HCC etiology. Methods: Eight paired HCC tumor and adjacent non-tumor samples were collected from patients with suspected MASLD-HCC and subjected to histological analysis, lipidomics, and RNA sequencing. Four to five day old CPT1aF/F and liver-specific CPT1a KO (LKO) pups were treated with 7,12-dimethylbenz[a]anthracene and fed the GAN diet (40% kcal fat; Research Diets) until 34 weeks of age. Mice were necropsied after a 24-hour fast, liver images were captured for gross assessment, and tissues collected.

Results: Histological analysis by hematoxylin and eosin (H&E) showed significant lipid vacuole accumulation in HCC tumors relative to nontumor tissue. Lipidomics analyses revealed significant increases in long-chain non-esterified monounsaturated fatty acids (MUFAs; C16:1, C18:1, C20:1) and MUFA-enriched phospholipids (PC30:1, PC32:1, PE32:1, and PC36:1) in tumors. Consistent with lipid profiles, FAO genes (CPT1A, CPT2, ACADL, ACADM, ACADS, HADHA) were significantly lower in tumor versus nontumor tissue. In mice, CPT1a deletion increased liver weight to body weight ratios by 50% (P=0.0003). Preliminary analyses revealed CPT1a LKO increased overall tumor number and size in male mice, while no observable differences in tumor penetrance were noted in female mice.

Conclusions: These results suggest HCC tumors exhibit a reduced capacity to undergo mitochondrial  $\beta$ -oxidation resulting in accumulation of free- and esterified-MUFAs with a concomitant reduction in MUFA-carnitines. Current studies are underway to determine mechanisms by which MUFAs and the impairment of hepatic MUFA catabolism through FAO promotes the development of HCC and tumor growth in male mice.

Supported by: K01DK128022, UL1TR001998, 23CDA1051959, IRG2215234, P30GM127211, P30CA177558

Primary Presenter / email: **Anspach, Garrett** / gban222@uky.edu  
**Professional Student (MD, PharmD, Dentistry, PT)**  
**Basic Research**  
**Cancer**

**Presentation 219**

Abstract Title: **Evaluation of Privacy-Focused Endoscopy Data Extraction Using a Lightweight Open-Source Local Language Model**

Author(s): R. J. Fine, U of Kentucky College of Medicine; B. Ismail, Department of Internal Medicine-Digestive Health, U of Kentucky; H. G. Darnell, Department of Internal Medicine, U of Kentucky

**Abstract:** Large language models (LLMs) have shown varying capabilities in healthcare data extraction. However, commercial LLMs require data to be sent to remote servers, making them unsuitable for handling identified patient information.

This study evaluates the performance of a light-weight open-source LLM (gemma2:9b-instruct-q4\_0) in a local setting. We tested the model's ability to extract 23 variables from upper endoscopy reports (n=88) using a standard work computer (Intel i5-10500 CPU, 16 GB RAM, Windows 10, no GPU). The extraction process utilized a detailed instruction-based zero-shot prompt, providing specific descriptions for each variable. This set-up ensured complete on-device processing without external data transmission.

The median agreement between LLM and human extractions was 93% (range: 78-100%), with 23 reports achieving 100% agreement, 66 exceeding 90%, and only 2/88 reports falling below 80% agreement. Overall agreement for individual variables was high, with a median kappa of 0.89 (range: 0.6-1.0). All variables except one (patulous esophagus detection) showed statistically significant agreement ( $p < 0.05$ ). Perfect agreement (kappa=1) was noted for 8 variables, while 8 had excellent agreement (kappa > 0.9). However, 7 variables showed suboptimal agreement (kappa < 0.8). When we re-ran the model to extract only these 7 low-agreement variables, performance improved, with 2 variables (recommended repeat scope and recommended repeat interval) reaching kappa > 0.8.

The described approach offers an accessible, privacy-preserving tool for automated data extraction using available standard computer hardware, promising for healthcare settings prioritizing data security. While challenges persist with certain variable types, our results reveal significant optimization potential when extracting fewer variables concurrently.

Supported by:

Primary Presenter / email: **Fine, Rebecca / rfi236@uky.edu**  
**Professional Student (MD, PharmD, Dentistry, PT)**  
**Translational Research/Science**  
**GI**

Presentation 220

Abstract Title: **Overexpression of SAA in the liver promotes atherosclerosis in apolipoprotein E-deficient mice lacking SAA**

Author(s): A. Li, Cardiovascular Research Center, U of Kentucky; L. Meredith, Cardiovascular Research Center, U of Kentucky; L. Thomas, Cardiovascular Research Center, U of Kentucky; A. C. Trumbauer, Case Western Reserve University; V. P. Noffsinger, Cardiovascular Research Center, U of Kentucky; N. R. Webb, Department of Pharmacology and Nutritional Sciences, U of Kentucky; L. R. Tannock, Department of Internal Medicine, U of Kentucky; P. Shridas, Department of Internal Medicine, U of Kentucky

**Abstract:** Objectives: Persistent elevation of serum amyloid A (SAA) is linked to increased cardiovascular risk. Murine studies suggest SAA plays a causal role in atherogenesis, not merely acting as a biomarker. Using a doxycycline-inducible transgenic system, we show that liver-specific, but not adipocyte-specific, overexpression of SAA1.1 promotes atherosclerosis in apolipoprotein E-knockout (apoE KO) mice lacking SAA1.1, SAA2.1, and SAA3 (TKE).

Approach and Results: Atherosclerosis was assessed in 12-week-old apoE KO and TKE mice. TKE groups included mice with liver-specific (TgL-TKE) or adipocyte-specific (TgF-TKE) doxycycline-inducible SAA1.1 transgenes, alongside controls expressing only reverse tet-transactivator without an SAA gene (TetL-TKE and TetF-TKE). Mice were fed standard diets and given doxycycline (1 mg/mL) in drinking water for 8 weeks. Plasma lipids were measured at 3, 5, and 8 weeks, with atherosclerosis quantified at study completion. Plasma SAA, total cholesterol, triglyceride, and non-HDL cholesterol levels were significantly higher in TgL-TKE mice compared to all other groups. Atherosclerotic lesion areas were significantly larger in TgL-TKE male ( $6.2 \pm 2.8\%$ ) and female ( $11.7 \pm 4.6\%$ ) mice than in TetL-TKE males ( $0.8 \pm 0.2\%$ ) and females ( $1.0 \pm 0.2\%$ ). No differences were observed in lesion areas between TgF-TKE and TetF-TKE mice.

Conclusions: Liver-specific overexpression of SAA induces atherosclerosis, accompanied by elevated non-HDL cholesterol, emphasizing the causal role of hepatic SAA in cardiovascular disease.

Supported by: NIH R01 HL147381 (to LT and PS)

Primary Presenter / email: **Li, Ailing** / [ailing.ji@uky.edu](mailto:ailing.ji@uky.edu)  
**Staff**  
**Basic Research**  
**Cardiovascular**

**Presentation 221**

Abstract Title: **Infiltrative Cardiomyopathies Display Decreased Phosphorylation of Thick and Thin Filament Regulatory Proteins**

Author(s): F. Mumbi, Department of Internal Medicine, U of Kentucky; N. Egal, Department of Internal Medicine, U of Kentucky; A. Gauthier, Department of Internal Medicine, U of Kentucky; A. Wellette-Hunsucker, Department of Physiology, U of Kentucky; U. Gulbulak, Division of Cardiovascular Medicine, Department of Internal Medicine, U of Kentucky; G. Milburn, Department of Physiology, U of Kentucky; K. Campbell, Departments of Physiology and Internal Medicine, U of Kentucky.

**Abstract:** Infiltrative cardiomyopathies are a subset of restrictive cardiomyopathies characterized by the aggregation of abnormal proteins, cells, or materials in the myocardium. This results in increased fibrosis, thickening of the heart walls, and heart failure. The two most common types of infiltrative cardiomyopathy are cardiac sarcoidosis and amyloidosis. These infiltrative cardiomyopathies primarily impact the extracellular matrix, but it is unclear how cardiomyocyte contractile function is impaired. Within the sarcomere, the thick filament can be regulated by phosphorylation of myosin binding protein C (MyBP-C) while phosphorylation of troponin I (TnI) can regulate the thin filament. MyBP-C and TnI have been shown to be hypophosphorylated in dilated cardiomyopathy (DCM) but have not been investigated in infiltrative cardiomyopathies. Left ventricle samples from patients with cardiac sarcoidosis and amyloidosis were analyzed by western blot. Phospho-specific antibodies were used to assess phosphorylation of MyBP-C at Ser273, Ser282, and Ser302. TnI phosphorylation was measured using Phos-tag gel electrophoresis. Compared to non-failing donors, amyloidosis and sarcoidosis myocardium had decreased phosphorylation of TnI, MYBP-C Ser273, and MYBP-C Ser282. However, only sarcoidosis myocardium had decreased phosphorylation at Ser302. The decreased phosphorylation of MyBP-C at Ser273 and Ser282 and TnI may reflect altered protein kinase A (PKA) activity. Decreased phosphorylation at Ser302 was only observed in sarcoidosis and may be due to altered protein kinase C (PKC) activity. To understand the sarcomere function difference, additional kinase and ATPase measurement need to be done. These results may show that molecular alteration in DCM is analogous to infiltrative cardiomyopathies.

Supported by: NIH HL149164 (KSC), NIH F31HL170558 (AWH), and AHA 24PRE1191551 (GM).

Primary Presenter / email: **Mumbi, Florence** / fmu247@uky.edu  
**Staff**  
**Translational Research/Science**  
**Cardiovascular**



Presentation 222

Abstract Title: **Six Month Physical Activity Levels in Survivors of Critical Illness**

Author(s): L. A. Summers, Division of Pulmonary, Critical Care, Sleep Medicine, U of Kentucky; F. González-Seguel, Department of Physical Therapy, U of Kentucky; L.E. Fresenko, Physical Therapy Program, U of Toledo; A.G. Kalema, Division of Pulmonary, Critical Care, Sleep Medicine, U of Kentucky; A. A. Montgomery-Yates, Division of Pulmonary, Critical Care, Sleep Medicine, U of Kentucky; E. Dupont-Versteegden, Department Physical Therapy, U of Kentucky; K.P. Mayer, Department of Physical Therapy U Kentucky

**Abstract:** RATIONALE: Limited data exists on physical activity levels in patients who survive the intensive care unit (ICU) as they recover and transition back into the community. The purpose of this study is to quantify daily step counts across three time points. METHODS: We conducted a 6-month prospective observational study of adult survivors of ICU. Patients diagnosed with acute hypoxic respiratory failure or sepsis ( $\geq 18$  years) who were ambulatory prior to hospitalization were enrolled in the study within 30 days of discharge. Patients wore a Garmin Vivo-Fit for a minimum of 10 days to establish mean daily step counts at three time points: post hospital discharge, 3 months, and 6 months. Mean and standard deviations were calculated for step counts and paired t-tests determined significant differences ( $p < 0.05$ ). RESULTS: Forty-three participants had a mean age of  $55.9 \pm 12.9$  years and 40% female. Clinical metrics included an average hospital stay of 25.4 days ( $\pm 20.5$  days). Step counts averaged  $2,558 \pm 2,044$  steps at post-discharge,  $3,860 \pm 2,741$  at 3 months, and  $3,551 \pm 2,000$  at 6 months after discharge, showing a significant increase from post-discharge to 3 months ( $p = 0.009$ ) but no significant change from 3 to 6 months ( $p = 0.559$ ). At 6 months, the mean step counts were below the typical range for healthy adults aged 55 years (4,000–18,000 steps). CONCLUSIONS: The findings emphasize that survivors of critical illness may require dedicated follow up through six months following hospitalization to regain normal aged, related levels of physical activity.

Supported by: The work is supported by the NIH R01AR081002 and K23AR079583.

Primary Presenter / email: **Summers, Louisa** / [louisa.summers@uky.edu](mailto:louisa.summers@uky.edu)  
**Staff**  
**Translational Research/Science**  
**Pulmonary**

**Presentation 223**

Abstract Title: **Disparities in physical rehabilitation: A comparative study of Hispanic vs non-Hispanic adults with critical COVID-19**

Author(s): S. Shankara Bhaktula, Department of Internal Medicine & Divisions- Pulmonary and critical care, U of Kentucky, A. A. Montgomery-Yates, Department of Internal Medicine & Divisions-Pulmonary and critical care, U of Kentucky, A. G. Kalema, Department of Internal Medicine & Divisions-Pulmonary and critical care, U of Kentucky, A. Salyer, M. K. Soper, K. P. Mayer, Department of Physical Therapy, U of Kentucky F. González-Seguel, Department of Physical Therapy, U of Kentucky

**Abstract:** Objective: To determine whether Hispanic adults admitted with critical COVID-19 receive different intensive care unit (ICU) physical rehabilitation compared to non-Hispanic adults.  
Methods: A retrospective secondary multi-site data analysis was conducted on 3,694 critical COVID-19 adults, comparing Hispanic (n=269) and non-Hispanic (n=3425) adults. Patient demographic and clinical variables include age, body mass index (BMI), hospital length of stay (LOS), ICU LOS, and mechanical ventilation (MV) duration. Independent samples t-tests compared rehabilitation related variables: days to first physical therapy (PT) and occupational therapy (OT) session, and PT/OT frequency (sessions per day).  
Results: Hispanic patients were younger (58±16 years vs 64±1, p<0.001), with no significant difference in BMI. Hispanic patients had longer hospital LOS (18±18 days vs 16±15 days, p=0.011), longer ICU LOS (12±14 days vs 8±11 days, p<0.001), and longer MV duration (17±14 days vs 13±14 days, p=0.003). Significant delays were observed in rehabilitation initiation for Hispanic patients. longer time to first PT (10±10 vs 7±7 days, p<0.001) and first OT session (12±11 vs 7±7 days, p<0.001) compared to non-Hispanic adults. PT frequency was similar between groups (0.2±0.1 vs 0.2±0.1 sessions/day, p=0.410), while OT frequency was slightly higher for Hispanic patients (0.19±0.12 vs 0.17±0.11 sessions/day, p=0.001).  
Conclusions: Despite being younger, Hispanic adults with critical COVID-19 had longer hospital/ICU LOS, and prolonged MV compared to non-Hispanic adults. Notably, they experienced significant delays of between 3 and 5 days in the initiation of PT and OT, respectively. These disparities highlight the need for timely ICU rehabilitation for Hispanic adults.

Supported by: Funding support for Felipe González-Seguel was provided in part by the Center for Health, Engagement, and Transformation (CHET) at the University of Kentucky.

Primary Presenter / email: **Shankara haktula, Srushan / ssh486@uky.edu**  
**Staff**  
**Clinical Research**  
**Education**

Presentation 224

Abstract Title: **Restoration of the Sympathoadrenal response to Hypoglycemia in Rodents Following Periods of Hypoglycemia Avoidance**

Author(s): A. R. Marksbury, Department of Internal Medicine (IM) - Endocrinology, University of Kentucky (UK); M. M Wooten, IM - Endocrinology, UK  
M. B. Music, IM - Endocrinology, UK; M. H. Devore, Department of Pharmacology and Nutritional Sciences, UK; Z. A. Beckner, Department of Pharmacology and Nutritional Sciences, UK; L. A. Schoeder, IM - Endocrinology, UK; N. G. Phelps, IM - Endocrinology, UK; E. L Macon, IM - Endocrinology, UK; S. J. Fisher, IM - Endocrinology, UK

**Abstract:** Hypoglycemia-associated autonomic failure (HAAF) is a critical complication in individuals with type 1 diabetes and advanced type 2 diabetes. HAAF is characterized by a blunted counterregulatory response and an impaired awareness of hypoglycemia. This study investigates whether the counterregulatory response can be restored by avoiding subsequent hypoglycemic events. In this experiment, 10-week-old male Sprague-Dawley rats were subjected to recurrent hypoglycemia followed by 0 (RS, n=6; RH, n=7), 1 (1wk, n=8), 3 (3wk, n=7), or 5 (5wk, n=8) weeks of hypoglycemia avoidance. Following hypoglycemia avoidance, all animals then underwent the gold-standard hyperinsulinemic-hypoglycemic clamp to evaluate the counterregulatory response using epinephrine, norepinephrine, and glucagon hormone analysis.

Rodents subjected to insulin-induced hypoglycemia (RH, 1wk, 3wk, 5wk) for three consecutive days were successfully induced with a blunted counterregulatory response. Avoiding hypoglycemia for three weeks restored the epinephrine response to hypoglycemia ( $4500 \pm 700$  pg/mL,  $P < 0.0005$ , 3wk vs. RH) while the norepinephrine response was restored after five weeks of hypoglycemia avoidance ( $960 \pm 60$  pg/mL,  $P < 0.005$ , 5wk vs. RH). The glucagon response, however, showed no improvement after five weeks. Additionally, no significant changes in glucose infusion rates during the glucose clamp were observed, indicating persistent impairments in the counterregulatory response.

These findings suggest the counterregulatory response to hypoglycemia can be partially restored by avoiding hypoglycemia, as indicated by the restored catecholamine hormone response and the persisting glucagon response impairment after five weeks of hypoglycemia avoidance. Further research is needed to determine if longer recovery periods will lead to a fully restored counterregulatory response.

Supported by: NIDDK R01DK118082

Primary Presenter / email: **Marksbury, Ashlee** / ama623@uky.edu  
**Staff**  
**Translational Research/Science**  
**Other**

**Presentation 225**

Abstract Title: **Obesity-Associated Inflammatory Responses are Significantly Modified by Insulin Sensitivity and Sex**

Author(s): A. Javidan, Department of Pharmacology and Nutritional Sciences, U of Kentucky; L. Bharath, Merrimack College; E. Tevonian, Massachusetts Institute of Technology; B. Marrah, UW-Madison; A. Konopka, School of Medicine and Public Health, UW-Madison; B. Miller, Oklahoma Medical Research Foundation; M. Bubak, Oklahoma Medical Research Foundation; D. A. Lauffenburge, Massachusetts Institute of Technology; B. S. Nikolajczyk, Department of Microbiology, Immunology and Molecular Genetics, U of Kentucky

**Abstract:** Introduction: Systemic inflammation promotes insulin resistance (IR) and comorbidities like type 2 diabetes. Multiple CD4<sup>+</sup> T cell subsets support inflammation in people with excess weight or obesity (herein, obesity). Autophagy is one key mechanism that regulates T cell-generated cytokines and thus inflammation. We tested the hypothesis that obesity-associated changes in T cell autophagy support inflammation and declines in metabolic health by analyzing T cells from obese insulin-sensitive (IS) and IR subjects for cytokine production utilizing a single-cell proteomics platform, and for indicators of autophagy.  
Methods: Archived PBMCs from IS (HOMA-IR < 2.2; N=7) or IR (HOMA-IR > 2.5; N=7) subjects (BMI avg. 32.5, avg age 56.3 yrs) were recovered overnight with IL-2. CD4<sup>+</sup> T cells were negatively isolated from PBMCs using magnetic beads, then stimulated with phorbol ester and ionomycin for 1.5-6 hours to induce (1) autophagy, analyzed by confocal microscopic quantification of lipidated LC3, p62, and LAMP1; and (2) inflammation, based on combinatorial cytokine profiles generated by partial least squares discriminant analysis of up to 25 cytokines produced by each cell.  
Results: T cells from IR compared to IS subjects produced a cytokine profile dominated by IL-12 that was similar to a type 2 diabetes T-cell profile. T cells from men compared to women unexpectedly produced a more inflammatory profile. Confocal analysis showed defective autophagy in the IR group compared to IS, as indicated by reduced lipidated LC3B, increased p62, and decreased LC3B/LAMP1 colocalization.  
Conclusions: Obesity-associated IR is a more inflamed state than IS (as expected), with CD4<sup>+</sup> T cells from men specifically showing more production of cytokines typical of type 2 diabetes.

Supported by: National Institute on Aging: R01AG079525-03

Primary Presenter / email: **Javidan, Aida** / aja252@uky.edu  
**Staff**  
**Translational Research/Science**  
**Other**

**Presentation 226**

Abstract Title: **Sarcomere-level Contractility in Heart Failure**

Author(s): Susma Sah (Undergraduate); Caterina Squarci, Kenneth Campbell (Internal Medicine at The University Of Kentucky)

**Abstract:** Heart failure occurs when the heart is unable to pump blood efficiently. This could be caused by dysfunction at the level of the fundamental units of muscle, the sarcomeres. Although cardiovascular research has focused more on sarcomeres and sarcomeric proteins in the past few years, their role in the progression of cardiac dysfunction is not fully clarified. This is partially due to the difficulties in performing measurements on the sub-cellular level.

In this work, I will perform mechanical measurements on single myofibrils to test the hypothesis that in heart failure contractility is impaired in terms of force production and relaxation, compared to healthy hearts. A myofibril is composed of a single string of sarcomere. This allows fine control of activation and relaxation making myofibrils the best model to study sarcomeres' behavior. Myofibrils will be extracted from the ventricular myocardium of both study groups (heart failure patients and organ donors) and activated and deactivated with a fast-switching solution technique that allows the production of a physiological force profile.

I expect less force production and a slower relaxation in heart failure samples compared to organ donors.

With this study, I hope to enhance the understanding of sarcomeres' involvement in heart failure to help clinicians develop more targeted therapies.

Supported by:

Primary Presenter / email: **Sah, Susma** / ssa446@uky.edu  
**Undergraduate Student**  
**Translational Research/Science**  
**Muscle**

**Presentation 227**

Abstract Title: **Deletion of Carnitine Palmitoyltransferase 1a from Adipocytes Leads to Insulin Resistance in Female Mice**

Author(s): N. Dharanipragada, Department of Internal Medicine, U of Kentucky; G. B. Anspach, Department of Internal Medicine, U of Kentucky; Robert N. Helsley, Department of Internal Medicine, U of Kentucky

**Abstract:** Background: Carnitine palmitoyltransferase 1 (CPT1) is the rate-limiting enzyme in mitochondrial fatty acid oxidation (FAO). Our laboratory and others have shown that CPT1a is the most abundant CPT1 enzyme in white adipose tissue (WAT) in mice and humans, prompting an investigation into its role in adipocyte biology. Methods: CRISPR-Cas9N was used to delete CPT1a in 3T3-L1 fibroblasts. WT and CPT1a KO cells were used to study adipocyte differentiation and insulin responses in-vitro. For in-vivo studies, eight-week old male and female AKO (Cpt1a $\Delta$ Adipo) and littermate controls (Cpt1a $F/F$ ) were placed on a high-fat diet (HFD; 60% kcal fat) for 16 weeks. Glucose and insulin tolerance tests were completed after 11 and 13 weeks on diet. Mice were necropsied after a 16 hour fast, and tissues and serum were collected for insulin and C-peptide analysis, bulk RNA sequencing, and protein expression by immunoblotting.

Results: Murine 3T3L1 KO cells exhibited increased adipocyte differentiation, which was accompanied by a ~50% increase in triglycerides and a 4-5 fold increase in expression of known adipogenic markers. Despite comparable IR $\beta$  phosphorylation, fully differentiated KO adipocytes had reduced Akt and Erk phosphorylation in response to insulin treatment, as compared to controls. Deletion of CPT1a from adipose tissue of female mice resulted in increased body weight and subcutaneous adiposity in response to HFD, as compared to littermate controls. Further, female Cpt1a $\Delta$ Adipo mice displayed a 2-fold increase in fasting insulin and insulin to C-peptide ratios, which coincided with glucose intolerance and insulin resistance in these mice. No changes were observed in male mice across all parameters tested.

Conclusions: Deletion of CPT1a in adipose tissue promotes sex-specific responses in adiposity and insulin resistance. Future research will determine mechanisms by which substrates and products of CPT1a impact insulin signaling in adipocytes.

Supported by: This work was supported in part by the National Institutes of Health grants K01DK128022, IRG2215234, UL1TR001998, P30GM127211, and AHA CDA 23CDA1051959 to RNH. This work was also supported by the Undergraduate Summer Training in Cardiovascular Research

Primary Presenter / email: **Dharanipragada, Nikitha** / ndh226@uky.edu  
**Undergraduate Student**  
**Basic Research**  
**Internal Medicine**

Presentation **228**

Abstract Title: **7-BIA: A Small Molecule PTPRD Antagonist for Treatment of Metabolic Syndrome**

Author(s): L. Voisard, Department of Biology, U of Kentucky; R. Akbar, Department of Physiology, U of Kentucky; I. Mishra, Departments of Physiology and Internal Medicine, Division of Endocrinology, U of Kentucky, Lexington, KY

**Abstract:** Diabetes is a global health crisis, affecting about 530 million adults. Type 2 diabetes (T2DM) constitutes about 98% of all diabetes cases. This is compounded by a complex interplay of various metabolic syndrome (MS) factors, including obesity, insulin resistance, hypertension, and dyslipidemia, all contributing to the surge in T2DM cases. Asprosin, a recently discovered metabolic adipokine, shows strong association with conditions of MS including T2DM, obesity, fatty liver, PCOS, and hypertension. Two distinct functions of asprosin have been identified: triggering hepatic gluconeogenesis and stimulating hunger through AgRP (Agouti-related peptide) neurons. Given the widespread distribution of asprosin's receptor Ptprd (Protein Tyrosine Phosphatase type  $\delta$ ), it is plausible that asprosin has additional non-canonical metabolic functions.

Ptprd is highly expressed in pancreatic  $\beta$  cells.  $\beta$  cells, when treated with asprosin, show impaired insulin production, inflammation, and apoptosis. Oxytocin neurons in the hypothalamus express Ptprd as an additional target of asprosin. Asprosin-deficient mice (those with Neonatal Progeroid syndrome genetic mutation) and mice with genetic Ptprd loss in oxytocin neurons exhibit hypotension.

Asprosin-Ptprd signaling is a common thread in the development of key MS components: T2DM, obesity induced by overnutrition, and hypertension. We report that treatment with 7-BIA (7-butoxy illudalic acid analog), a small molecule Ptprd antagonist, has marginal effects on glucose homeostasis, but significantly reduces appetite and blood pressure in mice. Our results show that 7-BIA has the potential to serve as a unified treatment approach for three key elements of MS: obesity, T2DM, and hypertension, providing a promising "one remedy for three maladies."

Supported by: OCVD COBRE Pilot grant (P30 GM127211) and DRC Extended Pilot and Feasibility Award.  
College of Arts & Sciences Summer 2024 Undergraduate Research Award

Primary Presenter / email: **Voisard, Layne** / lrvo223@uky.edu  
**Undergraduate Student**  
**Translational Research/Science**  
**Cardiovascular**

**Presentation 229**

Abstract Title: **Investigating Isometric Force Production of Cardiac Tissue Through Multicellular Muscle Mechanics**

Author(s): E. L. Wilkerson, Department of Internal Medicine, U of Kentucky; A. T. Minton, Departments of Physiology and Internal Medicine, U of Kentucky; K. S. Campbell, Departments of Physiology and Internal Medicine, U of Kentucky

**Abstract:** The heart's systolic contraction and diastolic relaxation depend on tightly coordinated calcium signaling and actomyosin cross-bridge cycling. Dysregulation of these processes underlies various cardiac pathologies originating from cellular and subcellular aberrations. Muscle mechanics experiments have been instrumental in unraveling the molecular mechanisms governing the heart's biophysical function.

The Campbell Muscle Lab uses muscle mechanics to elucidate the contractile properties of myocardium in their cardiac biobank. This technique involves anchoring triton-permeabilized muscle fibers (<1,000 microns in length) between a force transducer and length controller. The apparatuses are attached to a temperature-controlled stage with multiple bathing solution of calcium concentrations (pCa). SLControl, an in-house data acquisition system, enables real-time measurements and can execute step-length change protocols with force trace analysis in seconds. Force values can be plotted to visualize the force-pCa sigmoid relationship, providing key metrics for maximum force production, calcium sensitivity, and myofilament cooperativity.

Data from muscle mechanics studies have informed the development of therapeutic strategies and refined diagnostic frameworks for heart disease. Ongoing research continues to strengthen the connection between bench science and clinical applications, underscoring the critical role of muscle mechanics in advancing cardiovascular medicine.

Supported by: NIH award: R01HL149164

Primary Presenter / email: **Wilkerson, Elizabeth** / elwi244@uky.edu  
**Undergraduate Student**  
**Translational Research/Science**  
**Cardiovascular**



**Presentation 230**

Abstract Title: **Characteristic Histopathological Patterns in Diverse Cardiomyopathies: Insights from a 600-Patient Biobank**

Author(s): O. Kelly, Department of Physiology, U of Kentucky, Division of Cardiovascular Medicine, U of Kentucky; N. Daneshgar, Department of Physiology, U of Kentucky; Division of Cardiovascular Medicine, U of Kentucky; K. S. Campbell, Department of Physiology, U of Kentucky; Division of Cardiovascular Medicine, U of Kentucky

**Abstract:** This study establishes a comprehensive, open-access repository of high-resolution, digitized cardiac tissue slides from over 600 patients encompassing a diverse spectrum of myocardial diseases—including ischemic and non-ischemic cardiomyopathies, viral cardiomyopathy, peripartum cardiomyopathy, and dilated cardiomyopathy. The left ventricular tissues are processed through cryosectioning, fixation, embedding, sectioning, and mounting, then stained using a range of techniques: hematoxylin-eosin for cellular morphology, Picrosirius Red for fibrosis, and lipofuscin stains for pigment accumulation linked to aging or injury.

Utilizing whole-slide imaging on the Zeiss Axioscan Z1 system, we acquire high-resolution digital images that are rigorously paired with extensive metadata—including clinical parameters, genetic profiles, and patient outcomes—to create a standardized, searchable resource. This integrated repository not only enables detailed correlation between histopathological findings (e.g., fibrosis, myocyte degeneration, and inflammatory infiltrates) and clinical trajectories but also serves as a robust platform for advanced analytics including artificial intelligence applications. Preliminary analyses have revealed distinct histological patterns associated with disease progression, providing critical insights into the pathophysiology of cardiomyopathies. Moreover, the resource lays the groundwork for leveraging machine learning and other data-driven approaches to identify novel diagnostic markers and therapeutic targets.

By bridging traditional histopathology with modern digital and clinical data integration, this initiative accelerates translational research and supports the development of precision medicine strategies aimed at improving diagnosis, prognosis, and treatment outcomes in myocardial disease.

Supported by: NIH award: R01HL163977; NIH award: R01HL173989

Primary Presenter / email: **Kelly, Olivia** / omke224@uky.edu  
**Undergraduate Student**  
**Translational Research/Science**  
**Cardiovascular**

**Presentation 231**

**Abstract Title: Post-ICU Vulnerability: How Age and Living Alone Influence Quality of Life**

**Author(s):** K. Bianchini; A. Fox; F. González-Seguel; Department of Physical Therapy, U of Kentucky; L. Summers, Department of Internal Medicine, U of Kentucky; A. Montgomery-Yates, Department of Internal Medicine, U of Kentucky; A. G. Kalema, Department of Internal Medicine, U of Kentucky; E. Dupont-Versteegden, Department of Physical Therapy, U of Kentucky; L. Fresenko; K. P. Mayer, Department of Physical Therapy, U of Kentucky.

**Abstract:** Background: Survivors of critical illness are at risk of symptoms and impairments collectively known as post-intensive care syndrome. There is a dearth of evidence examining how patient-and social factors influence outcomes after hospital discharge. The purpose of this study is to examine how age and living arrangement influence quality of life.

Methods: We performed a prospective, interim analysis of TRACER (NIH-R01) with detailed methodology previously disseminated (NCT05537298). Adults over 18 years old, who were admitted for acute respiratory failure or sepsis at UK and attended ICU Recovery Clinic, were enrolled. Patients participated in a battery of tests for physical, cognitive, and mental health at hospital discharge, 3-, 6-, and 12-months following discharge. This sub-analysis examines social determinants of health, social needs, and quality of life reported between 3 and 6-months post-discharge. Patients were grouped based on living situation and activities of daily living (ADL) autonomy. Mann-Whitney U tests were utilized with p-value=0.10 due to exploratory approach.

Results: Forty-two adults with median age of 58 (IQR 46-64), with 43% of whom female were included. Patients living alone (n=14) are more likely to report issues paying bills and have a higher number of unmet needs compared to patients reporting living with others (n=28, t=2.0, p=0.04). Adults reporting not needing help with ADLs, were younger (p= 0.06) and had higher quality of life (p=0.131).

Conclusions: Our preliminary analysis suggests that patient- and social-factors influence quality of life. The study highlights the need to evaluate and address unmet social needs during ICU recovery.

Supported by: The work is supported by the NIH R01AR081002 and K23AR079583.

Primary Presenter / email: **Bianchini, Katie** / kebi231@uky.edu  
**Undergraduate Student**  
**Clinical Research**  
**Pulmonary**

**Presentation 232**

Abstract Title: **Spatially Explicit Contraction Model Predicts That Filament Compliance Affects Time Course of Relaxation**

Author(s): H. Laney, U of Kentucky; U. Gulbulak, Division of Cardiovascular Medicine, U of Kentucky; K. S. Campbell, Division of Cardiovascular Medicine, U of Kentucky

**Abstract:** Muscle preparations, either activated by increased Ca<sup>2+</sup> concentration or external stimuli, have been shown to relax in two different phases in previous experiments. The steady state force first drops linearly and then suddenly in an exponential form. Previous experiments showed that the number of attached cross-bridges decreases faster than the rate at which developed force drops. This delay is associated with the increased strain in each bound head as a consequence of extensible filaments and strain dependent detachment kinetics. To study mechanisms underlying this behavior, we used FiberSim mimicking similar experimental protocols. FiberSim is spatially explicit model of a half-sarcomere that tracks the location and status of each contractile protein in a myofilament lattice with compliant filaments. In the model, the detachment rate of bound heads depended on the load and increased as the heads were pushed in the direction of shortening, representing the experimental data obtained from single myosin optical trapping. The biphasic relaxation behavior was captured by the combination of extensible filaments and the strain dependent detachment function. In the simulations, the filaments extended around 0.5%, which is comparable to those measured in the previous experiments. Although biphasic behavior was captured in silico using a compliant series element, these results suggest that biphasic relaxation could be an intrinsic behavior of half-sarcomeres, not solely the compound effects of series compliance in preparations.

Supported by: NIH award: R01HL146676

Primary Presenter / email: **Laney, Hannah** / hela228@uky.edu  
**Undergraduate Student**  
**Basic Research**  
**Cardiovascular**

Presentation 233

Abstract Title: **Epinephrine Increases the Occurrence of Arrhythmia Under Low-Glucose Conditions in Isolated Rat Hearts**

Author(s): L. A. Schoeder, Department of Internal Medicine (IM) - Endocrinology, U of Kentucky;  
A. M. Johnson, IM - Endocrinology, U of Kentucky;  
S. Velmurugan, IM - Endocrinology, U of Kentucky;  
S. J. Fisher, IM - Endocrinology, U of Kentucky

**Abstract:** Severe hypoglycemia accounts for up to 10% of deaths in individuals with insulin-treated Type 1 diabetes. Previous research in the Fisher lab has demonstrated that severe hypoglycemia induces fatal cardiac arrhythmias. The counterregulatory response to hypoglycemia triggers a marked increase in epinephrine levels that may contribute to these fatal arrhythmias. We wished to test the hypothesis that the arrhythmias associated with severe hypoglycemia result from elevated epinephrine levels rather than reduced glucose availability. To test this hypothesis, we utilized an isolated heart model. Briefly, hearts were extracted from 10 week-old Sprague-Dawley male rats. Aortas were cannulated and retrograde-perfused with Krebs-Henseleit (KHB) buffer containing glucose concentrations of 5, 2.5, 0.5, and 0.1 mM, with or without epinephrine (1  $\mu$ M) using a Langendorff perfusion system. Electrodes positioned in the heart recorded ECG data, allowing us to analyze heart rate, isolated arrhythmic events, and the duration of arrhythmic episodes. Low-glucose (0.5 or 0.1 mM) alone did not significantly increase arrhythmic duration compared to normal glucose levels (5 mM glucose). However, the presence of epinephrine (1  $\mu$ M) significantly prolonged arrhythmia duration under low-glucose (0.1 mM) conditions compared to control (5 mM glucose). These results suggest that severe hypoglycemia-induced cardiac arrhythmias may be mediated by synergistic effects of elevated epinephrine levels and low blood glucose.

Supported by: NIDDK R01DK118082 and 1R25DK109894 to S.J.F, Advancing Research Collaborations Award 2024 (SV), Summer Research Fellowship Program for Diabetes and Obesity Research 2024 (LS) Barnstable Brown Diabetes Center and Diabetes and Obesity Research Priority Area

Primary Presenter / email: **Schoeder, Lily** / lasc240@uky.edu  
**Undergraduate Student**  
**Basic Research**  
**Other**

Presentation 234

Abstract Title: **Programmable Scanning Diffuse Speckle Contrast Imaging (PS-DSCI) of Cerebral Blood Flow**

Author(s): F. Akbari, Department of Biomedical Engineering, U of Kentucky; F. Hamedi, Department of Biomedical Engineering, U of Kentucky; L. Chen, Department of Neurosurgery, School of Medicine, U of Kentucky; G. Yu, Department of Biomedical Engineering, U of Kentucky

**Abstract:** Background: Imaging cerebral blood flow (CBF) is crucial for diagnosing and managing cerebrovascular diseases. Speckle contrast diffuse correlation tomography (scDCT) utilizes near-infrared point-scanning illumination and a 2D camera for high-density CBF imaging at different depths. However, point-scanning is time-consuming, which restricts its practical applications.

Methods: We have developed a programmable scanning diffuse speckle contrast imaging (PS-DSCI) technology that employs a digital micromirror device to rapidly scan line-shape coherent light at 785 nm on tissue surface and a synchronized 2D camera to remotely capture images from tissue boundary. A novel data processing pipeline was developed for depth-sensitive 2D mapping of CBF distributions. The PS-DSCI system was evaluated for CBF imaging in head-simulating phantoms and in adult mice during 8%CO<sub>2</sub> inhalation and transient carotid arterial ligations.

Results: Using a camera at the frame rate of 35 Hz, the sampling rate of a CBF image increases from 0.05 Hz (25x25 point sources in scDCT) to 0.7 Hz (25 vertical + 25 horizontal scanning lines in PS-DSCI), achieving ~14-fold improvement. Experiments on head-simulating phantoms with different top layer thicknesses verified that PS-DSCI enables 2D mapping of flow distributions at different depths. In-vivo experiments showed PS-DSCI's capability to capture temporal and spatial variations in CBF during pathophysiological manipulations.

Conclusions: The fast line-scanning in PS-DSCI significantly increases the sampling rate and reduces the number of raw intensity images required for CBF reconstruction, thus leading to reduced computation time and data storage. High spatiotemporal resolution enables capturing fast hemodynamic changes across different brain regions.

Supported by: We acknowledge partial financial support from the National Institutes of Health (NIH) #R01 EB028792, #R01 HD101508, #R21 HD091118, #R21 NS114771, #R41 NS122722, #R42 MH135825, #R56 NS117587 (G. Y.), the Halcomb Fellowship in Medicine and Engineering at the University of Kentucky (F. A.), and the Neuroscience Research Priority Area (NRPA) Pilot Grant from the University of Kentucky (L. C.). The content is solely the responsibility of the authors and does not necessarily represent the official views of NIH, NRPA, or University of Kentucky.

Primary Presenter / email: **Akbari, Faezeh** / faezeh.akbari@uky.edu  
**Graduate Student**  
**Translational Research/Science**  
**Cardiovascular**

Presentation 235

Abstract Title: **Noninvasive Optical Imaging of Cerebral Blood Flow (CBF) Response to Intracranial Pressure (ICP) Elevation**

Author(s): F. Fathi, Department of Biomedical Engineering, U of Kentucky; P. Zhang, Department of Biomedical Engineering, U of Kentucky; M. Mohtasebi, Department of Biomedical Engineering, U of Kentucky; F. Akbari, Department of Biomedical Engineering, U of Kentucky; S. Rabienia Haratbar, Department of Biomedical Engineering, U of Kentucky; D. Singh, Department of Biomedical Engineering, U of Kentucky

**Abstract:** Background: Intracranial pressure (ICP) elevation, a hallmark of neurological conditions (e.g., traumatic brain injury, cerebral hemorrhage), disrupts cerebral autoregulation (CA) and negatively impacts cerebral blood flow (CBF) and its pulsatile waveform. This study optimized a noncontact, portable, time-resolved laser speckle contrast imaging (TR-LSCI) technique for fast, high-density mapping of pulsatile CBF at different depths of the rat head.

Methods: The TR-LSCI system synchronizes a picosecond-pulsed, widefield laser source with a high-resolution (512x512 pixels), picosecond-gated SPAD512<sup>2</sup> camera (Pi Imaging Technology) to capture depth-resolved CBF maps. ICP was modulated by incremental saline infusion into the right lateral ventricle using syringe pump at stepwise incremental rates from 0.05 to 1.0 ml/min. A solid-state sensor and a fiber optic sensor were used to continuously monitor ICP and arterial blood pressure (ABP), respectively. The system's performance was evaluated in phantoms and in vivo rat models.

Results: TR-LSCI enabled depth-resolved CBF mapping at a 52 Hz sampling rate, capturing pulsatile waves. Incremental saline injections elevated ICP, while ABP and CBF remained relatively stable at low injection rates. However, at higher injection rates, CBF increased as ABP overcompensated for the elevated ICP, indicating a loss of CA.

Conclusions: TR-LSCI enables high-spatiotemporal-resolution imaging of pulsatile CBF dynamics, offering the potential to predict ICP variations noninvasively. Simultaneous measurements of CBF, ICP, and ABP allow for the investigation of CA mechanisms. Future studies will translate TR-LSCI into clinical practice for cerebral monitoring of neonatal brain development.

Supported by: National Institutes of Health (NIH) #R01 EB028792, #R01-HD101508, #R21-HD091118, #R21-NS114771, #R41-NS122722, #R42-MH135825, #R56-NS117587 (G.Y.) and the Halcomb Fellowship in Medicine and Engineering at the University of Kentucky (F.F.). Swiss National Science Foundation (grants 20QT21\_187716 Qu3D "Quantum 3D Imaging at high speed and high resolution" and 200021\_166289).

Primary Presenter / email: **Fathi, Faraneh** / faraneh.fathi@uky.edu  
**Graduate Student**  
**Clinical Research**  
**Neuroscience**

Presentation 236

Abstract Title: **Continuous Monitoring of Cerebral Blood Flow and Oxygenation Responses to Intermittent Hypoxia in Neonatal Rats**

Author(s): P. Safavi, Department of Biomedical Engineering, U of Kentucky; Ch. A. Haque, Department of Biomedical Engineering, U of Kentucky; Ch. Yeo, Department of Biomedical Engineering, U of Kentucky; L. Chen, Department of Physiology, Spinal Cord and Brain Injury Research Center, U of Kentucky; G. Yu, Department of Biomedical Engineering, U of Kentucky, Lexington, Kentucky 40506, USA

**Abstract:** Background: Intermittent hypoxia (IH) may result in hypoxic/ischemic stresses on the brains of preterm neonates. To address the need for wearable techniques, we adapted an innovative, fiber-free, wearable diffuse speckle contrast flow-oximetry (DSCFO) device for continuous monitoring of both cerebral blood flow (CBF) and oxygenation in neonatal rats.

Methods: A miniaturized DSCFO probe was assembled consisting of two small laser diodes as focused-point and a tiny NanEye camera to detect spatial fluctuation of diffuse laser speckles for CBF, and light intensity attenuations for cerebral oxygenation measurements, including oxy- and deoxy-hemoglobin concentrations ([HbO<sub>2</sub>] and [Hb]). The DSCFO probe was attached gently to the head of neonatal rats (7 days old) under 1.25% isoflurane anesthesia. Neonatal rats in the IH group received repetitive transient hypoxia-hyperoxia challenges (10 cycles of 2-minute 8% O<sub>2</sub> in N<sub>2</sub> and 2-minute 100% O<sub>2</sub>), while the sham group underwent a 10-minute normoxic baseline monitoring.

Results: The IH group (n = 8) demonstrated significant increases in CBF ( $1.268\% \pm 0.767$ , p = 0.041) and [HbO<sub>2</sub>] ( $3.346\% \pm 1.946$ , p = 0.003), and a significant decrease in [Hb] ( $0.98\% \pm 2.340$ , p = 0.018) during the last 2 minutes of recovery. In contrast, the sham group (n = 6) exhibited minor variations in CBF, HbO<sub>2</sub>, and Hb over the monitoring period.

Conclusions: This study demonstrated the feasibility of DSCFO as a low-cost wearable sensor for continuous monitoring of multiple cerebral hemodynamic parameters. The findings underscore the importance of multi-parameter measurements for gaining deeper insights into cerebral regulation during IH events.

Supported by: NIH/NINDS R56 NS117587

Primary Presenter / email: **Safavi, Pegah** / [pegah.Safavi@uky.edu](mailto:pegah.Safavi@uky.edu)  
**Graduate Student**  
**Other**  
**Pediatrics**

Presentation 237

Abstract Title: **Validation of a Wearable Sensor-Based Device for Objective Characterization of Hand Function**

Author(s): M. Bates, Department of Biomedical Engineering, U of Kentucky; M. Pelfrey, Department of Biomedical Engineering, U of Kentucky; A. C. Glueck, Department of Neurology, U of Kentucky; S. Sunderam, Department of Biomedical Engineering, U of Kentucky.

**Abstract:** Strokes are a leading cause of lifelong disabilities, particularly upper extremity impairments that affect hand function. Clinical assessments often rely on subjective evaluations, highlighting the need for objective tools to quantify impairment and track recovery. Our wearable sensor-based device (WSBD) measures individual finger movements and applied fingertip force using flex sensors and force-sensitive resistors (FSRs). With IRB approval, we recruited 30 individuals (mean age:  $25.8 \pm 4.6$  years) with no reported hand impairments to evaluate the WSBD's ability to track hand function. Participants performed graded extension, contraction, and force application tasks with four target levels while receiving real-time feedback through a graphical user interface (GUI). Findings showed significant differences ( $p < 0.05$ ) in movement and applied force between all target levels. Flex sensor outputs strongly correlated ( $|r| > 0.7$ ) with motion capture data, and FSR outputs correlated with load cell measurements. Mean absolute relative errors were  $<5\%$  for flex sensors and  $<30\%$  for force sensors. Additionally, a preliminary study ( $n=4$ ) tested the WSBD's ability to characterize activities of daily living (ADLs), including grasping, twisting, and pulling tasks. Return maps, radar charts, and dynamic time warping representations revealed distinct movement patterns, suggesting that the WSBD can differentiate real-world tasks and demonstrate strong potential for tracking hand function. Future work will focus on evaluating its feasibility as a functional assessment tool in stroke rehabilitation and expanding the healthy cohort to solidify findings.

Supported by: NSF award: No. 1849213 and the Halcomb Fellowship in Medicine and Engineering (to Madison Bates).

Primary Presenter / email: **Bates, Madison** / mlba283@uky.edu  
**Graduate Student**  
**Translational Research/Science**  
**Stroke**



**Presentation 238**

**Abstract Title: Noncontact diffuse optical imaging of blood flow and oxygenation distributions in reconstructive skin flaps of rats**

**Author(s):** S. Rabienia Haratbar, F. Hamed, F. Akbari, F. Fathi, M. Mohtasebi, D. Singh, X. Liu, and G. Yu, F. Joseph Halcomb III, M. D. Department of Biomedical Engineering, U of Kentucky; L. Chen, Biostatistics and Bioinformatics Shared Resource Facility, Markey Cancer Center, U of Kentucky; L. Wong, Division of Plastic Surgery, U of Kentucky; L. Chen, Department of Neurosurgery, U of Kentucky; Y. Shang, State Key Laboratory of Dynamic Measurement Technology, North University of China, Taiyuan, China

**Abstract:** Background: Mastectomy is performed on half of women diagnosed with breast cancer. The main complication following mastectomy and breast reconstruction is mastectomy skin flap necrosis (MSFN), caused by insufficient blood flow and oxygenation. Intraoperative imaging of skin flap blood flow and oxygenation provides objective information for assessing ischemic-hypoxic tissues that are associated with post-surgery necrosis.

Methods: We have developed an innovative multi-wavelength speckle contrast diffuse correlation tomography (MW-scDCT) system for noncontact imaging of deep tissue blood flow and oxygenation. MW-scDCT was first evaluated on the tissue phantom and human forearm during artery cuff occlusion. Then it was used for longitudinal imaging of 7 rats with full necrotic, implant, half necrotic, and sham skin flaps over 7 days post-surgery.

Results: The MW-scDCT enabled imaging of Intralipid particle flow contrasts in the tissue phantom at different depths and detected significant variations in forearm blood flow and oxygenation during artery cuff occlusion. In rat flaps with full necrosis, blood flow and oxy-hemoglobin concentration decreased while deoxy-hemoglobin concentration increased over 7 days, demonstrating the sensitivity of MW-scDCT in detecting severe tissue ischemia and hypoxia.

Conclusions: Intraoperative fluorescence angiography has been used for detecting MSFN but faces clinical limits due to allergic reactions, short time-window for observation, and high cost for equipment and supplies. The inexpensive dye-free MW-scDCT enables noninvasive and longitudinal imaging of blood flow and oxygenation distributions in skin flaps of rats. We are currently testing MW-scDCT for intraoperative imaging of human mastectomy skin flaps in the clinic for predicting and preventing MSFN.

Supported by: R01-HD101508; R01-EB028792; R21-HD091118; R21-NS114771

Primary Presenter / email: **Rabienia Haratbar, Samaneh** / sra251@uky.edu  
**Graduate Student**  
**Surgery**

**Presentation 239**

Abstract Title: **Building Block-Based 3D Hydrogel Scaffolds with Multi-Scale Porosity for Tissue Regeneration**

Author(s): J. H. Patel, Department of Biomedical Engineering, U of Kentucky; N. Su, Department of Biomedical Engineering, U of Kentucky

**Abstract:** Porosity is a critical property of hydrogel materials to treat tissue injury, where macropores facilitate cell infiltration and tissue ingrowth, while micropores provide a defined 3D niche for modulating cell functionality. However, hydrogel materials with controllable pore sizes at both the macro- and micro-scale remain underdeveloped. To address this challenge, we designed a microfluidic device and demonstrated its ability to generate microgels in various shapes, including particles, rods, and fibers. These LEGO-like microgel building blocks can be packed and photo-crosslinked to form macro-porous scaffolds with well-defined architecture. The results demonstrated that microgel particle size can be tuned by adjusting the flow rate of the carrier and hydrogel solutions. Each condition produced uniformly sized particles, ensuring controlled macroporosity. Additionally, by incorporating dimethyl sulfoxide into the gelatin solution and cryo-treatment, we further induced micropores within individual microgel particles at varying sizes. When mesenchymal stem cells (MSCs) were seeded onto the microgels that have undergone cryo-treatment, the microgels developed microporosities which supported cell viability. Our ongoing studies focus on evaluating the impact of macro- and micropore structures on stem cell differentiation, macrophage immune modulation, and their potential application in promoting bone regeneration. We envision that this modular microgel platform, with tunable macro- and microporosity, will serve as a versatile biomaterial platform for treating a wide range of tissue-based injuries.

Supported by: Biomedical Engineering Startup Funds

Primary Presenter / email: **Patel, Jay** / [jhpa239@uky.edu](mailto:jhpa239@uky.edu)  
**Graduate Student**  
**Translational Research/Science**  
**Surgery**

Presentation 240

Abstract Title: **Intraoperative Optical Imaging of Tissue Hemodynamic Variations in Mastectomy Skin Flaps for Identifying Ischemic Tissue**

Author(s): F.Hamedi, Department of Biomedical Engineering, U of Kentucky; S. Rabienia Haratbar, Department of Biomedical Engineering, U of Kentucky; F.Akbari, Department of Biomedical Engineering, U of Kentucky; E. B. Lynch, Division of Plastic Surgery, U of Kentucky; L.Chen, Neurosurgery, School of Medicine, U of Kentucky; L.Wong, Division of Plastic Surgery, U of Kentucky; G.Yu, Department of Biomedical Engineering, U of Kentucky

**Abstract:** Background: Mastectomy skin flap necrosis (MSFN) occurs in 5-30% of breast reconstruction cases due to insufficient tissue perfusion. Intraoperative fluorescence angiography (SPY-PHI) has been used for predicting MSFN. However, several issues limit its wide acceptance, including allergic reaction, short time-window for observation, and high cost for equipment and supplies. We report an innovative, inexpensive, dye-free, and depth-sensitive multiple wavelength speckle contrast diffuse correlation tomography (MW-scDCT) that enables noncontact imaging of tissue hemodynamic variations during surgery. Methods: Six patients undergoing mastectomies were imaged sequentially by the SPY-PHI and MW-scDCT. The MW-scDCT scans laser point sources at 690 nm and 830 nm alternatively and uses a CMOS camera to capture intensity images at multiple source positions. Tissue blood flow maps were reconstructed by quantifying diffuse laser speckle contrasts while tissue blood oxygenation maps were reconstructed by quantifying light intensity reductions at two wavelengths. Results: The hemodynamic images obtained by the MW-scDCT and SPY-PHI in 6 patients were generally consistent. Particularly, an ischemic skin flap in one patient (P6) was detected by both SPY-PHI and MW-scDCT during surgery, indicating the risk of post-surgery necrosis. As a result, the implant was not performed in P6. Conclusions: The MW-scDCT offers a groundbreaking noninvasive imaging method that simultaneously measures blood flow and oxygenation, enabling the identification of ischemic or hypoxic tissues during surgery. With broader adoption and more patient data, MW-scDCT has the potential to become a cost-effective and noninvasive tool for intraoperative evaluation of skin flap viability, aiding in the prediction and prevention of MSFN.

Supported by: NIH/NIBIB R01 EB028792-01

Primary Presenter / email: **Hamedi, Fatemeh** / fha251@uky.edu  
**Graduate Student**  
**Clinical Research**  
**Surgery**

Presentation 241

Abstract Title: **Design and Development of a Wireless Wearable Fluorescence Imaging Device for Intraoperative Brain Tumor Identification**

Author(s): C. A. Haque, Department of Biomedical Engineering, U of Kentucky; Y. Yuan, Bioptics Technology LLC, Lexington, KY; M. Mohtasebi, Bioptics Technology LLC, Lexington, KY; Y. Gu, Juke Audio, Manhattan Beach, CA; J. Sun, Bioptics Technology LLC, Lexington, KY; T. Pittman, Department of Neurosurgery, U of Kentucky; G. Yu, Department of Biomedical Engineering, U of Kentucky

**Abstract:** Background. Intraoperative identification of malignant gliomas (MGs) is challenging due to difficulty in distinguishing tumor from normal tissue. Fluorescence imaging offers real-time visualization but relies on costly, inflexible clinical microscopes operated by skilled professionals. To address these limitations, we developed a wearable fluorescence eye loupe (FLoupe™-3) for intraoperative MG detection, integrating miniaturized components into surgical loupes with wireless control and real-time video streaming. Methods. The FLoupe™-3 prototype incorporates white and blue LEDs with optimal intensities and emission filters for balanced fluorescence visualization. A Raspberry Pi Camera Module 3 enables remote recording and tumor fluorescence display. A custom graphical user interface (GUI) facilitates wireless control via local Wi-Fi on the Raspberry Pi board. FLoupe™-3 also includes a custom circuit board and a wireless foot pedal for hands-free operation. The circuit board manages LED driving and foot pedal receiver circuits, powered by a rechargeable battery. LED intensity and on/off functionality are adjustable via the GUI and foot pedal. Results. The FLoupe™-3 visualizes intensity and illumination at a 24-inch working distance, preferred by surgeons. Real-time video streaming has under 1 second of latency. Users can stream video, adjust camera parameters such as exposure time, resolution, frame rate. The intensities of the two LEDs can be controlled by the control panel in the GUI. Conclusions. The FLoupe™-3 prototype overcomes the limitations of existing clinical microscopes by integrating miniaturized, wirelessly controlled components into surgical loupes, providing a user-friendly, wireless, wearable fluorescence imaging solution for intraoperative tumor identification and resection guidance.

Supported by: This work was supported in part by the National Institutes of Health (NIH) Small Business Technology Transfer (STTR) Program under Grant R41CA243600 and Grant R42CA243600 and in part by the Kentucky Innovation Matching Fund Award Program.

Primary Presenter / email: **Haque, Chowdhury Azimul** / ca.haque@uky.edu  
**Graduate Student**  
**Translational Research/Science**  
**Surgery**

**Presentation 242**

Abstract Title: **Comparing Cannabis Use Questions in National Surveys by Compiling Cannabis Use Repository**

Author(s): S. Ciaverelli, College of Public Health, U of Kentucky; S. Goodin, College of Public Health, U of Kentucky; K. E. Dunn, Department of Health, Behavior & Society, U of Kentucky; A. E. Ray, Department of Health, Behavior & Society, U of Kentucky.

**Abstract:** Objective/ Background: The aim of this study was to create a repository of cannabis use measures from national epidemiological surveys, identify key characteristics of the measures, and organize the repository by characteristics. Compiling measures into a single, user-friendly repository can make it easier for individuals who are interested in future cannabis-related measurement and/or use of survey results (e.g., students, researchers, local public health officials) to find the information they need.

Methods: Cannabis-specific measures were collected from 5 national surveys and put into a database. Three members of the research team reviewed the database to identify measure characteristics. Once key domains and subdomains were agreed upon, items were individually coded by each team member. The team met to discuss and reconcile any coding discrepancies.

Results: Measures were organized within two primary domains: time and content. For time, four subdomains were identified: Most Recent, Past Month, Past Year, and Lifetime Use. For behavior, seven subdomains were identified: Any Use, Age of Onset, Frequency, Quantity, Mode of Consumption, Context (Who, How, Where), and Other Cannabis-related Behaviors. Past Month was the most commonly measured timeframe (4 out of 5 surveys). Frequency was the most commonly covered content area (4 out of 5 surveys).

Conclusion: As an undergraduate student, the experience of compiling a measures repository helped us to gain research experience including: searching for information; entering data; and qualitative data analysis. Our next step will be to document details related to accessibility of data from these surveys.

Supported by:

Primary Presenter / email: **Ciaverelli, Sophie** / [Seci223@uky.edu](mailto:Seci223@uky.edu)  
**Undergraduate Student**  
**Behavioral Research**

**Presentation 243**

Abstract Title: **NPCS mission to make safety culture in the child welfare system.**

Author(s): E. Riley, Department of Health Management and Policy, U of Kentucky and S. Dickens, College of Public Health, U of Kentucky

**Abstract:** Public child welfare system workers dedicate their time and hard work to improve the outcomes for children and their families. As a high-stake organization, there are possibilities for individuals to make mistakes that could range from minor missed case opportunities to critical incidents cases that push policy change. The National Partnership for Child Safety (NPCS) is a peer-to-peer learning and data sharing collaborative of over 35 child welfare jurisdictions in the United States, and members are focused on systems improvements. One goal the NPCS wants to achieve is to develop an efficient model of a safety culture to be followed for overall psychological safety. With a focus of critical incidents, the NPCS developed a safe systems improvement tool aimed to understand possible influences in case errors. The main objective of this study is to find a correlation between stress and work outcomes using employees within the NPCS jurisdiction as a sample. The methods of this study include surveys of child welfare workers reflecting on their critical incidents. Ultimately, the goal is to understand the different types of external stressors that impact child welfare workers and their target families. Currently, this study is through data analyzation; thus, conclusions are being developed. A full description of the database, study goals, and preliminary data will be presented at the showcase.

Supported by:

Primary Presenter / email: **Dickens, Sara** / sara.dickens@uky.edu  
**Undergraduate Student**  
**Basic Research**

**Presentation 244**

Abstract Title: **Comparing Alcohol Use Questions in National Surveys Through Compiling an Alcohol Use Repository**

Author(s): S. Goodin, College of Public Health, U of Kentucky; S. Ciaverelli, College of Public Health, U of Kentucky; K. E. Dunn, Department of Health, Behavior & Society, U of Kentucky; A. E. Ray, Department of Health, Behavior & Society, U of Kentucky

**Abstract:** Purpose: The aim of this study was to create a repository of alcohol use measures from national epidemiologic surveys, identify key characteristics of the measures, and organize the repository by characteristics. Compiling measures into a single, easy-to-use repository can make it easier for individuals who are interested in future alcohol-related measurement and/or use of survey results (e.g., students, researchers, local public health officials) to find the information they need. Methods: Alcohol-specific measures were collected from 5 national surveys and put into a database. Three members of the research team reviewed the database to identify measure characteristics. Once key domains and subdomains were agreed upon, items were individually coded by each team member. The team met to discuss and reconcile any coding discrepancies. Results: Measures were organized within two primary domains: time and behavior. For time, four subdomains were identified: most recent, past month, past year, and lifetime use. For behavior, eight subdomains were identified: any use, age of onset, frequency, quantity, peak drinking, heavy drinking, drinking context, and other drinking-related behaviors. The past month was the most measured timeframe (4 out of 5 surveys). Frequency of use and other drinking-related behaviors were the most covered area (4 out of 5 surveys). Conclusion: As an undergraduate student, the experience of compiling a measures repository helped us to gain research experience including searching for information, entering data, and qualitative data analysis. Our next step will be to document details related to the accessibility of data from these surveys.

Supported by:

Primary Presenter / email: **Goodin, Sophia** / slgo230@uky.edu  
**Undergraduate Student**  
**Behavior**

**Presentation 245**

Abstract Title: **Exploring Changing Infant Health Outcomes in Kentucky**

Author(s): E. G. Hague, Department of Health Management and Policy, U of Kentucky; R. Hogg-Graham, Department of Health Management and Policy, U of Kentucky; E. Clear, Department of Health Management and Policy, U of Kentucky; J. Bush, Kentucky Injury Prevention and Research Center, U of Kentucky.

**Abstract:** Infant mortality and the prevalence of negative infant health outcomes are increasing for the first time in decades. This study examined changes in critical infant health outcomes in the state of Kentucky. We focused on the outcomes of infant mortality, pre-term birth, and low birthweight. County-level outcome data was sourced from the U.S. Health Resources and Services Administration (HRSA) and was compiled into rolling averages for two different time frames, 2017-2019 and 2020-2022. Analysis of this data found increases in infant mortality, pre-term births, and low birthweight across the state. To better understand these findings, additional analysis was completed to investigate outcome changes in varying community types. Counties were categorized as rural Appalachian, rural non-Appalachian, or urban according to the Appalachian Regional Commission (ARC) guidelines. Descriptive analysis of the data found that outcome changes varied depending on county designation. Specifically, the prevalence of preterm birth, low birthweight, and infant mortality was determined to be increasing the most in rural non-Appalachian counties. These results highlight the concerning trend of worsening infant health outcomes in Kentucky and make clear the need for further research in this field to determine the underlying cause of this phenomenon and possible interventions that could address the issue.

Supported by:

Primary Presenter / email: **Hague, Emma Frace** / egha240@uky.edu  
**Undergraduate Student**  
**Community Research**



**Presentation 246**

Abstract Title: **Evaluation of an Artificial Intelligence Support Tool in a Psychiatric Residential Treatment Facility**

Author(s): C. Meyers, College of Public Health, U of Kentucky; M. McGladrey, Center for Innovation in Population Health, U of Kentucky; K. Ryan, Director of Special Projects, Gemma Services

**Abstract:** The use of Artificial Intelligence (AI) is increasing in our technology-driven society. Among its many applications, AI is being employed by child-serving agencies to develop predictive decision support tools. Despite uptake by child-serving agencies of tools like these and the potential for replicating biases inherent to AI-based tools, there is minimal research on their implementation practices. This study illustrates how personnel in different roles (e.g., case manager, therapists, front-line staff) in a Psychiatric Residential Treatment Facility use an AI-based decision support tool through a participatory evaluation method called Ripple Effects Mapping. Researchers organized focus groups including 31 of the facility's staff members in various roles, which yielded qualitative insights on how they are using the tool to track youth progress, communicate with parents and stakeholders, and match youth to specific staff members with relevant skillsets. Limitations of implementing this tool include staff training, particularly among newer members, and utilizing the tool daily as part of routine practice. This study demonstrates how child-serving agencies implement the tool, as opposed to solely describing the tool itself. Consequently, the study identified opportunities for improving the tool and new data elements to continue incorporating.

Supported by:

Primary Presenter / email: **Meyers, Carly** / ceme239@uky.edu  
**Undergraduate Student**  
**AI/Machine Learning/**  
**Bioinformatics**

**Presentation 247**

Abstract Title: **Identifying Barriers and Best Practices in Addressing Unmet Social Needs Influencing Health Outcomes**

Author(s): I. Schmitt; M. McGladrey; R. Hogg-Graham; E. Clear; H. Brillakis; C. Grunert; E. Hague; M. Taylor; B. Ward, Department of Health Management and Policy, U of Kentucky

**Abstract:** This qualitative research project includes template analysis of interview data from key staff in managed care organizations (MCOs) and community-based organizations (CBOs) in Kentucky, focusing on their partnership and referral practices. It aims to identify barriers and best practices in these approaches to better address unmet social needs. The study team used template analysis to code 43 interviews with key MCO and CBO staff members indicating how these partners collaboratively navigate social determinants of health on behalf of their shared clients. The findings demonstrate how partnerships, referral processes, and capacity affect the ways that MCOs and CBOs communicate to direct patients to local resources and community-based support. We conclude with recommendations for best practices in building MCO and CBO capacity for partnership and resource sharing.

Supported by: This research was supported by a grant from the Robert Wood Johnson Foundation as part of the Research in Transforming Health and Health Systems Program (Grant ID 77256). Research reported in this publication was also supported by the Kentucky Cabinet for Health and Family Services, Department for Medicaid Services, under Agreement C2517 titled "Medicaid Managed Care Organizational Strategies to Address Enrollee Unmet Social Needs." The content is solely the responsibility of the authors and does not necessarily represent the official views of the Cabinet for Health and Family Services, Department for Medicaid Services.

Primary Presenter / email: **Schmitt, Isabel** / [isabelschmitt@outlook.com](mailto:isabelschmitt@outlook.com)  
**Undergraduate Student**  
**Community Research**

**Presentation 248**

Abstract Title: **Barriers and Facilitators to Treatment Adherence: An Exploration of the Lived Experience of Patients with Heart Failure**

Author(s): W. B. Burrows, Departments of Biostatistics and Epidemiology & Environmental Health, U of Kentucky; C. Lauckner, Department of Behavioral Science, U of Kentucky; A. Kucharska-Newton, Department of Epidemiology, U of NC at Chapel Hill; M. E. Lacy, Department of Epidemiology & Environmental Health, U of Kentucky; E. Abner, Department of Epidemiology & Environmental Health, U of Kentucky; D. C. Moga, Department of Pharmacy Practice and Science, U of Kentucky; M. S. Duncan, Department of Biostatistics, U of Kentucky

**Abstract:** Background: Research suggests that only ~50% of patients with HF meet recommended medication adherence; rates of overall treatment adherence are even lower. Drivers of treatment nonadherence in this population remain poorly understood. This qualitative study aims to identify barriers and facilitators of treatment adherence among patients with HF.

Methods: We recruited 19 adult patients with a diagnosis of HF from 2 clinics in Kentucky to participate in interviews. A semi-structured interview guide was used to ask patients about experiences, habits, barriers, and facilitators to engaging in their HF treatment. Six patients participated in follow-up interviews to assess the study team's interpretation of their prior responses and to ask clarifying questions to ensure saliency of the findings.

Results: Patients (58%) identified physician communication as crucial to their experience, citing open dialog, honest explanations, and willingness to listen as key components. Many patients identified goal setting as critical to their treatment adherence. By setting small, obtainable goals with their medical team, patients described feelings of increased self-confidence and reported making positive lifestyle changes. Rising costs of medication, food, and other therapies were identified as barriers to adherence. Finally, patients (42%) discussed having significant fear regarding their HF diagnosis which began after a precipitating traumatic event, such as a hospitalization or heart attack, and persisted years later.

Conclusion: These qualitative findings suggest that patients are more likely to engage with their treatment plan when they have effective communication with their physician, set obtainable goals, and are able to afford both food and medication.

Supported by: UK Department of Behavioral Science pilot grant

Primary Presenter / email: **Burrows, William** / wbbu222@uky.edu  
**Graduate Student**  
**Basic Research**

Presentation **249**

Abstract Title: **The impact of caregiver's needs for re-entry among children in out-of-home care**

Author(s): H. K. Shin; O. Vsevolozhkaya; X. Tong; W. Turner; J. S. Lyons, College of Public Health, Center for Innovation in Population Health (IPH-C), U of Kentucky

**Abstract:** For children who have been in out-of-home care (OHC) and then reunited with their permanent caregivers, re-entry to OHC may negatively affect their permanent relationships, highlighting the need for better support for caregivers. To examine the relationship between caregivers' needs factors and the likelihood and timing of re-entry within one year after being reunified with their caregivers for children who have been in OHC. Our sample included children and adolescents (age 0-17 years) reunited with their permanent caregiver in the foster or residential care system from 2011-2021 (N=13,212) in a midwestern state assessed using the Child and Adolescent Needs and Strengths (CANS). Time to re-entry was defined as the period between a child's exit date from their first reunification, occurring from 2011 to 2021, and their subsequent return to care within 365 days. Caregiver's needs were dichotomized as "one or more needs" and "non-needs" groups based on six factors: behavioral, emotional, executive functioning, health, socioeconomic status, and social resources. Among 13,212 children reunited with their families, 2,588 (19.6%) re-entered foster care within a mean follow-up period of 10.53 months. The mean age at re-entry was 9.65 years ( $\pm$  5.69). Controlling for demographic factors, children with caregivers who have one or more behavioral needs face a re-entry rate that is 20% higher ( $P < 0.001$ ). In addition, children whose caregivers have health-related needs have a 16% higher re-entry rate ( $P < 0.01$ ), and those with caregivers facing socioeconomic instability show a 26% higher re-entry rate ( $P < 0.001$ ) compared to those without such needs. This study shows that the needs of each caregiver significantly influence the likelihood and timing of a child's return to care. It highlights the importance of addressing caregivers' unmet needs when developing interventions for children in OHC, those reuniting with their caregivers, and those re-entering the system within one year.

Supported by:

Primary Presenter / email: **Shin, Hye Eun** / hksh224@uky.edu  
**Graduate Student**  
**Basic Research**

**Presentation 250**

Abstract Title: **Resource Guides: Connecting Kentucky's Communities**

Author(s): M. G. Taylor, Department of Health Management and Policy, U of Kentucky; B. M. Ward, Department of Health Management and Policy, U of Kentucky; T. M. Ard, Center for Public Health Systems Research, U of Kentucky; M. L. McGladrey, Department of Health Management and Policy, U of Kentucky

**Abstract:** Background: Resources within communities often hold barriers regarding accessibility, knowledge of resources, and stigmatization. Many communities lack a comprehensive report of all major resources available within and around their county. The increase of knowledge within the individual can increase participation of these resources, and in turn can increase overall health outcomes in a specific area.

Objective: Create a list of comprehensive resources within each Kentucky County that can be distributed via pamphlet handout or website linkage. These resource guides have the ability to serve as a crucial connecting point between academia and local health departments.

Methods: Scan the internet/social media/contact community resources to get a holistic understanding of resources available. Resources are pulled from each county or if not applicable to a specific county, the nearest resource to that respective location. Within each resource guide, the following categories are included: behavioral health centers, domestic violence resources, food assistance, harm reduction/syringe program, health services, housing services, legal services, medication for opioid use disorder, meetings, naloxone location, social support services, support and treatment locators, and transportation services. Guides are updated periodically and by demand/when needed.

Results: Comprehensive guides covering just under 80% of Kentucky counties have been developed and are undergoing review for distribution. In counties lacking local resources, guides incorporate the nearest available services to address community needs. Full completion is projected by summer 2025.

Supported by:

Primary Presenter / email: **Taylor, Mason** / mgta229@uky.edu  
**Graduate Student**  
**Community Research**

**Presentation 251**

Abstract Title: **Comparative Analysis of Obesity Prevalence Among U.S. Latinos by Health Insurance Status**

Author(s): M. Valenzuela, College of Public Health, U of Kentucky; K. McWhorter, College of Public Health, U of Kentucky

**Abstract:** Introduction: Obesity prevalence in the U.S. has tripled over the last 50 years and remains a public health concern. Among Latinos, 45.6% have obesity and represent the racial/ethnic group most likely to have no health insurance coverage. Uninsured individuals are less likely to access preventive care and are at greater risk for poor health outcomes. This study aims to investigate the association between health insurance status and BMI among Latinos living in the U.S.

Methods: We used the 2023 National Health Interview Survey (NHIS) public use data (N=29,522). The NHIS collects health information about adults across the U.S. through confidential, face-to-face interviews. Our sample included respondents who self-reported as Latino. Descriptive statistics were used to characterize the population using SAS version 9.4.

Results: There were 4,417 (14.9%) respondents who self-reported as Latino. Average age was 45.4+/-17.4 years, 54.8% female, 35.9% were obese, 83.3% reported having health insurance, 82% self-reported a "Good to Excellent" health status, and 25.7% self-reported as non-U.S. citizens. Among Latinos with obesity, 84.4% were insured, while 15.4% lacked health insurance coverage.

Conclusion: Despite a high obesity rate, 82% of Latinos rated their health as "Good to Excellent," suggesting a gap between perceived and actual health status. Additionally, 25.7% identified as non-U.S. citizens, indicating the need for further exploration of how citizenship and insurance status may impact health outcomes. Future analyses will report prevalence ratios assessing obesity, adjusting for covariates, including age, sex, education, self-reported health status, and citizenship status, with stratified analyses by sex and citizenship status.

Supported by:

Primary Presenter / email: **Valenzuela-Silva, Melina** / mva262@uky.edu  
**Graduate Student**  
**Community Research**

Presentation **252**

Abstract Title: **Unveiling the overlooked: Multiallelic Variants in Brain Arteriolosclerosis**

Author(s): K. Z. Aung 1,2 , X. Wu 1,2 , I. Tsuchiya1,2 , L. M. Shade 1, E. L. Abner 2,3, P. T. Nelson 2,4, D. W. Fardo1,2, Y. Katsumata 1,2 ; 1. Department of Biostatistics, U of Kentucky; 2. Sanders-Brown Center on Aging, U of Kentucky; 3. Department of Epidemiology and Environmental Health; 4. Department of Pathology, U of Kentucky

**Abstract:** Background: Brain arteriolosclerosis (B-ASC), a subtype of small vessel pathology, is present in more than 50% of individuals over the age of 80 years and is associated with cognitive impairment, motor dysfunction, and sleep disturbance. We previously conducted autopsy-based genome-wide association study (GWAS) and identified the B-ASC-associated single nucleotide polymorphisms (SNPs). To characterize the genetic architecture of B-ASC, we need investigate beyond SNPs. Multiallelic variants are likely to be ignored in GWAS because standard statistical analysis methods are designed for biallelic variants. In this study, we applied score-based testing within the generalized linear model framework and explored multiallelic variant associations with autopsy-confirmed B-ASC in autosomal chromosomes. Methods: We used whole-genome sequencing (WGS) data from the Alzheimer's Disease Sequencing Project (ADSP) and the B-ASC phenotype data from the National Alzheimer's Coordinating Center (NACC) neuropathology (NP) dataset (September 2023 data freeze). We dichotomized the B-ASC data (NACCARTE) into 0 = no/mild (n= 1,192) and 1 = moderate/severe (n=948). The model included sex, age at death, and the top three principal components as covariate and computed global scores with p-values. Results: The genomic regions and genes with their p-values of less than  $1 \times 10^{-5}$  indicate potential involvement of these loci in B-ASC. Further investigation of the identified genes (HULC, CCDC3, DCUN1D2) and associated intergenic regions may provide insights into the genetic basis of B-ASC. Conclusion: We investigated possible associations between human multiallelic variants and B-ASC risk. These are underexplored areas — both the genetic phenomena of multiallelic variants, and B-ASC as a dementia-driving pathology. Identifying novel genetic variants putatively contributing to the pathogenesis of B-ASC will move the field forward although validation with independent dataset is required.

Supported by: This study is supported by P01AG078116 and P30AG072946

Primary Presenter / email: **Aung, Khine Zin** / khinezin.aung@uky.edu  
**Postdoctoral Scholar/Fellow**  
**Translational Research/Science**  
**AI/Machine Learning/Bioinformatics**

**Presentation 253**

Abstract Title: **Kentucky's Contraceptive Deserts: Geographic Variations in Contraceptive Care Measures among Medicaid Enrollees**

Author(s): D. K. Miracle, Department of Biostatistics, U of Kentucky; S. Slavova, Department of Biostatistics, U of Kentucky; J. Talbert, Institute for Biomedical Informatics, U of Kentucky; D. C. Moga, Department of Pharmacy Practice and Science, U of Kentucky; P. R. Freeman, Department of Pharmacy Practice and Science, U of Kentucky

**Abstract:** Objective: To evaluate contraceptive care measures among the Kentucky Medicaid population and assess for geographic variation among Kentucky counties.

Methods: This cross-sectional study was conducted using Kentucky Medicaid claims from the calendar year 2019. Contraceptive care quality measures were defined as the percentage of female enrollees aged 15-44 at risk of unintended pregnancy who were provided 1) long-acting reversible contraceptives (LARCs) (intrauterine devices/systems or subdermal implants); or 2) most or moderately effective methods (MMEMs) (LARC, tubal sterilization, oral, transdermal, injectable, vaginal, or diaphragm). Choropleth maps, along with global spatial autocorrelation and local clustering analyses (via univariate global and local Moran's I, respectively), were utilized to assess for geographic variation and identify contraceptive provision deserts.

Results: Of 239,160 enrollees who met inclusion/exclusion criteria, 41.9% were provided a MMEM and 4.6% were provided a LARC. Significant global spatial autocorrelation was found for both MMEM (pseudo p-value=0.001) and LARC measures (pseudo p-value=0.001). Locally, clusters of high LARC provision rates were found in the north central areas of Kentucky (surrounding Louisville and Lexington metropolitan areas) while significant local clustering of low LARC provision rates were found in southcentral, southeastern, and northwestern Kentucky. Regarding MMEMs, clusters of high provision rates were found in the northeast and southwestern Kentucky regions, while clusters of low provision rates were dispersed throughout the northern half of the state.

Conclusion: Significant geographic variations in contraceptive provision rates exist across Kentucky. Efforts aimed at improving contraceptive access, particularly for LARC methods, should aim to improve access in these contraceptive provision deserts.

Supported by: This study was supported, in part, by the National Institutes of Health (NIH) National Center for Advancing Translational Sciences through grant number UL1TR001998.

Primary Presenter / email: **Miracle, Dustin** / [dustin.miracle@uky.edu](mailto:dustin.miracle@uky.edu)  
**Postdoctoral Scholar/Fellow**  
**Health Equity Research**



Presentation 254

Abstract Title: **Impact of Tobacco Use on Sleep Patterns in a Cohort of Appalachian Young Adults Using Wearable Technology: A Pilot Study**

Author(s): E. Haynes, Department of Epidemiology and Environmental Health, U of Kentucky; T. Hilbert, Department of Epidemiology and Environmental Health, U of Kentucky

**Abstract:** Background: Tobacco use is known to adversely affect health, but its impact on sleep architecture in young adults remains underexplored. This pilot study investigates the relationship between tobacco use and sleep patterns using objective data from wearable technology and daily surveys.

Methods: Twenty young adults aged 18-25 were recruited from the ongoing Communities Actively Researching Exposure Study (CARES) based on self-reported tobacco product use. Over seven consecutive days, quantitative sleep data were collected using Motionlogger watches, which provided detailed measures of sleep duration, latency, and disturbances. Participants completed 7 daily surveys reporting their tobacco product use and perceived sleep quality. The study used a mixed-methods approach to analyze quantitative sleep data from Motionlogger watches and qualitative self-reported data from daily surveys.

Results: Preliminary analysis from daily surveys for the first 10 participants indicated 3 tobacco users and 7 non-users. Two of the 3 tobacco users reported the lowest 7-day average sleep duration [STD] among the 10 participants (5.1 [1.5] and 5.6 [0.5] hours). Further results will include aligning detailed analysis of Motionlogger data with subjective reports to elucidate subjective and objective agreement of sleep behaviors and explore the relationship between frequency, timing, and type of tobacco use and specific sleep architecture disturbances.

Conclusion: The preliminary findings suggest a discernible impact of tobacco use on sleep duration among young adults. This pilot study underscores the importance of considering sleep disturbances when evaluating the health impacts of tobacco. Moreover, it highlights the utility of employing wearable sleep trackers in conjunction with subjective sleep data in underserved populations in epidemiological research.

Supported by: UK-CARES pilot grant (5P30ES026529-07) and Other support for the existing CARES cohort by the NIEHS (R01ES016531, R21ES021106, R01ES02644601A1, R24ES030904, 5P30ES026529-03; P30ES023515; R24ES028522; 2T32ES010957-16).

Primary Presenter / email: **McWhorter, Ketrell** / ketrell.mcwhorter@uky.edu  
**Faculty**  
**Community Research**

Presentation **255**

Abstract Title: **Budgetary Choices by People With Living Experience for Harm Reduction Vending Machine Implementation**

Author(s): T. Moffitt; Transylvania U; Substance Use Priority Research Area, U of Kentucky; L. Maybrier; College of Public Health, U of Kentucky; A.B., Harm Reduction Collaborative of Eastern Kentucky (HRCEKY); E.D., HRCEKY; J.H., HRCEKY; T.L., HRCEKY; A. Young, College of Public Health, U of Kentucky

**Abstract:** Harm reduction vending machines (HRVMs) implementation has been complicated in some communities by 1:1 syringe exchange policies. Often, local agency partners have ultimate authority on design and budgetary decisions around HRVM implementation. We present a novel model in which authority for budgetary decisions rests with a community advocacy group comprised of people living with experience with substance use (PLWE).

The Harm Reduction Collaborative of Eastern Kentucky (HRCEKY) is a community advocacy group comprised of PWLE dedicated to supporting harm reduction service engagement in rural Appalachian Kentucky. Aiming to inform HRVM design for syringe exchange, HRCEKY was provided with a design budget and received funding requests to support additional features requested by local partner agencies: 1) sharps container dispensing with every syringe vend and, 2) taking the machine offline when the depository sharps bin was full. Neither requirement was a priority of local PWLE, who instead prioritized a third (3) feature: syringe type selection. HRCEKY members voted to approve all three features: syringe choice (\$3200), sharps bin capacity detector (\$2400), and sharps container dispensing (\$1600). In sum, this represented a 12% increase in the HRVM project budget and reduced the budget (~\$50,000) available for other harm reduction services by 14%. A contracted entity installed the prototype in the community on September 16, 2024, anticipating client access launch in Spring 2025.

HRCEKY's member-driven budget decisions is a novel approach to community-engaged harm reduction programming, highlighting the feasibility of PWLE engagement in leading decisions often left to project leads.

Supported by: The Harm Reduction Collaborative of Eastern Kentucky (HRCEKY) is funded by Vital Strategies, Inc. HRCEKY recruitment leveraged advisory boards established by studies funded by the National Institutes of Health (R01 DA055872, PI: Young; UG3 DA044798, PI: Young, Cooper). We wish to acknowledge the CARE2HOPE Research Staff for their support in establishing the HRCEKY and the HRCEKY members for their leadership in this project. The content is solely the responsibility of the authors and does not necessarily represent the official views of Vital Strategies.

Primary Presenter / email: **Moffitt, Trevor** / tmoffitt@transy.edu  
**Faculty**  
**Community Research**

**Presentation 256**

Abstract Title: **Non-Emergent Use of the ED by UK Internal Medicine Group Patients**

Author(s): Tina Bennett PA-S, Merrick Cooley PA-S, Grace Osborn PA-S, Mallori Smith PA-S, Bethany Stewart PA-S, Dr. Kevin Schuer DrPH PA-C, Department of Physician Assistant Studies, U of Kentucky

**Abstract:** Introduction: Inappropriate utilization of emergency departments (ED) for non-emergent conditions continues to burden healthcare systems. Most of these non-emergent conditions could be better handled by primary care providers. This study investigated characteristics of University of Kentucky Internal Medicine Group (UK IMG) patients who frequently presented to the ED for non-emergent, or primary care needs. These visits were categorized during triage using the Emergency Severity Index (ESI), with ratings of 4 or 5 deemed non-emergent. This study identified potential patterns to assist clinicians and administrators in reducing ED burden through targeted interventions and improved primary care engagement. Methods: A retrospective cohort study analyzed de-identified data from January 1, 2023 to December 31, 2023 and aimed to identify characteristics of UK IMG patients who frequently presented to the emergency department (ED) for primary care needs. Selected characteristics included patient demographics, comorbid conditions, diagnoses, and social determinants of health. The Charlson Comorbidity Index (CCI) and Elixhauser Comorbidity Index (ECI) were used to highlight predictors of non-emergent ED visits among the study population. Results: The research team has been in regular contact with CCTS for data analysis. De-identified data has been received by the research team. Next steps include assignment of a graduate student to assist in analysis of the data.

Supported by: Completed in collaboration with CCTS, Center for Clinical and Translational Science, under IRB protocol #45668. The CCTS is supported by the NIH National Center for Advancing Translational Sciences through grant number UL1TR001998.

Primary Presenter / email: **Bennett, Tina** / Tina.Bennett@uky.edu  
**Graduate Student**  
**UK CHS-PA Student Research**

**Presentation 257**

Abstract Title: **Cross-Cultural Insights into Professional Identity Formation Among PA Students: A Four Country Pilot Study**

Author(s): Gracelyn Bush, Jessie Fraley, Chloe Irvin, Grace Lowe, Abby Nelson, Virginia Valentin DrPH PA-C, Department of Physician Assistant Studies, U of Kentucky

**Abstract:** The purpose of this pilot study is to explore the factors influencing the development of professional identity (PI) among Physician Assistant (PA) students in the United States (US), Germany, the Netherlands, and England. Research on PI formation in PAs is limited, yet other studies have shown improvement in provider confidence and patient outcomes. This study aims to examine how cultural, educational, and clinical experiences shape PA students' perceptions of their roles as providers. For this study, the adapted definition of PI is "a representation of self, achieved in stages over time during which the characteristics, values, and norms of the PA profession are internalized, resulting in an individual thinking, acting, and feeling like a PA." The study employs a mixed-methods approach, including a quantitative survey using a modified Professional Identity Five-Factor Scale (PIFFS) and qualitative focus groups with each university via Zoom. The survey will gather demographic information and perceptions of PI development on a five-point Likert scale. Focus group discussions will explore PA students' insights into PI formation. Study design includes PA students from the University of Kentucky (US), Han University (Netherlands), Fliedner University (Germany), and St George's University (UK). Data will be analyzed through descriptive and inferential statistics and thematic analysis of focus group transcripts. Research on PI formation is critical to bridge the gap in PA literature and offer insights into curriculum development that integrates PI training. By comparing cross-cultural perspectives, the study hopes to enhance knowledge around PI formation and the components that may influence development.

Supported by: The authors wish to acknowledge and express appreciation for the collaborating institutions: University of Kentucky, Han University, Fliedner University, St George's University.

Primary Presenter / email: **Bush, Gracelyn** / gracelyn.bush@uky.edu  
**Graduate Student**  
**UK CHS-PA Student Research**

**Presentation 258**

Abstract Title: **Disparities in Pulmonary Disease Prevalence: A Comparison of Rural and Urban Kentucky**

Author(s): Hannah Daniels, Morgan Evarts, Emily Roberts, Sarah Banks, Haley Dillow, Misty Arrington  
DMSc PA-C, Department of Physician Assistant Studies, U of Kentucky

**Abstract:** Chronic lower respiratory diseases (CLRD) account for some of the top leading causes of morbidity and mortality in the United States. This study seeks to explore the prevalence of pulmonary diseases across the state of Kentucky with emphasis on the disparities between urban and rural communities. Examining the CLRD trends as well as readmission rates of the patient population is of interest due to various social determinants of health in rural medicine. The study design will involve a quantitative data retrospective analysis of inpatient admissions regarding hospitalizations of chronic pulmonary diseases at the University of Kentucky medical centers. This investigation has the primary goal of assessing the direct correlation between population codes, admission diagnoses, length of hospital stay, and readmission rates attributed to pulmonary disease states. Additionally, evaluation of pre-existing comorbidities will be assessed in relation to the overall health outcome. Data will be collected from electronic health records (EHRs) of University of Kentucky medical centers. Specifically, the 2021-2024 data is from the UK Center for Clinical and Translational Science (CCTS).

Supported by: The project described was supported by the NIH National Center for Advancing Translational Sciences through grant number UL1TR001998. The content is solely the responsibility of the authors and does not necessarily represent the official views of the NIH.

Primary Presenter / email: **Daniels, Hannah** / hannah.daniels1@uky.edu  
**Graduate Student**  
**UK CHS-PA Student Research**

**Presentation 259**

Abstract Title: **Examining the Common Comorbidities in Pregnant Women with SUD Presenting to UK Health Systems in Kentucky**

Author(s): Makayla Baker, Alex Flora, Kylee Lawson, Samantha Lenox, Rachel Woods, Department of Physician Assistant Studies, U of Kentucky;  
Dr. Chris Delcher, College of Pharmacy, U of Kentucky; & Professor Cheryl Vanderford, Department of Physician Assistant Studies, U of Kentucky

**Abstract:** Introduction: Despite the growing national awareness and education of substance use disorders (SUD) in pregnancy, there exists a marked gap in research addressing the specific co-morbidities faced by pregnant women in Kentucky. The purpose of this research is to identify any patterns of common co-morbid medical and psychological conditions among pregnant women with opioid and/or stimulant SUD within the state of Kentucky. This study examines severity or complexity of comorbid medical or psychiatric diagnoses with the patient's gestational age or length of stay. The relationship between gestational age and the prevalence of specific comorbidities in pregnant patients with SUD is also examined. Methods: 2,616 participants in our study were patients at UK HealthCare facilities from 2017-2023. The data was obtained from the University of Kentucky's Pharmacy Department Insurance Database. A UK statistician analyzed the data with descriptive statistics to find the frequencies, averages, etc. Discussion: This research aims to address the prevalence posed by the opioid and stimulant epidemic in Kentucky, which contributes to negative health outcomes in pregnant women. Pregnant women with SUD in Kentucky are a group that have not been studied in this context, and by highlighting these common diagnoses and patterns in complexity, treatment plans and screening can be more directed to improve health outcomes.

Supported by:

Primary Presenter / email: **Flora, Alex** / Arf1233@uky.edu  
**Graduate Student**  
**UK CHS-PA Student Research**

**Presentation 260**

Abstract Title: **Influential Themes in Clinical Practice: Insights from 50 Years of UKPA Alumni**

Author(s): Nicolas Beltran, Madelyn Burgess, Olivia Goerd, Allison Houk, Makayla Wright, Hannah Anderson MSPAS PA-C, Department of Physician Assistant Studies, U of Kentucky

**Abstract:** The University of Kentucky Physician Assistant Studies (UKPA) program, celebrating its 50th anniversary, has trained over 1,500 graduates who have significantly contributed to the healthcare industry worldwide. This study aims to identify common influential themes among UKPA alumni regarding their experiences during their time in the program and beyond. By analyzing alumni perspectives, the program can implement meaningful improvements to better prepare future physician assistants (PAs) for the evolving healthcare landscape.

This qualitative exploratory study utilized semi-structured oral interviews conducted via Zoom with UKPA alumni from the past 50 years. A convenience sampling method was utilized, with participant contact information sourced from the UKPA Alumni Association Database. Each interview, lasting no longer than 60 minutes, was audio-recorded and thematically analyzed to identify recurring patterns and insights. The data was categorized by decade to assess how the program's impact has evolved over time. Understanding the elements of PA education that alumni find most influential, in addition to understanding practicing PA's perspectives on healthcare collaboration and changes in the healthcare system, is crucial for ensuring that graduates are well-equipped to meet the increasing demands of healthcare. Given the anticipated growth in the PA workforce, the need for confident competence among new graduates is more pressing than ever. This study aims to provide the UKPA program with vital insights about alumni experiences that could influence meaningful change for future graduates.

Supported by:

Primary Presenter / email: **Houk, Allison** / aeho255@uky.edu  
**Graduate Student**  
**UK CHS-PA Student Research**

**Presentation 261**

Abstract Title: **Impact of Transportation Barriers and Distance to Medical Facilities on Follow-Up Care in Rural Communities**

Author(s): Gaby Kotten, Kristen Peterson, Ashley Smith, Sam Smith, Sean Whitehouse, Avram McCarty  
MSPAS PA-C, Department of Physician Assistant Studies, U of Kentucky

**Abstract:** The purpose of this study is to explore how transportation and distance from medical facilities impacts patients living in rural communities seeking follow-up care. This is an observational cross-sectional study which surveyed a sample of patients attending family care appointments within the University of Kentucky St. Claire system in rural communities of Eastern Kentucky. Access to healthcare has long been an issue in rural communities with transportation barriers proving to be a complex topic with significant impact placed upon patients. This research aims to identify specific transportation barriers for patients in rural Eastern Kentucky, which in turn will provide important insight on how to combat this barrier and provide more accessible healthcare in Eastern Kentucky.

Supported by:

Primary Presenter / email: **Kotten, Gaby** / [gabrielle.kotten@uky.edu](mailto:gabrielle.kotten@uky.edu)  
**Graduate Student**  
**UK CHS-PA Student Research**



**Presentation 262**

Abstract Title: **Determining Social Factors that Correlate with Emergency Department Bounce Backs at UK Chandler Hospital**

Author(s): Diana Hernandez, Taylor Hord, Khayla Patel, Makena Shelton, MaKayla Slone, Faculty Mentor Ryan Hunton PA-C PhD, Department of Physician Assistant Studies, U of Kentucky

**Abstract:** Avoidable visits to the emergency room (ED) are a growing concern for the quality and access to health care. ED bounce backs are a patient's unscheduled return to the ED within 72 hours of their initial visit. ED bounce backs suggest ED overcrowding and put patients at risk for health complications. Identifying variables correlated to ED bounce backs can help address barriers to healthcare access within a community, with the goal of decreasing the frequency of bounce backs and more accessible healthcare. This study aims to discover social factors contributing to ED bounce backs within the urban region of the 405 zip code by comparing variables between patients who did bounce back to the ED versus those who did not. These variables are measured by data extracted from the Center for Clinical and Translation Services at University of Kentucky (CCTS), which investigated age, gender, sex assigned at birth, gender identity, race, and ethnicity. The study population are patients who visited the ED at the University of Kentucky Chandler Hospital between the dates of November 1st, 2023 and October 31st, 2024. This research was inspired by prior research that compared variables between patients who bounced back to the same ED in the previous year.

Supported by: The project described was supported by the NIH National Center for Advancing Translational Sciences through grant number, UL1TR001998. The content is solely the responsibility of the authors and does not necessarily represent the official views of the NIH.

Primary Presenter / email: **Patel, Khayla** / Kpa358@uky.edu  
**Graduate Student**  
**UK CHS-PA Student Research**

**Presentation 263**

Abstract Title: **Impacts of Gender-Affirming Care on the Mental Health of Transgender and Gender-Nonconforming College Students**

Author(s): Yoomee Kim PA-S, Tyler Lucas PA-S, Taylor Papp PA-S, Emma Spade PA-S, Ashley Quinlan PA-C MSPAS, Department of Physician Assistant Studies, U of Kentucky

**Abstract:** Research shows transgender and gender nonconforming people face significant mental health challenges including anxiety, depression, and suicidal ideation, particularly without adequate support. However, with access to gender-affirming care and university provided resources, students may experience improvement in mental health and well-being. Gender-affirming care, a relatively new area of medical practice, is being implemented across the U.S. including at the University of Kentucky (UK). To date, there have been few research studies aimed at assessing the quality of these programs and the needs of these students. This literature review will aim to compile and summarize the findings addressing university health programs, the needs of transgender and gender nonconforming students, and the role healthcare providers play. Research specific to college students is limited in quantity and literature gaps will be addressed. This review will also summarize findings from studies on the larger population that are applicable to the population. Lastly, this review will set the stage for future research into the assessment of university transgender and gender non-conforming student needs.

Supported by:

Primary Presenter / email: **Quinlan, Ashley** / ashley.quinlan@uky.edu  
**Graduate Student**  
**UK CHS-PA Student Research**

**Presentation 264**

Abstract Title: **Artificial Intelligence in Healthcare: Utilization and Barriers**

Author(s): James Abu-Rahmeh, Catherine Gray, Haley Risinger, Jaylen Robinson, Bailey Roszman,  
Professor Williford MSPAS PA-C, Department of Physician Assistant Studies, U of Kentucky.

**Abstract:** Artificial Intelligence (AI) is gaining popularity and beginning to weave its way into many aspects of healthcare. All the way from robotic surgery, predictive analytics to scribing and administrative duties, AI has been shown to aid in a wide spectrum of medical tasks. This study aims to answer the essential question of how clinicians and other healthcare professionals in rural and urban Kentucky are implementing AI into their daily practice and what possible barriers may deter them. This study utilized an electronic cross-sectional survey using Qualtrics to assess implementation, impact and barriers of AI in rural and urban Kentucky medical practices. The survey was voluntary and anonymous. The survey was sent out to University of Kentucky Healthcare and this study took the qualitative data from Qualtrics and converted it into quantitative values. A series of t-tests and pie charts were used to interpret and organize the data. This study is essential for identifying the status of AI use in healthcare, specifically in urban and rural Kentucky. While AI is continuing to evolve and gain popularity, it is important to stay up to date on what current AI uses are being implemented that improve efficiency and productivity of patient care.

Supported by:

Primary Presenter / email: **Roszman, Bailey** / kbro244@uky.edu  
**Graduate Student**  
**UK CHS-PA Student Research**

**Presentation 265**

Abstract Title: **A Contemporary Review of Nutrition Decision-Making Factors to Inform Development of an mHealth Solution**

Author(s): A. Allemeier PAS, M. Feria PAS, G. Parks PAS, S. Thurman PAS, E. Woods PAS, L. Woltenberg, U of Kentucky PhD, MS Ed

**Abstract:** Purpose: This contemporary review analyzes existing literature on the factors influencing nutrition decision-making to inform the development of an mhealth application. This application will help users make healthy food choices that fit their preferences. Current research emphasizes extrinsic and intrinsic factors impacting food purchasing and consumption; this review aims to synthesize this information to create effective nutritional care plans. Simplifying the nutrition decision-making process may help mitigate rising public health challenges like obesity, diabetes, and malnutrition. Methods: This literature review identified and synthesized peer-reviewed articles using PubMed and the NIH National Library of Medicine. Articles published in English within the past 15 years that focused on relevant aspects of food choice—including physical food characteristics, environmental factors, and socio-economic status—were included. A two-step screening process was conducted by six reviewers, beginning with an assessment of abstracts and titles and incorporating key search terms related to nutrition decision-making. 18 articles were screened, and 13 met the inclusion criteria. This selection of articles were further analyzed using thematic and content analysis. Rationale: Proper nutrition is the key component of patient care, and it is clear that an abundance of factors consciously and unconsciously impact food choice. Research demonstrates that primary care providers need to assist their patients for optimal outcomes, but it is difficult for both patients and providers alike due to the complexity of food choice. By synthesizing current literature in a concise and credible format, this review addresses cognitive, social, and environmental determinants of dietary behaviors to encourage self-regulated dietary management.

Supported by: The project described was supported by the NIH National Center for Advancing Translational Sciences through grant number UL1TR001998. The content is solely the responsibility of the authors and does not necessarily represent the official views of the NIH.

Primary Presenter / email: **Thurman, Sydney** / slth244@uky.edu  
**Graduate Student**  
**UK CHS-PA Student Research**

**Presentation 266**

Abstract Title: **Comparing the Incidence of Pediatric Neuroblastoma in Rural vs. Non-Rural Kentucky: A Statistical Analysis**

Author(s): Kristen Boyken, Jacey Griffith, Chloe Williams, Tanner Lee, Dalton Yates, Shelly Irving MSPAS PA-C, Department of Physician Assistant Studies, U of Kentucky

**Abstract:** Neuroblastoma is one of the most common extracranial solid tumors in childhood that affects those less than 12 months. The current literature suggests geographic disparities in incidence rates and outcomes of pediatric cancers, with rural areas being more negatively impacted. There are several gaps in the literature including differences in incidence rates in rural versus non-rural regions, a lack of analysis of risk factors based on geographic location, and a lack of studies that specifically examine pediatric neuroblastoma incidence rates in Kentucky. The purpose of this study is to investigate the incidence of neuroblastoma diagnoses in the pediatric population in rural versus non-rural areas of Kentucky. This study is a secondary analysis of de-identified surveillance data obtained through collaboration with the Kentucky Cancer Registry (KCR). Patients under 20 years diagnosed with neuroblastoma from 2009 to 2019, regardless of gender, race, or ethnicity, were included. Comparative analysis was used to compare the incidence of pediatric neuroblastoma in rural and non-rural areas of Kentucky. Future implications involve aiding healthcare providers in identifying pediatric neuroblastoma and investigating risk factors affecting rural populations.

Supported by: The research team expresses appreciation for the opportunity to partner with the Kentucky Cancer Registry for this research.

Primary Presenter / email: **Williams, Chloe** / chloe.williams@uky.edu  
**Graduate Student**  
**UK CHS-PA Student Research**

Presentation **267**

Abstract Title: **Comparison of Blood Pressure Measurements within an ALS Clinic**

Author(s): K.R. Wycoff, Student PT, Department of Physical Therapy, U of Kentucky;  
A.R. Howard, Student PT, Department of Physical Therapy, U of Kentucky; Denise O'Dell  
PT, DPT, DSc, Department of Physical Therapy. U of Kentucky.

**Abstract:** Purpose: To identify discrepancies between BP measurements using manual and automated equipment in the management of patients with ALS, identify patients with variance in BP including identifications of muscle fasciculations and variance in anthropometrics.

Subjects: 23 patients attending the ALS clinic at UK.

Methods: Arm circumference and skinfold thickness were measured. The circumference of their arm was used to identify appropriate cuff size. BP was measured in their left arm using a standard protocol. BP was measured once with the automated cuff, and once with the manual cuffs. A paired T-test and Wilcoxon signed-rank test were used to identify differences.

Results: For most individuals, there was no significant difference between standard and automated BP measures. Those with muscle fasciculations in the upper extremity and a low BMI compared to high BMI the results showed a significant difference in diastolic BP when using automated versus standard BP measurements. Previous literature shows that ALS affects the autonomic nervous system as it progresses with changes in BP, heart rate, and the baroreceptor reflex. The MCID for diastolic BP is 3-5 mmHg<sup>2</sup>. Our study had an average difference of 4 mmHg when comparing automated versus standard diastolic BPs. Clinicians should recognize and identify the impact of body composition and neuromuscular status in individuals with ALS and how these factors can influence BP measurements.

Conclusions: When considering individuals with a diagnosis of ALS/PLS with muscle fasciculations and a small BMI of <22 kg/m<sup>2</sup>, therapists may want to consider re-checking BP with an automated cuff.

Supported by: Department of Physical Therapy for Time of Faculty Member.

Primary Presenter / email: **Wycoff, Kaitlyn** / krwy223@uky.edu  
**Professional Student (MD, PharmD, Dentistry, PT)**  
**Clinical Research**

**Presentation 268**

**Abstract Title: A Theoretical Framework for Research in Massage Therapy in Patients with Cancer**

**Author(s):** J.S. Cole, Departments of Integrative Medicine and Health and Rehabilitation and Health Sciences Ph D Program, U of Kentucky; E.E. Dupont-Versteegden, Departments of Physical Therapy and Rehabilitation and Health Sciences Ph D Program, U of Kentucky; C. G. Page, Departments of Communication and Science Disorders and Rehabilitation and Health Sciences Ph D Program, U of Kentucky

**Abstract:** Pain and anxiety affect nearly half of patients with cancer, and high symptom burden causes stress during treatment. Both massage therapy and interventions focused on resilience-building have been reported to ease symptoms. Resilience theory explains how a patient's resilience can help them navigate stressful events and return to health. Resilience at the family and health system level also affect a patient's ability to cope, recover, and rehabilitate after illness. Massage therapy is reported to reduce pain and anxiety, but its effect on resilience has not been studied. The purpose of this paper is to propose resilience theory as a framework for the role of massage therapy, symptom burden, and resilience, and how these might interact in patients with cancer.  
**Key words:** resilience theory, massage therapy, cancer, pain, anxiety

Supported by:

**Primary Presenter / email:** **Cole, Jill** / [jill.cole1@uky.edu](mailto:jill.cole1@uky.edu)  
**Graduate Student**  
**Clinical Research**

Presentation **269**

Abstract Title: **Basic Training to Discharge: Long-Term Effects of Bone Stress Injuries on Military Career and Healthcare utilization.**

Author(s): G. Dredge, Sports Medicine Research Institute, U of Kentucky

**Abstract:** Background: Bone stress injuries (BSIs), the leading cause of lost duty days in military Basic Combat Training (BCT), affect 3-20% of trainees. The long-term career and health implications for those who graduate despite a BSI remain unclear.

Study Aim: This study aims to evaluate the long-term impacts of BSIs on trainees who successfully complete BCT. Specifically, it examines Advanced Individual Training (AIT) graduation rates, discharge rates within four years following BCT graduation, and healthcare utilization for musculoskeletal injuries among BCT graduates with and without BSIs.

Results: A total of 1,407 trainees were diagnosed with a BSI during the inclusion period, of whom 895 (63.6%) graduated BCT and were included as cases for final analysis. A control group of 2,685 age- and gender-matched BCT graduates was selected for comparison. Among 895 cases, 87.4% graduated from AIT vs. 94.6% of controls; adjusted logistic regression showed controls were significantly more likely to graduate (OR = 3.66, 95% CI: 2.47–5.42). At four years post-BCT, active-duty retention was lower in cases (43.1%) than controls (53.9%), with logistic regression confirming higher retention likelihood in controls (OR = 1.54, 95% CI: 1.32–1.79). Survival analysis indicated that cases were discharged earlier than controls (HR = 1.267, 95% CI: 1.182–1.357,  $p < 0.0001$ ). Over the same period, cases averaged  $40.6 \pm 38.0$  musculoskeletal medical encounters per subject, compared to  $25.8 \pm 31.4$  for controls, a mean difference of 14.82 encounters ( $p < 0.0001$ ).

Conclusion: BCT graduates with BSIs demonstrated poorer long-term outcomes compared to their peers, including lower AIT graduation rates, higher discharge rates, and increased musculoskeletal healthcare utilization.

Supported by:

Primary Presenter / email: **Dredge, Garry** / [garry.dredge@uky.edu](mailto:garry.dredge@uky.edu)  
**Graduate Student**  
**Clinical Research**



Presentation 270

Abstract Title: **Skeletal muscle wasting in patients with critical illness requiring kidney replacement therapy: a prospective study**

Author(s): F. González-Seguel, U of Kentucky; V. Q. Tran, U of New Mexico; J. P. Teixeira, U of New Mexico; J. M. Gross, U of New Mexico; A. Horikawa-Strakovsky, U of Kentucky; C. A. Pal, U of New Mexico; Z. T. Shareef, U of New Mexico; H. P. Israel, U of New Mexico; Y. Wen, U of Kentucky; B. R. Griffin, U of Iowa; J. A. Neyra, U of Alabama; K. P. Mayer, Department of Physical Therapy, U of Kentucky

**Abstract:** Objective: To quantify the changes in rectus femoris (RF) size and quality in the first 7 days following continuous kidney replacement therapy (CKRT) initiation and measure the incidence of intensive care unit-acquired weakness (ICUAW) in adults with severe acute kidney injury (AKI) requiring CKRT. Methods: This prospective observational study evaluated adults with critical illness and AKI requiring CKRT at two U.S. academic hospitals. Using ultrasonography, we quantified changes in RF size and quality in the first week after CKRT initiation. At hospital discharge, we measured ICUAW incidence (defined by manual muscle testing). Results: Twenty-three patients with median age 56 [IQR 47–60] years, BMI 29 [26–36] kg/m<sup>2</sup>, and Charlson Comorbidity Index 3 [1.5–5] were enrolled. Baseline Sequential Organ Failure Assessment score was 9 [7.5–11.5] and CKRT duration was 4 [1–7] days. Six (26%) patients died in the ICU and one (4%) transferred to comfort measures before study completion. Significant muscle wasting occurred from Day1 to Day7: RF muscle thickness (mT) decreased by 10% [3%–20%]; RF cross-sectional area (CSA) decreased by 19% [12%–22]; and echointensity increased (implying worse muscle quality) by 14% [5%–25%]. Significant effect of time within subjects was observed for all three ultrasound measures (CSA: F=66, p<0.001; mT: F=27, p<0.001; echointensity: F=23, p<0.001). At hospital discharge, 67% of survivors (n=10/15) met criteria for ICUAW. Conclusions: Patients with AKI requiring CKRT experienced significant muscle wasting in the first week following CKRT initiation, and had high rate of ICUAW at hospital discharge.

Supported by: The project was supported by the NIH National Center for Advancing Translational Sciences through grant number UL1TR001998. Dr. Kirby Mayer was supported by the National Institute of Health K23-AR079583. The content is solely the responsibility of the authors and does not necessarily represent the official views of the NIH.

Primary Presenter / email: **Gonzalez Seguel, Felipe** / fgonzalez-seguel@uky.edu  
**Graduate Student**  
**Clinical Research**

**Presentation 271**

Abstract Title: **The Relationship Between Self-Reported Motivation and Physical Activity Level Among Young Adults: A Secondary Analysis**

Author(s): Kallie Nowell MS, ATC, Dee Dlugonski PhD, and Johanna M. Hoch PhD, ATC; U of Kentucky, College of Health Sciences, Rehabilitation and Health Sciences

**Abstract:** Context: Physical activity (PA) engagement declines with age. Motivation is associated with PA, and demographic variables such as sex and student status may influence motivation for PA. Therefore, the aims of this study were to compare young-adult exercise motivation and self-reported PA by sex and student status and to examine the relationship between self-reported PA and exercise motivation.

Methods: 234 young-adults (76.8% Female, age 22.22±2.1 years, 65% student) participated in this cross-sectional study. Participants completed a demographics questionnaire, the Behavioral Regulation in Exercise Questionnaire (BREQ-3) and the Godin Leisure-Time Exercise Questionnaire (GLTEQ). The BREQ-3 subscales include: amotivation, external regulation, introjected regulation, identified regulation, integrated regulation and intrinsic motivation. Separate analysis of variance (ANOVA) were used to compare the dependent variables (BREQ-Total and subscales) between both sex (male, female) and student status (student, non-student).

Pearson's correlation coefficients were used to identify associations between the dependent variables.

Results: Means and standard deviations for the dependent variables by group can be found in Table 1. Males reported a significantly higher level of amotivation to exercise (Table 1). No other differences between groups were identified. GLTEQ total scores were associated with amotivation ( $r=0.26$ ,  $p<0.01$ ) and integrated regulation ( $r=0.16$ ,  $p<0.05$ ).

Conclusions: Males may feel more absence of drive to exercise than females. Our findings of a significant association between GLTEQ total score and BREQ-3 amotivation and integrated regulation scores are consistent with current literature. Future research should explore amotivation as a barrier and integrated regulation as a facilitator to increasing PA in young adults.

Supported by:

Primary Presenter / email: **Nowell, Kallie** / [kallie.nowell@uky.edu](mailto:kallie.nowell@uky.edu)  
**Graduate Student**  
**Clinical Research**  
**Physical Activity**

**Presentation 272**

Abstract Title: **Comparing Patient-Reported Outcomes in Individuals with Chronic Ankle Instability Based on Mental Health Condition Diagnosis**

Author(s): B. M. Walsh, Department of Athletic Training and Clinical Nutrition, U of Kentucky; J. M. Hoch, Department of Athletic Training and Clinical Nutrition, U of Kentucky; M. C. Hoch, Department of Athletic Training and Clinical Nutrition, U of Kentucky

**Abstract:** The purpose of this study was to compare scores on patient-reported outcome measures (PROs) in individuals with chronic ankle instability (CAI) based on history of a diagnosed mental health condition. 81 individuals with chronic ankle instability (53 Female, 41 with a Mental Health Condition, Age: 32.15±8.67, Episodes of Giving Way: 3.12±2.18) volunteered to participate in this online survey study. Participants were included if they were between the ages of 18-55 and met previously established recommendations from the International Ankle Consortium. All participants completed a demographics questionnaire and a series of PROs, which included the NASA Physical Activity Rating Scale (NASA), the Foot and Ankle Disability Index (FADI), the Fear-Avoidance Beliefs Questionnaire (FABQ), and the Modified Disablement in the Physically Active Scale (mDPA). Separate univariate analyses were used to compare scores between groups using Mann-Whitney U tests while controlling for sex. Alpha was set a priori at  $p \leq 0.05$ . No significant differences in FADI-Activities of Daily Living, FADI-Pain, FADI-Sport, FABQ-Work, FABQ-Physical Activity, mDPA-Physical Summary Component or NASA was identified between groups. However, when controlling for sex, the group with a diagnosed mental health condition reported greater scores on the mDPA-Mental Summary Component ( $p=0.003$ ). Individuals with CAI do not report a difference in perceived ankle function based on diagnosis of a mental health condition. However, individuals with CAI who have comorbid mental health conditions report more disability with the Mental Summary Component of the mDPA than their counterparts who have never been diagnosed with a mental health condition. This suggests that individuals with CAI who have been diagnosed with a mental health condition may be more greatly impacted by the psychosocial impact of injury compared to those who have never been diagnosed with a mental health condition.

Supported by:

Primary Presenter / email: **Walsh, Bridget** / [bridget.walsh@uky.edu](mailto:bridget.walsh@uky.edu)  
**Graduate Student**  
**Clinical Research**

**Presentation 273**

Abstract Title: **The Influence of Speaking Rate on Reaction Time: Uncovering Cognitive Load in Speech Modification**

Author(s): J.W. Yeatts, Department of Rehabilitation Sciences, U of Kentucky  
B. Leslie, Department of Communication Sciences and Disorders, U of Kentucky; I. Cramer,  
Math, Science, and Technology Center Program, Paul Laurence Dunbar High School; K.  
Ishikawa, Department of Communication Sciences and Disorders, U of Kentucky

**Abstract:** Optimizing cognitive load during speech modification is essential for effective speech therapy. Prior research shows that reaction time (RT) for a visual secondary task increases during clear speech, typically spoken at a slower rate, raising questions about whether this reflects cognitive load or motor synchronization. This study investigated which factor primarily influences RT during speech at varying rates. Six healthy female American English speakers (ages 19–21) completed a visual RT task while counting numbers at slow, habitual, and fast speaking rates. Results showed mean RTs of 0.47 s (Slow), 0.44 s (Habitual), and 0.51 s (Fast), with a significant effect of speaking rate on RT,  $F(2, 2665) = 17.50, p < .001$ . Fast speech led to longer RTs than both slow and habitual speech. These findings suggest that increased cognitive load, rather than motor synchronization, drives RT differences, with fast speech imposing the greatest cognitive demands.

Supported by:

Primary Presenter / email: **Yeatts, Jennifer** / [jennifer.yeatts@uky.edu](mailto:jennifer.yeatts@uky.edu)  
**Graduate Student**  
**Clinical Research**  
**Behavioral Research**

**Presentation 274**

Abstract Title: **Examining Interventions Provided by OT/PT/SLP in Disorders of Consciousness: A Scoping Review**

Author(s): J. Neikirk, Department of Rehabilitation Sciences, U of Kentucky, C. Robinson, MCL Library, U of Kentucky

**Abstract:** Background: Disorders of consciousness (DoC) describes a cohort of individuals post traumatic brain injury that demonstrate limited arousal and inability to interact with their environment. Occupational therapists, speech language pathologists, and physical therapists play a key role in rehabilitation, aiming to stimulate emergence from the DoC state. However, despite their consistent involvement in care, there is limited evidence-based guidance on effective treatment strategies to improve arousal in this population.

Purpose: This scoping review aims to identify and describe the provided interventions from occupational therapy, physical therapy, and speech language pathology with the focus on emergence.

Methods: A medical librarian conducted a comprehensive systematic search in multiple databases, including: PubMed, Elsevier's Embase, Web of Science Core Collection, Dissertations & Theses index via Clarivate, CINAHL Complete, SPORTDiscus, PsycInfo, Cochrane Database of Systematic Reviews and Cochrane CENTRAL, ProQuest's Linguistics and Language Behavior Abstracts, and Google Scholar. Gray literature was sourced both within the databases, and externally by the primary investigator. The PEDro database was hand-searched by the research team. Two reviewers completed title/abstract review while three reviewers will perform full-text screening. Conflicts are discussed in person to achieve consensus.

Emerging Results: A total of 38,171 articles were initially screened based on title and abstract. Of these, 604 articles were selected for full-text review. Preliminary findings suggest a diverse range of intervention strategies across disciplines, including sensory stimulation, motor-based rehabilitation, and communication-focused interventions. Further analysis will explore the effectiveness of specific interventions, common themes in therapeutic approaches, and gaps in the current literature.

Supported by:

Primary Presenter / email: **Neikirk, Jenna** / [jenna.neikirk@uky.edu](mailto:jenna.neikirk@uky.edu)  
**Graduate Student**  
**Dissemination & Implementation Research**

Presentation **275**

Abstract Title: **Saddled with Pain: Equestrian Athletes Stay Active Despite Chronic Pain**

Author(s): E. Ohrnberger, Department of Athletic Training and Clinical Nutrition, U of Kentucky; M. Keener, Department of Athletic Training and Clinical Nutrition, U of Kentucky

**Abstract:** Introduction: Chronic pain (CP) is the leading cause of disability in the US, impacting ~28% of the adult US population. Equestrian athletes (EqA) report higher rates of CP than the general adult population. The impact of CP on physical activity (PA) in EqA is unknown. The purpose of this study is to evaluate differences in PA engagement in EqA who do and do not report CP.

Methods: An online survey was distributed across social media and included self-reported questions about PA and CP. Inclusion was EqA 12+ years old, living in the US. Data analysis included Spearman and point-biserial correlations, Mann-Whitney U tests, and logistic regressions.

Results: The dataset includes 2,091 EqA (95.7% females, 43.9% experiencing CP). EqA experiencing CP reported spending an average of 30 min/week more riding and 40 min/week more completing barn work compared to healthy counterparts ( $p=0.026$ ). EqA without CP engaged in more non-riding cardiovascular PA than EqA with CP (low intensity:  $p=0.005$ , moderate-vigorous intensity:  $p=0.046$ ). Professional EqA were 1.44x more likely to experience CP than recreational EqA ( $p=0.006$ ). When accounting for competitive level, time riding was not predictive of CP ( $p=0.278$ ), while time engaging in barn work was ( $p=0.002$ ).

Conclusion: Our findings support higher rates of CP in EqA than the general US adult population. Despite experiencing CP, EqA continue to engage in higher levels of PA compared to healthy counterparts — a finding unique to the EqA population. Deeper understanding of these findings may translate to novel treatments and improve outcomes in other CP populations.

Supported by: The project described was supported by the NIH National Center for Advancing Translational Sciences through grant number UL1TR001998. The content is solely the responsibility of the authors and does not necessarily represent the official views of the NIH

Primary Presenter / email: **Ohrnberger, Elisabeth** / eaoh222@uky.edu  
**Graduate Student**  
**Community Research**

Presentation **276**

Abstract Title: **Gender Differences in Lower Limb Prosthetic Prescription Rates: a systematic review**

Author(s): H. E. Young, Department of Rehabilitation and Health Sciences, U of Kentucky

**Abstract:** Certain sub-groups of patients with lower extremity amputation have demonstrated poorer rehabilitation outcomes increased healthcare cost due to a longer time to prosthetic prescription. The purpose of this systematic review is to take an in-depth look at the available literature regarding differences that exist between men and women in time to receiving a prosthesis. A systematic search was conducted using PubMed, EMBASE, and CINHALL. A total of 890 articles were found and after deduplication, title/abstract screening, and full text screening, two articles remained that fit the inclusion/exclusion criteria. Both articles showed that there was a significant difference between the time that men and women had received their prosthetic prescription from the healthcare team. Men received a prosthetic prescription faster than women did in both articles. Healthcare teams should use this information to increase their awareness of these discrepancies and work to improve prosthetic prescription rates across populations.

Supported by:

Primary Presenter / email: **Young, Hannah** / hey0226@uky.edu  
**Graduate Student**  
**Community Research**  
**Lower Limb Amputation**

Presentation **277**

Abstract Title: **Evaluating Stress Responses During Phone Calls Compared to Other Speaking Tasks**

Author(s): E. Renkert, Department of Rehabilitation and Health Sciences, U of Kentucky; B. Leslie, Department of Communication Sciences and Disorders, U of Kentucky; E. Ballard, Department of Communication Sciences and Disorders, U of Kentucky; K. Ishikawa, Department of Communication Sciences and Disorders, U of Kentucky

**Abstract:** Individuals with neurogenic voice disorders often report worsening symptoms during stressful situations, particularly phone calls. Current clinical evaluations typically rely on sentence reading and conversational speech tasks, conducted in non-stressful contexts, which may not fully capture the reported communication difficulties. This study evaluated whether phone calls induce greater stress than other speaking tasks. Ten adult females with no communication disorders completed four tasks: sentence reading, paragraph reading, storytelling, and a simulated phone call (i.e., leaving a voicemail). Stress was measured using heart rate monitoring and electrodermal activity (EDA). Phone calls elicited higher EDA responses than other tasks, indicating increased stress. Stress responses varied across participants, highlighting individual differences in stress sensitivity and coping strategies. These findings suggest that simulated phone calls may enhance clinical assessments by capturing real-world speech challenges in neurogenic voice disorders. Further research is needed in clinical populations.

Supported by: University of Kentucky College of Health Science Equipment Grant

Primary Presenter / email: **Renkert, Elisabeth** / [elisabeth.renkert@uky.edu](mailto:elisabeth.renkert@uky.edu)  
**Graduate Student**  
**Feasibility Study**



Presentation **278**

Abstract Title: **Differences in Gene Expression Profiles Between Male and Female Skeletal Muscle in Response to Mechanical Load**

Author(s): A.B. Sklivas, Department of Physical Therapy and Center for Muscle Biology, College of Health Sciences, U of Kentucky; Z.R. Hettinger, Center for Muscle Biology, College of Health Sciences, U of Kentucky; E.E. Dupont-Versteegden, Department of Physical Therapy and Center for Muscle Biology, College of Health Sciences, U of Kentucky

**Abstract:** Background: We have demonstrated differences in onset, progression, and recovery of muscle disuse atrophy in skeletal muscle of male and female rats. Hypothesis: we hypothesize that changes in gene expression are contributing to sex differences in mechanosensitive responses in male and female muscle. Methods: Adult F344/BN male and female rats (n=5) were randomly assigned to weightbearing (WB), 14 days hindlimb suspension (HS) or 7 days reambulation following HS (RA). RNA was isolated from soleus for bulk RNA sequencing and analysis. Raw transcriptional data were trimmed, aligned, and quantified using Partek Flow for differential analysis. Statistical analysis of differential gene expression was performed using DESeq2 within Partek. Gene ontology and pathway enrichment analysis were performed using Enrichr. Results: Analyses reveal that in female muscle genes regulating metabolic processes are higher and cellular structural components are lower in HS compared to WB, whereas in males genes involved in inflammatory processes are higher and those in mitochondrial function are lower with HS. Furthermore, in females demonstrate a reversal of the previously lower gene expression of cellular structural pathways with recovery from HS, while genes involved in the regulation of DNA transcription and intracellular signaling are lower. In male muscles genes related to extracellular matrix and metabolic function were higher in RA compared to HS, while those involved in ribosomal biogenesis and translational activity were lower. Conclusion: These data demonstrate important differences in the response of male and female muscle to mechanical stimuli related to disuse and recovery.

Supported by: Funding: NCCIH AT009268.

Primary Presenter / email: **Sklivas, Alexander** / absk225@uky.edu  
**Graduate Student**  
**Translational Research/Science**

**Presentation 279**

Abstract Title: **Targeting the Extracellular Matrix to Support Aged Muscle Hypertrophy**

Author(s): R. P. Wohlgenuth, Department of Athletic Training and Clinical Nutrition, U of Kentucky; A. R. Keeble, Department of Physiology, U of Kentucky; A. M. Owen, Department of Physical Therapy, U of Kentucky; N. T. Thomas, Department of Physiology, U of Kentucky; K. A. Murach, Department of Health, Human Performance and Recreation, U of Arkansas; C. S. Fry, Department of Athletic Training and Clinical Nutrition, U of Kentucky.

**Abstract:** With advancing age, the capacity for skeletal muscle to adapt is attenuated, limiting the ability of older adults to maintain muscle mass and strength. An essential component of this process is the remodeling of the extracellular matrix (ECM), which provides a scaffold for muscle growth and provides structural integrity. As organisms age, the muscle ECM becomes more cross-linked, which makes the matrix difficult to remodel and contributes to age-related declines in hypertrophy and strength. In adult and aged mice that underwent mechanical overload (MOV) of the plantaris, aged mice showed dampened increases in muscle mass and fiber cross-sectional area, but accentuated increases in collagen and pyridinoline cross-link contents compared to adult mice. Single cell RNA-sequencing revealed a unique population of POSTN+ cells from the fibro-adipogenic progenitor (FAP) lineage in both adult and aged plantaris muscles following MOV. The POSTN+ cells demonstrated unique, enriched expression of lysyl oxidase (Lox) with temporally exacerbated expression in aged muscle. We hypothesized that Lox-mediated collagen crosslinking is a critical barrier to efficient ECM remodeling and muscle growth in aged animals. We generated mice allowing for the conditional knockout of Lox in a temporal manner in POSTN+ cells (pLox-KO), and subjected pLox-KO and wild type (Lox-WT) aged mice to MOV. Following MOV, pLox-KO mice showed a reduction in elastic stiffness and cross-linked collagen that was associated with improved hypertrophic capacity compared to Lox-WT mice. These results suggest strategies to improve ECM composition and mechanics during MOV may help maintain or restore muscle plasticity with age.

Supported by: Start-up funds from the College of Health Sciences to C. S. Fry.

Primary Presenter / email: **Wohlgenuth, Ross** / rpwohlgenuth@uky.edu  
**Postdoctoral Scholar/Fellow**  
**Translational Research/Science**

**Presentation 280**

Abstract Title: **Adipogenic Commitment of Stem Cells and Fatty Degeneration in Skeletal Muscle after Knee Injury**

Author(s): S. Gonzalez-Velez, Department of Athletic Training and Clinical Nutrition (ATCN), University of Kentucky (UKY); A. R. Keeble, Department of ATCN, UKY; A. M. Owen, Department of Physical Therapy, UKY; N. T. Thomas, Department of ATCN, UKY; M. S. White, Department of Orthopaedics and Sports Medicine (OSM), UKY; D. L. Johnson, Department of OSM, UKY; A. V. Stone, Department of OSM, UKY; Y. Wen, Department of Physiology, UKY; B. Noehren, Department of OSM, UKY; C. S. Fry, Department of ATCN, UKY.

**Abstract:** Anterior cruciate ligament (ACL) tears are common knee injuries that result in unresolved quadriceps weakness and atrophy despite rehabilitation. The mechanisms responsible for this poor muscle recovery remain unknown; however, physical function deficits in skeletal muscle have been previously associated with an accumulation of intramuscular adipose tissue (IMAT). This deposition of adipose tissue between muscle fibers is mediated via the adipogenic differentiation of fibro-adipogenic progenitors (FAPs), which have the potential to adopt fibrogenic or adipogenic lineages. For this study, muscle biopsies were obtained from the injured and non-injured quadriceps of four young adults following ACL injury and reconstruction surgery (ACLR). The single nuclear transcriptome (snRNA-seq) of these samples was profiled to uncover FAP behavior as it affects muscle integrity during recovery. Additionally, Dixon Magnetic Resonance Imaging (MRI) analysis (n=9) and immunohistochemistry analyses were undertaken (n=16) to further assess IMAT deposition. snRNA-seq analysis and trajectory analysis revealed an increase in adipogenic commitment of FAPs after ACLR, denoted by the elevated abundance of FAPs from the injured leg that express adipogenic differentiation specific biomarkers. Interestingly, Dixon MRI and immunohistochemistry analyses showed no significant differences in IMAT abundance between the injured and the non-injured limb, indicating that the adipogenic transcriptome profile of FAPs does not directly translate to an increase in fat deposition within the muscle. ACL injury induces changes in FAP transcriptional profiles which are evidenced after one week of reconstruction surgery, but which are not associated with a concomitant accumulation of IMAT.

Supported by: This work was supported by NIAMS R01 AR072061 (CSF) and R01 AR071398 (BN).

Primary Presenter / email: **Gonzalez, Sara** / sgo287@uky.edu  
**Graduate Student**  
**Translational Research/Science**

**Presentation 281**

Abstract Title: **Psychological Impacts in Exercise Riders and Professional Jockeys Following Injury**

Author(s): K. Renner, Department of Kinesiology and Health Promotion, U of Kentucky; A. Samson, Department of Kinesiology and Health Promotion, U of Kentucky; M. Keener, Department of Athletic Training and Clinical Nutrition, U of Kentucky; M. Cormier, Department of Kinesiology and Health Promotion, U of Kentucky; K. Tumlin, Department of Athletic Training and Clinical Nutrition, U of Kentucky

**Abstract:** Past research provides evidence of the psychological toll following injury in well-known sports, but little research involves equestrian careers in horse racing, specifically involving athletes like professional jockeys and exercise riders. Despite equestrian sports being more dangerous than football, skiing, rugby, and motorcycle riding, there is little investigation of distress following injury in these populations (Ball et al., 2007). Mental health challenges within equestrian sports have continually been shrouded in silence, and the addition of injury can enhance psychological distress symptoms of depression, anxiety, stress, and self-esteem (King et al., 2022; Losty et al., 2019; McConn-Palfreyman et al., 2019). Due to this, there is an increased need to gather insight into the psychological impacts following injury in horse-based populations. The horse racing industry is not only a cornerstone of Kentucky's economy but also a vital part of its culture, with professional jockeys and exercise riders playing an essential role in the local communities and traditions that define the state. A comprehensive understanding of the psychological ramifications experienced by professional jockeys and exercise riders following injuries is paramount in addressing their holistic well-being and optimizing their recovery and performance success. This study aims to shed light on the often-overlooked mental health challenges faced by jockeys and exercise riders, ultimately fostering meaningful change and advocacy that enhances their well-being and ensures a safer, more supportive future for all involved in equestrian sports.

Supported by:

Primary Presenter / email: **Renner, Kelley** / [kelley.renner@uky.edu](mailto:kelley.renner@uky.edu)  
**Graduate Student**  
**Basic Research**  
**Behavioral Research**

**Presentation 282**

Abstract Title: **How a DASH Diet Integrative Review Shapes a Socio-Ecological Approach to Hypertension Control for African Americans**

Author(s): N. A. Sesay, Department of Communication, U of Kentucky; K. OoNorasak, Kentucky Maternal Morbidity and Mortality Task Force and Department of Kinesiology and Health Promotion, U of Kentucky; D. Haskins, Department of Dietetics and Human Nutrition, U of Kentucky; C. M. Robinson, UK Libraries, U. of Kentucky; B. M. White, Department of Health and Clinical Sciences, U of Kentucky

**Abstract:** Dietary Approaches to Stop Hypertension (DASH) has been proven to significantly reduce hypertension. African American (AA) adults have the highest hypertension rates of any race group. The Socio-Ecological Model (SEM) posits that intrapersonal, interpersonal, social, community, and policy factors affect health behavior. The food environment permeates all levels, from individual tastes to cultural norms that cultivate affinity to certain foods. AAs are reportedly less likely to adhere to DASH, emphasizing the importance of culturally responsive DASH recommendations to achieve hypertension control. We used an integrative review to assess whether DASH recipes are inclusive of traditional AA food (i.e., soul food). We reviewed databases MEDLINE via PubMed, CINAHL Complete via EBSCOHost, Clarivate's CAB Abstracts, Web of Science Core Collection, and the ProQuest Dissertations and Theses Index, EMBASE via Elsevier, and Google Scholar. We conducted a hand-search including but not limited to known journals and gray-literature. Eleven studies met inclusion criteria. Barriers to DASH adherence were food unfamiliarity, lack of variety, lack of necessary kitchen supplies/equipment, and stringent guidelines. Culture influenced the food choices of low-SES AAs. However, results were mixed. Some studies showed that AAs who used healthier DASH-compliant ingredient substitutions in soul food still perceived recipes to be culturally aligned. Others reported that baseline DASH is culturally acceptable, noting that not all AAs eat soul food regularly or at all. Findings indicate DASH recipes offer appeal as an effective strategy for AA hypertension control. A SEM approach to DASH-led hypertension control is warranted to incorporate multiple levels of influence.

Supported by: Research reported in this publication was supported by the National Library Of Medicine of the National Institutes of Health under Award Number G08LM014412. The content is solely the responsibility of the authors and does not necessarily represent the official views of the National Institutes of Health.

Primary Presenter / email: **Sesay, Nadia** / Nadia.Sesay@uky.edu  
**Graduate Student**  
**Health Equity Research**

**Presentation 283**

Abstract Title: **Can Men and Women Receiving Federal Food Assistance Afford to Follow the Dietary Approaches to Stop Hypertension?**

Author(s): Mansura S.B , Department of Pharmacology and Nutritional Science, U of Kentucky, B. M. White, Department of Health and Clinical Sciences, U of Kentucky, N. A. Sesay, Department of Communication, U of Kentucky, Emma Smith, Department of Health and Clinical Sciences, U of Kentucky, Jayden Brewer, Department of Health and Clinical Sciences, U of Kentucky, Taylor Emerson, Department of Health and Clinical Sciences, U of Kentucky, K. OoNorasak, U of Kentucky.

**Abstract:** Hypertension affects over half of American adults. Direct and indirect healthcare costs of hypertension were \$52.4 billion in 2019-2020 (2). The Dietary Approaches to Stop Hypertension (DASH) diet, with lifestyle changes, is a recommended approach to control blood pressure. (3). However, ability to afford foods necessary for the DASH diet among men and women receiving federal food assistance is unclear. Based on the National Heart, Lung, and Blood Institute one-week DASH eating plan, (4). in November 2024, the prices of each ingredient were searched online from two commonly used grocery store chains in southern U.S. cities and entered into the Fillet application to compute the grocery cost of one-week DASH plan. The November 2024 U.S. Thrifty Food Plan's average weekly federal food assistance allotment for men and women aged 20-50 years was compared to the total grocery costs of the one-week plan (1). According to the November 2024 Thrifty Plan, women in a single household will receive \$67.56 per week on average from the federal food assistance while men will receive \$84.6 (1). However, following the one-week DASH plan cost around \$68.55. This implies that men could afford to adopt the DASH diet while women cannot. Over four weeks, men and women would have received about \$338, and \$270.24 correspondingly, while the monthly DASH cost was estimated around \$290, leaving women short. Differences in federal food assistance allotments between men and women may result in the DASH diet adoption and nutritional inequities.

Supported by: Research reported in this publication was supported by the National Library Of Medicine of the National Institutes of Health under Award Number G08LM014412. The content is solely the responsibility of the authors and does not necessarily represent the official views of the National Institutes of Health.

Primary Presenter / email: **Shahad Bawa, Mansura** / msh380@uky.edu  
**Graduate Student**  
**Health Equity Research**

**Presentation 284**

Abstract Title: **Impact of Academics on Anxiety and Mental Health Needs of Undergraduate Students**

Author(s): Kelsey Haste, College of Health Science, University of Kentucky;  
Katie Goldey, PhD., College of Health Science, University of Kentucky

**Abstract:** Anxiety and mental health needs are increasing in prevalence among undergraduate students worldwide. Academics and mental health are inextricably linked, with academic stressors often cited as drivers of anxiety or depression, and anxiety or depression impacting academic performance. The purpose of this literature review was to explore the relationship between anxiety/depression and academics among undergraduate students. A search of the literature was conducted by both authors using the Academic Search Complete database. Inclusion criteria were: peer reviewed articles in English with a focus on undergraduate students, mental health, and academics and a publication year 2014-2024. Fourteen total articles were reviewed. Findings revealed consistent elements related to prevalence, impact, and exacerbating factors of anxiety and depression. Prevalence of depression and anxiety have increased dramatically among adolescents and undergraduates in recent years particularly since the COVID-19 pandemic. Undergraduate students with anxiety and depression experience lower academic engagement, performance, and retention rates. Exacerbating factors include academic stressors, excessive workloads, unhealthy habits, loneliness, and discrimination. Female students, LGBT students, and students who come from minoritized racial or ethnic backgrounds may be more likely to experience anxiety or depression possibly as a result of discrimination. Future research should explore the causes and exacerbating factors of anxiety and depression among undergraduate students as well as strategies for improving student outcomes and mental health. The authors of this review plan to further this research by exploring student perspectives on the relationship between pedagogical practices, academic stressors, and effective learning environments.

Supported by:

Primary Presenter / email: **Haste, Kelsey** / kelsey.haste@uky.edu  
**Undergraduate Student**  
**Basic Research**

**Presentation 285**

Abstract Title: **Looking at Accuracy and Speed Based on the Depth of an AAC Keyguard**

Author(s): E. Head, Communication Sciences and Disorders, U of Kentucky; J. L. Page, Communication Sciences and Disorders, U of Kentucky; M. J. Cooley Hidecker, Communication Sciences and Disorders, U of Kentucky; J. Kearns, Department of Education, U of Kentucky; G. Loizou, Communication Sciences and Disorders, U of Kentucky; E. Woodcock, Communication Sciences and Disorders, U of Kentucky; E. Doerr, Communication Sciences and Disorders, U of Kentucky

**Abstract:** Background and rationale for proposed research: Alternative and augmentative communication (AAC) is used by individuals who are unable to communicate effectively with all communication partners in all settings. Keyguards are used by patients with motor impairments to increase accuracy of AAC symbol selection. One characteristic of keyguards which could impact speed or accuracy of symbol selection is depth. Hypothesis: Keyguard depth will affect the speed and accuracy of communication messages. Methods: Participants included ten University of Kentucky college students who were at least 18, had self-reported functional hearing and vision, self-reported proficiency in spoken and written English as their primary language, and lacked AAC knowledge. Materials used were an iPad equipped with TDTalk, 3D printed keyguards at three depths (2mm, 3mm, 6mm), and cards with 9 printed sentences. Procedures: Participants were given the same 9 sentences on cards and asked to type them as quickly and accurately as possible on each of the four conditions (2mm, 3mm, 6mm, and no keyguard.) Sentence order and keyguard depth were counterbalanced to minimize order effect. Participants completed a social validation questionnaire ranking ease of use, frustration level, and perceived spelling accuracy. Data Analysis: speed and accuracy were determined from the recording. Inter-rater reliability was determined using letter by letter comparison. Results: An ANOVA did not reveal a statistically significant difference in errors across the four conditions,  $F= 0.78$ ,  $p= 0.5107$ , but did reveal a statistically significant difference in time across the four conditions,  $F= 67.0$ ,  $p= 0.0011$ .

Supported by: College of Health Sciences: 2024 undergraduate summer research award

Primary Presenter / email: **Head, Elizabeth** / eghe231@uky.edu  
**Undergraduate Student**  
**Basic Research**



**Presentation 286**

Abstract Title: **The Effect of Bacterial Endotoxins and Serotonin on Gastrointestinal Contractions**

Author(s): Katherine A. Neglia; Joy Bidros; Christine N. Haddad; Robin L. Cooper, Department of Biology, U of Kentucky

**Abstract:** The effect of endotoxins from resident and non-resident bacteria in the gastrointestinal (GI) tract on the physiology of the GI tract is an area that remains largely unexplored and is associated with diseases and disorders such as irritable bowel syndrome (IBS), Crohn's disease, and ulcerative colitis. Understanding the impact of bacterial endotoxins on the GI tract remains unknown. As a proof of concept, this research report serves to address this topic on the GI tract of crayfish. To investigate the effects of exposing the serosal side to bacterial endotoxins (lip,LPS), the amplitude and frequency of contractions were measured. To conduct this investigation, the GI tract was isolated and attached to a force transducer to measure longitudinal contractions before and during exposure to bacterial endotoxin of varied concentrations. Investigations are underway to explore if similar mechanisms of acute actions are utilized for LPS and serotonin. The preliminary results indicated that LPS and serotonin increased the frequency and force of contractions. This significant finding paves the way for exploring pharmacological approaches to modulate the effects of LPS on the GI tract from the serosal side.

Supported by: Chellgren Endowed Funding (R.L.C.). University of Kentucky, College of Arts and Sciences, Summer Fellowship (C.N.H.).

Primary Presenter / email: **Neglia, Katherine** / kane237@uky.edu  
**Undergraduate Student**  
**Basic Research**

Presentation **287**

Abstract Title: **Autoregressive Modeling of Dynamic Gait Stability in Anterior Cruciate Ligament Reconstruction Across Rehabilitation**

Author(s): C. Eisner, Department of Biosystems and Agricultural Engineering, U of Kentucky; B. Noehren, Department of Physical Therapy, U of Kentucky; M.K. Owen, Department of Physical Therapy, U of Kentucky

**Abstract:** Asymmetries in ground reaction forces (GRFs) persist years after anterior cruciate ligament reconstruction (ACLR), which may lead to increased risk of reinjury and long-term joint degeneration. Prior research has utilized autoregressive (AR) modeling to characterize gait instability finding ACLR individuals display dynamic gait instability compared to a control group at a single time point. The purpose of this study is to characterize the dynamic stability of running gait in ACLR individuals throughout late stages of rehabilitation. Twelve individuals (4F/8M, age: 20 years) participated in running gait analysis at 6- and 12-months post-ACLR. Participants ran at 3.0 m/s on a split-belt treadmill sampling at 2000 Hz. Data was filtered with a 4th order lowpass Butterworth filter at 35 Hz. Vertical GRF peaks were isolated, organized into a time series, and detrended. A second order AR model was fit to the time series data. Model coefficients and the stationary triangle were used to assess differences in stability between the two timepoints. Pairwise t-tests were performed on the AR1 and AR2 coefficients from the 6- and 12- month data collections: AR1 and AR2 coefficients were not significantly different between time-points (AR1:  $p = 0.26$ ; AR2:  $p = 0.77$ ). Because AR1 and AR2 coefficients are not significant, dynamic instability is a persistent issue both interlimb (AR1) and intralimb (AR2). Additionally, neither coefficient demonstrated consistent changes in value across timepoints. The clustering of both time points in the same region of the stationarity triangle may indicate underlying biomechanical deficits or compensation patterns.

Supported by: NIAMS R01 AR078316

Primary Presenter / email: **Eisner, Charlie** / ceeisner2@gmail.com  
**Undergraduate Student**  
**Clinical Research**

**Presentation 288**

Abstract Title: **Building the Appalachian Speech-in-Noise-Test**

Author(s): Annie Moffitt, Department of Communication Sciences and Disorders, U of Kentucky; Keiko Ishikawa, Department of Communication Sciences and Disorders, U of Kentucky

**Abstract:** Many children with various conditions can experience a speech perception impairment, which is when they cannot understand speech presented in noise. The standard diagnostic tool for impaired speech perception is the speech-in-noise (SPIN) test. However, there is no dialectally-sensitive clinical test to assess individuals who speak Appalachian English (AE). Many factors will determine if it is feasible to create a dialect-specific test. The purpose of this study was to analyze the differences in the acoustics of various sentences read in SAE versus AE. The study analyzed if talkers were able to vary in their ability to differentially produce SAE and AE, if speech rate will be slower in SAE compared to AE, and if the acoustic variations in target words between AE and SAE will predict listener's judgment. Different subjects from various Appalachian regions were recruited and asked to read sentence examples from a common SPIN test. Once the recordings were obtained, each sentence was split into its own audio file with a spectrogram for visualizing the speech signal. These individual files were then annotated to include the specific words from each sentence and the individual phonemes in each word. From this data, several conclusions were drawn. First, based on the auditory impression, the participants varied in their ability to switch between SAE and AE. The acoustic analysis revealed that there were significant differences in the fundamental frequency, intensity, and CPP between SE and AE. The acoustic variations are still being analyzed.

Supported by: UK Undergraduate Research Summer Research Fellowship Grant

Primary Presenter / email: **Moffitt, Annie** / [annie.moffitt@uky.edu](mailto:annie.moffitt@uky.edu)  
**Undergraduate Student**  
**Clinical Research**

**Presentation 289**

Abstract Title: **Assessing Clear Speech Implementation in Real-World Contexts**

Author(s): O. Stevens, Department of Communication Sciences and Disorders, U of Kentucky; O. Shields, Department of Communication Sciences and Disorders, U of Kentucky; K. Ishikawa, Departments of Communication Sciences and Disorders, U of Kentucky

**Abstract:** Clear speech is a common therapeutic technique for speech and voice disorders, but its use in real-world settings is under-explored. This study examined whether individuals can effectively apply clear speech in naturalistic contexts. Twelve adult college students with normal voice and speech completed two tasks: counting numbers while watching a highway driving simulation and describing Diapix pictures to elicit spontaneous speech. Speech rate and intensity were analyzed acoustically, and two native English speakers conducted auditory perceptual evaluations. Results showed significantly slower speech rates and higher intensity during clear speech across both tasks. Perceptual evaluations indicated that 75% of participants distinguished between habitual and clear speech in counting, and 83% did so in the DIAPIX task. Participants used different strategies, such as slowing speech or increasing loudness. These findings suggest that the experimental models effectively elicited clear speech, supporting their use in studying speech modification techniques in real-world scenarios.

Supported by: 2024 College of Health Sciences Undergraduate Summer Research Fellowship

Primary Presenter / email: **Stevens, Olivia** / [opst222@uky.edu](mailto:opst222@uky.edu)  
**Undergraduate Student**  
**Clinical Research**

**Presentation 290**

Abstract Title: **Examining the Relationship between Strength, Flexibility, Endurance & Knee Biomechanics during a Sissonne among Dancers**

Author(s): S. C. Kimura, Paul Laurence Dunbar High School; M. E. Arrington, Department of Athletic Training and Clinical Nutrition, U of Kentucky; N. R. Heebner, Department of Athletic Training and Clinical Nutrition, U of Kentucky; I. Patlan, Department of Athletic Training and Clinical Nutrition, U of Kentucky; M. C. Hoch, Department of Athletic Training and Clinical Nutrition, U of Kentucky; A. S. Bruce Leicht, Department of Athletic Training and Clinical Nutrition, U of Kentucky.

**Abstract:** A common compensation method for inefficient turnout in ballet dancers is dynamic knee valgus. When adolescent dancers perform high-impact exercises (e.g., jumping), excessive force may be placed on the medial aspect of the knee, increasing injury risk. We aimed to examine the relationship between strength, range of motion (ROM), core endurance, and knee biomechanics during the landing phase of a sissonne ouverte among collegiate ballet dancers.

Participants completed a series of lower extremity strength, ROM, and core endurance tests. Strength was measured using a handheld dynamometer. A weight-bearing lunge test and a goniometer were used to measure ROM. Core endurance was evaluated through an elbow plank with a laser pointer directed towards the center of a 1-inch by 1-inch reference square positioned on their greater trochanter. All measures were averaged across three trials and used for analysis. Participants were then instructed to start in the ballet fifth position and perform a sissonne ouverte, landing in an arabesque position on a force plate obtaining ground reaction forces (GRF). A camera was placed in the frontal plane to assess knee valgus angles during landing. Joint 2D kinematics and GRF were averaged across five trials and used for analysis.

It is expected that participants with better strength, ROM, and core endurance will produce less risky landing mechanics. These findings may aid dancers, physical therapists, and other dancer stakeholders in potentially determining whether dancers with certain strength, ROM, core endurance measures, and knee biomechanics may be at a greater risk for future injury.

Supported by:

Primary Presenter / email: **Kimura, Sena** / [sena.kimura@stu.fayette.kyschools.us](mailto:sena.kimura@stu.fayette.kyschools.us)  
**High School Student**  
**Clinical Research**

**Presentation 291**

Abstract Title: **Co-Designing a Smartphone-Based Navigation System for Cancer Patients in Bowling Green, KY**

Author(s): P. McCowan, College of Health Sciences, U of Kentucky; S. Perkins, College of Arts and Sciences, U of Kentucky; H. Sanjeevan, College of Arts and Sciences, U of Kentucky; E. Bloss, College of Health Sciences, U of Kentucky; E. Wilkins, College of Arts and Sciences, U of Kentucky; Ming-Yuan Chih, College of Health Sciences, U of Kentucky; J. Alexander, C. Stroebel, P. Hull, T. Mullett, Markey Cancer Center, U of Kentucky.

**Abstract:** Background: Kentucky ranks top among states for the worst cancer incidence and mortality, with significant barriers to needed services during cancer care. We are engaging community stakeholders to co-design a smartphone-based navigation system that provides cancer patients and their families with timely access to services within the communities to address cancer-related concerns. We will utilize recent stakeholder feedback to enhance the successful system adoption locally.

Methods: On December 16th, 2024, a co-design studio was conducted at the Med-Center Health in Bowling Green, KY. Four cancer patients, three family caregivers, three providers, one clinic manager, one patient navigator, and one community-based organization participated. Two activities include: 1) a hands-on exploration of the prototype patient app and its web-based navigator dashboard and 2) a demonstration of how the system functions in a clinical scenario. Ideas for improvement were collected. The meeting was audio-recorded and thematically coded. This study was approved by the Institutional Review Board.

Results: Several themes emerged from the activities. In Activity 1, providers emphasized medication inclusion, streamlined communication, user-friendliness, and access to patient information. Patients prioritized distress screening, resource usefulness, separate logins, and cancer education inclusion. In Activity 2, providers focused on communication and referral efficiency, while patients highlighted resource accessibility, simplicity, and reduction of barriers to resources. Overall, the feedback emphasized usability, effective communication, and resource accessibility, guiding refinements to meet the needs of patients and providers.

Conclusion:

The feedback from stakeholders ensures the program's acceptability and integration, and in turn will maximize its effects and adoption.

Supported by: The Merck Foundation and American Cancer Society

Primary Presenter / email: **Sanjeevan, Harry** / [harry.sanjeevan@uky.edu](mailto:harry.sanjeevan@uky.edu)  
**Undergraduate Student**  
**Community Research**

**Presentation 292**

Abstract Title: **Head Over Hoof: Concussion education and relationships to age and occupation in the horseracing industry**

Author(s): Landon Cord, Michaela Keener, PhD, MS, Department of Athletic Training and Clinical Nutrition, Gavin Vice, and Kimberly I Tumlin, PhD, MS, MPH, Department of Athletic Training and Clinical Nutrition and Center for Innovation in Population Health

**Abstract:** Introduction: Equestrian sports, such as horseracing, are the highest contributors to adult head traumas. Despite recent focus by the Horseracing Integrity and Safety Authority (HISA), educational impacts and relationships to age and occupation on concussion knowledge and attitudes (CKA) are lacking in horseracing. Purpose: We determined 1) relationships of age and occupational role in CKA; and 2) if younger individuals in horseracing with direct horse contact (HC) have greater CKA. Methods: An online survey was distributed through social media curated to individuals in horseracing. The survey consisted of 28 questions including demographics, occupation in the racing industry, prior concussion education (CE), and CKA. Responses were excluded if CE question was blank. Fisher's exact tests were used to analyze age and occupation on CKA and a Wilcoxon/Kruskal Wallis test for ranking confidence variables. Results: Of the 46 responses, those below 30 years (L30) tended ( $p=0.0606$ ) to not have CE, although those who had reported CE in school which was not jockey specific. Correct identification of anxious behaviors in others in L30 ( $p=0.0384$ ) was observed, those L30 in HC roles incorrectly identified low back pain ( $p=0.0040$ ) as CKA. L30 in HC roles tended to incorrectly identify extreme hunger ( $p=0.0695$ ) as CKA. Conclusion: Age and occupational role was a key factor in CKA within horseracing. Recognition of milder CKA which span emotional changes (irritability or anxiety) are more readily recognized in younger professionals who have had education; however, role-specific education may be relevant in ensuring CSA are applied across industry sectors.

Supported by: The project described was supported by the NIH National Center for Advancing Translational Sciences through grant number UL1TR001998. The content is solely the responsibility of the authors and does not necessarily represent the official views of the NIH

Primary Presenter / email: **Cord, Landon** / Landoncord15@gmail.com  
**Undergraduate Student**  
**Community Research**

**Presentation 293**

Abstract Title: **The Asymmetry Factor: Can combined driving sport help mitigate age-related declines in strength?**

Author(s): Anna Kidney, Gavin Vice, BS, Darin Vaughan, BS, Center for Innovation in Population Health, Michaela Keener, PhD, Department of Athletic Training and Clinical Nutrition, and Kimberly I. Tumlin, PhD, MS, MPH, Department of Athletic Training and Clinical Nutrition and Center for Innovation in Population Health

**Abstract:** Introduction: Combined driving is a skillful equestrian sport relying on upper body strength to control and navigate the horse and carriage through complex courses. Studies have shown age-related declines in shoulder strength (SS) and range of motion (ROM), but none have specifically investigated competitive combined drivers (CCD).

Purpose: We aimed to 1) determine the relationship of SS and ROM with age and sex in CCD; and 2) characterize relationships between age and sex on bilateral asymmetries (ASY).

Methods: In June 2024, 11 CCD (aged 51±14; n=4 males) participated in performance testing using the VALD DynaMo system. Upper extremity strength tests included scaption and handgrip; ROM included flexion, external rotation, and internal rotation. A multiple linear regression model assessed the effects of sex, age, and ASY on SS and ROM.

Results: Age tended to weakly negatively affect grip strength ( $p=0.093$ ). Although males had 3.32 units higher ASY, neither age, sex, nor ASY were significant predictors of ROM, except grip strength, where sex approached significance (males -9.2kg;  $p=0.052$ ). Grip strength (adj.  $R^2 = 0.242$ ) and scaption (adj.  $R^2 = 0.233$ ) explained SS symmetries.

Conclusion: Even though there was a small sample of male CCD we still observed variation in upper extremity strength. With the sport being heavily dominated by an older population and all sexes competing equally, understanding the relationships between aging and ASY can help CCD performance. Furthermore, considering activities CCD do to build strength and ROM may inform other physical activity programs for aging populations.

Supported by:

Primary Presenter / email: **Kidney, Anna** / amki266@uky.edu  
**Undergraduate Student**  
**Community Research**



**Presentation 294**

Abstract Title: **Precision Under Pressure: Jockey's Reaction Accuracy in Competition**

Author(s): Mazie Knight, Neyati Patel, Kimberly Tumlin, PhD, MPH, Department of Athletic Training and Clinical Nutrition, and Michaela Keener, PhD, Department of Athletic Training and Clinical Nutrition

**Abstract:** Introduction: Jockeys rely on quick reaction time (RT) and accuracy (RA) to safely maneuver their horse around the track at speeds between 30-45 mph. Their demanding workday habits (WDH), including long hours and riding multiple horses daily, may negatively impact their RA.

Purpose: Evaluate the relationship of jockey WDH on RA. We hypothesize RA will decrease with less sleep, higher caffeine consumption, more horses exercised, and more races ridden.

Methods: Jockeys completed a WDH survey, familiarization trial, and a 60s RT test on the Dynavision Board while maintaining their racing position on an unstable surface. RA is the ratio of lights hit to total lights illuminated, divided evenly into quadrants. Data analysis included Spearman correlations, general linear models, and paired t-tests.

Results: Thirty-six jockeys (4 females,  $36.8 \pm 9.8y$ ) participated. RA did not differ between quadrants. There were no significant relationships between RA and WDH except races ridden. Jockeys who raced prior to testing had 10.3% higher ( $p=0.03$ ) RA in the lower right (LR) quadrant than those who had not raced.

Conclusion: Sleep and caffeine consumption did not affect RA, likely because jockeys have adapted to their long work hours and job demands. The differences in RA in the LR quadrant between jockeys who had raced versus those who had not could be due to their habit of looking to their right-side mid-race to evaluate their ability to move around horses safely and effectively. Future research should evaluate peripheral RT and RA in more depth.

Supported by: The project described was supported by the NIH National Center for Advancing Translational Sciences through grant number UL1TR001998. The content is solely the responsibility of the authors and does not necessarily represent the official views of the NIH.

Primary Presenter / email: **Knight, Mazie** / [emkn233@uky.edu](mailto:emkn233@uky.edu)  
**Undergraduate Student**  
**Community Research**

Presentation **295**

Abstract Title: **Hold Your Horses: Evaluating Visuomotor Reaction Times in Combined Drivers**

Author(s): M. Keener, Department of Athletic Training and Clinical Nutrition, U of Kentucky; K. Tumlin, Department of Athletic Training and Clinical Nutrition, U of Kentucky

**Abstract:** Introduction: Combined drivers rely on quick visuomotor reaction time (RT) to navigate a horse-drawn carriage through three phases: dressage, marathon and cones. Simple RT (SimpRT) is the time to respond to a visual stimulus, while choice RT (ChoiceRT) adds a decision-making element. Drivers must distinguish relevant cues from distractions to keep themselves and their horse safe during competition.  
Purpose: To analyze SimpRT and ChoiceRT in drivers. We hypothesize that 1) SimpRT will be significantly faster than ChoiceRT, and 2) peripheral RT will be slower than central RT in both RT conditions.  
Methods: Participants completed a novel RT assessment with 10 FitLights sensors in a horseshoe pattern while seated on an unstable surface. After familiarization, they did a 60-second SimpRT test, hitting each blue light as quickly as it appeared. This was followed by a 60-second ChoiceRT test, where they hit only blue lights while ignoring red ones. The lights cutoff at 0.85s for both testing conditions. Paired t-tests and correlation analyses were conducted.  
Results: Fourteen drivers (11 females, 49.2±18.4y) participated. There was no significant ( $p=0.11$ ) difference between SimpRT (0.61±0.10s) and ChoiceRT (0.63±0.10s). There were no significant ( $p>0.05$ ) differences between central and peripheral RT bilaterally for either RT condition.  
Conclusion: The similarity in SimpRT and ChoiceRT may stem from drivers' rapid decision-making skills. The lack of difference in central versus peripheral RT suggests that drivers use a wide visual field, continuously scanning their horses and the course to maintain performance and safety. Future research should explore RT in real-world driving scenarios.

Supported by: The project described was supported by the NIH National Center for Advancing Translational Sciences through grant number UL1TR001998. The content is solely the responsibility of the authors and does not necessarily represent the official views of the NIH

Primary Presenter / email: **Patel, Neyati** / [ngpa227@uky.edu](mailto:ngpa227@uky.edu)  
**Undergraduate Student**  
**Community Research**

**Presentation 296**

Abstract Title: **Recommendations from an ECHO in Augmentative and Alternative Communication (AAC): An Implementation-based Analysis**

Author(s): M. Ritchie, Department of Communication Sciences and Disorders, U of Kentucky; E. Doerr, Department of Communication and Sciences Disorders, U of Kentucky; M. J. Cooley Hidecker, Department of Communication Sciences and Disorders, U of Kentucky; J. Page, Department of Communication Sciences and Disorders, U of Kentucky; J. Kearns, Human Development Institute, U of Kentucky

**Abstract:** Background: Project ECHO (Extension for Community Healthcare Outcomes) was first developed in New Mexico and was originally intended to link experts working in academic medical centers to local clinicians. An interprofessional team at the University of Kentucky adapted the ECHO model to provide school professionals with education on augmentative and alternative communication (AAC) use with their students. The ECHO team includes experts in special education, speech-language pathology, audiology, visual impairment, physical therapy, occupational therapy, and peer mentoring. The team provides a brief training on AAC use, and participants present a deidentified student case looking for next steps in AAC intervention. The ECHO team and participants provide suggestions during the ECHO session that are sent out in a written report following each session.

Goal of Research: This research analyzed the suggestions in 41 written ECHO reports from spring 2021 through spring 2024 sessions.

Hypothesis: The ECHO team will have provided interprofessional suggestions regarding AAC intervention in the following areas:

Educational practices; Hearing; Vision; Sensory issues; Motor issues; Behavior/Relationships; Communication

Methods: Each suggestion was categorized by its subject area through Microsoft Excel software. We then calculated descriptive statistics using the Pivot Table feature in Excel, including the total number of suggestions overall and for each category, the average number per semester, and the range from each semester based on 41 ECHO reports. There were 5-6 case presentations per semester.

Results: The total number of suggestions was 767, and the average for each semester was 105 with a range of 69 to 147. The communication category was the most represented with 480 suggestions, but each discipline was represented.

Supported by:

Primary Presenter / email: **Ritchie, Maddie** / [mgri230@uky.edu](mailto:mgri230@uky.edu)  
**Undergraduate Student**  
**Dissemination & Implementation Research**

Presentation **297**

Abstract Title: **Cultural Factors and Their Impact on the Diagnosis of Disordered Eating in Rural Populations**

Author(s): A. D. Glass, Department of Human Health Sciences, U of Kentucky; S. R. Irving, Department of Physician Assistant Studies, U of Kentucky

**Abstract:** Background: Eating disorders are complicated illnesses that are becoming increasingly prevalent in the United States. Research has examined individual risk factors for disordered eating; however, evidence suggests that cultural factors could influence the diagnosis of disordered eating in rural populations. This literature review seeks to answer the question: Does culture impact the diagnosis of disordered eating in rural populations?

Methods: Free searchable bibliographic databases were used to search for keywords related to eating disorders and rural populations. Using the defined inclusion criteria of medically underserved or rural populations and cultural factors of eating disorders. Studies were excluded if they did not focus on disordered eating or cultural insights. Studies were grouped into the following themes: cultural norms/perceptions, diagnostic tools and criteria, provider bias/training, access and stigma to care.

Results: Underserved patient populations carry a higher burden of chronic conditions and culture has long been identified as a contributor to the development of eating disorders. This literature review reveals that gaps in provider training, lack of patient education, and cultural biases contribute to the under-diagnosis of eating disorders in rural patient populations.

Conclusion: To address the under-diagnosis of eating disorders, future research should focus on increasing the cultural competency of providers. Specifically, through closing gaps in provider training, development of patient education materials, and focused screening and treatment programs for rural communities.

Supported by:

Primary Presenter / email: **Glass, Autumn** / [adgl224@uky.edu](mailto:adgl224@uky.edu)  
**Undergraduate Student**  
**Literature Review**

**Presentation 298**

Abstract Title: **Rural Roots, Rural Practice: Exploring the Influence of Geographic Background on Physician Assistant Career Preferences**

Author(s): H. Anderson, Department of Physician Assistant Studies, U of Kentucky; D. Potter, Departments of Physician Assistant Studies and Physical Therapy, U of Kentucky; S. Irving, Department of Physician Assistant Studies, U of Kentucky

**Abstract:** Physician Assistant (PA) programs seek to meet the needs of their communities by training excellent PAs ready to practice in all practice settings. In rural states like Kentucky, limited access to care remains a critical concern, particularly in Health Professional Shortage Areas (HPSAs), where clinicians are in high demand to address healthcare disparities. This study examines associations between PA student background, specifically rural vs urban, and desirability of areas of practice upon graduation. Using data from the 2021 PAEA Matriculating Student Survey (MSS) and End of Program Survey (EOPS), we explore how rural upbringing influences practice preferences. For this study, rural background is defined as residing in a non-metropolitan area (population < 50,000). PA students from rural backgrounds reported lower expected salaries at graduation, a stronger preference for rural practice, lower interest in urban settings, and a higher desire to enter pediatric specialties. These findings may inform targeted recruitment strategies and curriculum development to encourage rural practice.

Supported by:

Primary Presenter / email: **Anderson, Hannah** / hannah.anderson1@uky.edu  
**Faculty**  
**Health Equity Research**

**Presentation 299**

Abstract Title: **Benefits of Using Adaptive Cycling for Adults with Lifelong Disabilities: A Systematic Review**

Author(s): H. Turner, Department of Physical Therapy, U of Kentucky; S. Turner, Department of Physical Therapy, U of Kentucky, L. Wiggins, Department of Physical Therapy, U of Kentucky; K. Metzler-Wilson, Department of Physical Therapy, U of Kentucky; C. Gohrband, Department of Physical Therapy, U of Kentucky

**Abstract:** Purpose: The primary aim of this systematic review was to demonstrate what evidence is available to support the use of cycling in adults with disabilities and the need for continued research to support this population to increase their participation in physical activity.

Design/Methods: A systematic review of the literature was completed to find relevant information on the benefits of cycling for adults with lifelong disabilities. MEDLINE, CINAHL, SCOPUS, AMBUCS, and Google Scholar databases were searched. Of the 782 articles searched, 13 articles were included for the qualitative and qualitative analysis.

Results: The results of this systematic review highlight the positive impacts of cycling on cardiovascular endurance, lower extremity strength, and functional status in adults with life-long disabilities. Correlations showed an increase in participation and improved quality of life for those with life-long disabilities.

Conclusion: Physical activity participation is a large indicator of improved quality of life and health. Adults with lifelong disabilities such as Cerebral Palsy and Down Syndrome have significant limitations in participating in exercise due to decreased cardiovascular endurance.

Clinical Relevance: There are benefits to cycling in adults with lifelong disabilities due to the increase in their ability to participate in physical activity, reducing sedentary lifestyle, and improving their overall mental and physical health. There is a variety of research available on this topic for children, but these children are living into adulthood and there is a lack of literature to demonstrate the importance of cycling in adults with disabilities.

Supported by:

Primary Presenter / email: **Gohrband, Catherine** / [clgo223@uky.edu](mailto:clgo223@uky.edu)  
**Faculty**  
**Health Equity Research**

**Presentation 300**

Abstract Title: **Altered Collagen 1 Dynamics during Post-sepsis Skeletal Muscle Dysfunction**

Author(s): O. Granada-Correa, U of Kentucky; A.R. Keeble, U of Kentucky; A.S. Ritchey, U of Kentucky; N.T. Thomas, U of Kentucky; Z.T. Bates, U of Kentucky; C.S. Fry, U of Kentucky; A.M. Owen, U of Kentucky

**Abstract:** Sepsis survivors often suffer from chronic muscle weakness, which significantly impacts quality of life and independence. Despite growing attention, current strategies fail to restore muscle strength. Cursory reports indicate possible alterations in the extracellular matrix (ECM) during sepsis, but remains largely unexplored. Thus, collagen 1, the predominant collagen isoform which contributes to skeletal muscle fibrosis, was investigated in a murine sepsis model to understand its potential role in post-sepsis muscle weakness. A cecal slurry model of polymicrobial sepsis with therapeutic resuscitation (physiological saline s.c., 1.5mg/mouse imipenem i.p.) was employed in late-middle-aged (16-18 month old) Collagen 1 eGFP transgenic mice. Strength was assessed using in vivo dorsiflexor torque and the plantaris was preserved for immunohistochemical assessment. In vivo contractile functional analysis confirmed successful recapitulation of long-term muscle weakness in the sepsis surviving collagen 1 eGFP transgenic mice. We observed a step-wise increase in collagen 1+ cells, with >twofold more at 14-days compared to controls ( $p < 0.05$ ). Transcriptomic analysis of collagen 1+ cells revealed upregulation of Positive Regulation of Transforming Growth Factor Beta Receptor Signaling Pathway (GO:0030511). Macrophage abundance (F4/80+ cells) was >sixfold higher in sepsis survivors' muscles ( $p < 0.05$ ), suggesting possible immune cell involvement. Taken together, these results indicate that sepsis survivors experience altered collagen 1 dynamics, possibly driven by macrophages promoting TGF $\beta$  signaling. Further exploration of the temporal changes and pathways involved in collagen remodeling post-sepsis could reveal novel therapeutic targets to aid muscle recovery and improve functional outcomes.

Supported by: Pilot funding from the College of Health Sciences Office of Research Support

Primary Presenter / email: **Owen, Allison** / allison.owen@uky.edu  
**Faculty**  
**Basic Research**

**Presentation 301**

Abstract Title: **What is Normal to Expect for Someone with Normal Pressure Hydrocephaly?**

Author(s): K. Lee, Department of Physical Therapy, U of Kentucky.

**Abstract:** The diagnosis of NPH is one of exclusion – what is it NOT – until you consider that Hakim's Triad indicates NPH, but the lumbar drain trial results are the key to making a diagnosis. Clinicians have to be careful that they are extracting information that can be remeasured, as well as information that can exclude issues such as frontotemporal dementias, generalized dementias, or Parkinson's spectrum disorders. These can co-exist with NPH, so teasing out the cause of the classic magnetic gait – sometimes only at the shuffling stage – and the frequent falls is important. Checking for vestibular issues is also important. The concurrent issues of cognition and balance can make it challenging to extract precise information, so clinicians have to be careful to triangulate what they see with patient report and the outside input of caregivers/family members.

Supported by:

Primary Presenter / email: **Lee, Kara / kara.lee@uky.edu**  
**Faculty**  
**Clinical Research**



**Presentation 302**

Abstract Title: **Examining influence of clinical setting type on first clinical performance through use of standardized methodology**

Author(s): Patrick Pabian, Department of Physical Therapy, U of Kentucky; Yuyan Xia, Department of Physical Therapy/ Department of Physician Assistant Studies, U of Kentucky

**Abstract:** Standardization of clinical education placements remains a critical challenge in healthcare education, particularly during students' first clinical experiences—a crucial stage in professional development. This study addresses the challenge of standardizing initial clinical education placements for first-year physical therapy (PT) students, focusing on how different clinical environments impact skill development. Researchers analyzed 60 PT students from a southern U.S. university, employing stacked Rasch modeling to validate two performance scales: a 5-item professional skills scale and a 12-item patient management skills scale. Data from midterm and final clinical evaluations were merged to assess competency growth, while independent t-tests compared outcomes across outpatient (45 students) and acute care (10 students) settings.

Rasch analysis confirmed strong model-data fit, with all items demonstrating high psychometric quality. A significant discrepancy emerged between raw scores (Mean=1.6, SD=1.10) and Rasch-adjusted measure scores (Mean=2.97, SD=2.30), with paired t-tests revealing statistically superior sensitivity in Rasch-calibrated scores ( $p < 0.001$ ). This underscores the model's utility in refining skill assessment accuracy. Contrary to expectations, independent t-tests showed no significant difference in skill development between outpatient and acute care settings ( $p = 0.331$ ), suggesting clinical environment type does not substantially influence early competency acquisition.

The findings support flexible placement strategies without compromising educational outcomes. Methodologically, the study advances PT education research by validating Rasch-based scales as robust tools for evaluating clinical competencies, addressing prior limitations in raw score interpretation. Practically, it reassures clinical educators that varied first-year placements can effectively nurture professional and patient management skills. Future research should explore longitudinal impact.

Supported by:

Primary Presenter / email: **Pabian, Patrick** / Patrick.pabian@uky.edu  
**Faculty**  
**Clinical Research**

**Presentation 303**

Abstract Title: **Examining Comorbid Conditions in College Students Diagnosed with ADHD pre- vs. post-COVID**

Author(s): C. Arena, University Health Service, U of Kentucky; C. E. Vanderford, Department of Physician Assistant Studies, U of Kentucky; D. Potter, Department of Physician Assistant Studies, U of Kentucky; I. LaRrett, University Health Service, U of Kentucky; M. Neltner, University Health Service, U of Kentucky; C. Markham-Abedi, Mental Health Service, Lexington Veterans Affairs Healthcare System

**Abstract:** ADHD is a neurodevelopmental disorder that challenges college students' academic performance and well-being. The stability of ADHD symptoms often relies on structured routines and access to support, both of which were significantly disrupted by the COVID-19 Pandemic. These disruptions heightened stress levels and exacerbated comorbid conditions, such as anxiety, depression and substance use, further complicating the diagnosis and management of ADHD in the college population.

This study investigates ADHD diagnoses in a college student population, focusing on variations across gender, ethnicity, and psychiatric comorbidities, while examining the influence of the pandemic on diagnostic trends. The investigators analyzed student health records from a public university, comparing trends in ADHD and related conditions before, during and after the COVID-19 Pandemic.

The diagnostic prevalence of ADHD rates in this population post-COVID-19 pandemic rose significantly. Additionally, conditions such as anxiety, depression, and substance use became more common following the pandemic, adding complexity to management of students with ADHD. Diagnostic tools such as the QbTest, though valuable, face limitations, particularly in populations with cannabis use.

This study underscores the need to address gaps in care and improve diagnostic practices in the future. Findings aim to guide medical and mental health clinicians and inform strategies to enhance mental health support for college students.

Supported by: The project described was supported by the NIH National Center for Advancing Translational Sciences through grant number UL1TR001998. The content is solely the responsibility of the authors and does not necessarily represent the official views of the NIH.

Primary Presenter / email: **Arena, Cori** / cearen2@uky.edu  
**Clinical Research**

**Presentation 304**

Abstract Title: **Utilization of Social Media as a Pedagogical Tool to Enhance Physician Assistant Student Learning of Psychiatry**

Author(s): C.E. Vanderford, Department of Physician Assistant Studies, U of Kentucky; Y. Xia, Department of Physician Assistant Studies, U of Kentucky

**Abstract:** Objective: To examine Physician Assistant (PA) student attitudes on the utilization of social media as a pedagogical tool to enhance learning of symptomology of psychiatric diagnoses.

Methods: This study analyzed responses from 52 PA students' responses to four questions within an assignment in a didactic psychiatry course. Students were tasked to choose five psychiatric diagnoses, locate a form of social media depicting the diagnosis, and reflect upon: 1) insights gained, 2) how psychiatric interviews vary across the lifespan, 3) communication tools that can be utilized in practice, and 4) the influence of this assignment on the student's understanding of the diagnosis.

The methodology combines sentiment analysis using NLTK's VADER algorithm (measuring positive, negative, neutral, and compound sentiments) with thematic analysis using SpaCy's natural language processing.

Results: Analysis of the four questions revealed significant insights into students' learning experiences and understanding of psychiatric assessments. PA students' attitudes toward social media utilization were generally positive. Students developed enhanced understanding of psychiatric disorders, improved recognition of age-appropriate interview techniques, and gained practical communication tools for clinical practice.

Conclusions: Social media is an effective pedagogical tool to utilize in the classroom. The high frequency of media-related terms and positive sentiment scores suggest that using media examples effectively bridged theoretical knowledge with practical application. The balanced sentiment in diagnostic understanding indicates development of critical thinking skills and recognition of the complexity in mental health presentations. Future educational approaches should continue to integrate similar media-based learning experiences to enhance student engagement and understanding in psychiatric education.

Supported by:

Primary Presenter / email: **Vanderford, Cheryl** / [cheryl.vanderford@uky.edu](mailto:cheryl.vanderford@uky.edu)  
**Faculty**  
**Scholarship of Teaching & Learning**

**Presentation 305**

Abstract Title: **What makes a great differential? A mixed methods descriptive analysis**

Author(s): R. Hunton, Department of Physician Assistant Studies, U of Kentucky; D. Potter, Department of Physician Assistant Studies, U of Kentucky; K. Schuer, Department of Physician Assistant Studies, U of Kentucky

**Abstract:** Purpose: The differential diagnosis is a list of plausible diagnostic hypotheses for a particular case scenario. The purpose of this study was to better understand mastery in differential diagnosis ability. Methods: This cross-sectional study was part of a larger prospective longitudinal descriptive study (IRB protocol # 92786), under the title The Differential Diagnosis Project. The instrument was a survey sent to a reference panel of expert clinicians specializing in emergency and internal medicine. Each participant was instructed to provide a prioritized list of up to ten diagnoses based on each vignette, and each was asked an open-ended question, "Based on your clinical experience and previous responses, what elements make a great differential diagnosis?" Results: The average expert experience was 15.44 years (SD 13.2, IQR 6 – 20). For vignette 1 (chief complaint: headache), 6 of 9 experts agreed on the top slot diagnosis. For vignette 2 (chief complaint: chest pain), 8 of 9 experts agreed on the top slot diagnosis. For vignette 3 (chief complaint: abdominal pain), 8 of 9 experts agreed on the top slot diagnosis. Experts had an average of 6.8 differential items per vignette (2.7, 5–9.5). On average, the expert panel took 114 seconds (1 minute and 54 seconds) per vignette (85, 51.8–148.3) to develop their differential, and they took 340 seconds (5 minutes and 40 seconds) for all vignettes (152, 229.1–448.9). Word frequency analysis demonstrated that "likely" was mentioned four times, "emergent" two times, "atypical" two times, and "broad" two times. Possibility was the predominant concept in the responses. Conclusion: Differential diagnosis is central within the clinical reasoning process. Experts had nearly seven differential items per vignette and completed this task quickly, supporting system 1 processing. Experts described similar elements in what makes a great differential list. Researchers can use these findings to assess large language models.

Supported by:

Primary Presenter / email: **Hunton, Ryan / rwhu225@uky.edu**  
**Faculty**  
**Scholarship of Teaching & Learning**

Presentation 306

Abstract Title: **Social Capital and Academic Achievement within Undergraduate Learning Communities:  
A Network Analysis**

Author(s): L.N. Woltenberg, Department of Physician Assistant Studies, College of Health Sciences, U of Kentucky; A. Joseph, U of Kentucky, College of Agriculture, Food, and Environment, U of Kentucky

**Abstract:** This study investigates the relationship between student roles within a residential peer community and outcomes such as self-reported academic achievement and personal satisfaction during the first year of college. Using social network analysis and a mixed-methods approach framed by the community of practice theory, the research examines how peer relationships and social capital influence learning and personal growth within a living-learning community.

The findings revealed that while individual popularity, relational ties to staff, and being a sought-after source of advice were not significant predictors of higher GPA, the network demonstrated strong density, cohesion, and structural properties conducive to social capital flow. The community effectively fostered familiarity, friendships, and collaborative knowledge-building among participants and staff. This environment supported students in transitioning from dependence on external authority to self-authorship, enabling more complex levels of meaning-making.

The results confirm that the primary objectives of a learning community—developing a network of friends and reaping social and academic benefits—were achieved. This study contributes to the broader literature on learning communities by addressing a critical gap: understanding the dynamics within these communities and their impact on individual and collective development. These findings highlight the importance of fostering rich, relationally supportive environments to enhance student engagement and transformational learning experiences.

Supported by:

Primary Presenter / email: **Woltenberg, Leslie** / [leslie.woltenberg@uky.edu](mailto:leslie.woltenberg@uky.edu)  
**Faculty**  
**Scholarship of Teaching & Learning**

**Presentation 307**

Abstract Title: **Comparing Student Self-Identified Rural Identity with Federal Definitions of Rurality**

Author(s): H.L. Witt, Department of Physical Therapy, Rehabilitation and Health Sciences PhD Program, U of Kentucky; J. Adkins, College of Health Sciences, U of Kentucky; N. Metzger, College of Health Sciences, U of Kentucky; R. A. Carper, Department of Physical Therapy, U of Kentucky.

**Abstract:** Introduction: Rural identity plays a critical role in shaping perceptions of rural healthcare. This study explores the congruence between students' self-identified rurality and federal definitions of rurality, highlighting the inconsistencies and complexities among various classification systems. As part of a larger project examining the relationship between rural identity and perceptions of rural healthcare, this research focuses on how students perceive their upbringing and how these perceptions align—or conflict—with federal definitions. Methods: Sixty-five first-year physical therapy students completed a 16-question survey, which included their self-identified community types (primarily urban, suburban, rural or a mixture) and the primary ZIP code of where they grew up, if applicable. The ZIP codes were analyzed using rural designations from the Office of Management and Budget (OMB), Health Resources and Services Administration (HRSA), U.S. Census Bureau, National Center for Education Statistics (NCES), Department of Veterans Affairs (VA), and Department of Agriculture (USDA). Results: Preliminary findings suggest significant variation between self-identified rurality and federal classifications, underscoring the subjective nature of rural identity and the discrepancies across definitions. These inconsistencies reveal the "messiness" of rural designations, which can complicate research, policy development, and resource allocation. Conclusion: This study contributes to a broader understanding of rural identity and its implications, emphasizing the need for greater alignment and clarity in how rurality is defined and applied in both academic and policy contexts.

Supported by:

Primary Presenter / email: **Witt, Heather** / Heather.Witt@uky.edu  
**Graduate Student**  
**Scholarship of Teaching & Learning**

**Presentation 308**

Abstract Title: **Physician Assistant Student Attitudes Toward the Utilization of AI to Enhance Psychiatry Skill Development**

Author(s): Y. Xia, Department of Physician Assistant Studies, U of Kentucky; C. E. Vanderford, Department of Physician Assistant Studies, U of Kentucky

**Abstract:** Objective: To examine Physician Assistant (PA) student attitudes on the utilization of artificial intelligence (AI) in learning psychiatric diagnoses.

Methods: This study analyzed responses from 50 PA students' responses to five questions within an assignment within a didactic psychiatry course. The questions focused on their experience using ChatGPT for psychiatric clinical skill development, utilizing sentiment analysis (measuring positive, negative, and neutral sentiments) and theme frequency analysis to evaluate the effectiveness of AI-assisted learning in psychiatric education.

Results: A clear pattern of educational growth and increased clinical confidence through the AI-assisted learning experience was shown. Students showed significant improvement in their confidence levels for both diagnosis (Compound: 0.41) and treatment planning (Compound: 0.57), with notably positive sentiment trends across responses. The use of ChatGPT as a learning tool proved largely successful (Compound: 0.59 for positive experiences), despite some technical limitations. Students particularly valued the low-stakes practice environment, which allowed them to develop clinical skills without the pressure of real patient interactions. The high frequency of themes related to patient interaction, symptoms, and diagnostic processes across all questions indicates a strong focus on practical clinical skill development.

Conclusions: Research on the utilization of Artificial intelligence in the classroom suggests that while AI-based practice cannot fully replace real patient interactions, it serves as a valuable supplementary tool for developing foundational clinical skills and building professional confidence in psychiatric care.

Supported by:

Primary Presenter / email: **Xia, Yuyan** / [yuyan.xia@uky.edu](mailto:yuyan.xia@uky.edu)  
**Postdoctoral Scholar/Fellow**  
**Scholarship of Teaching & Learning**

**Presentation 309**

**Abstract Title: Covid-19 Vaccine Uptake and Vaccination Attitudes by Age and Gender**

**Author(s):** M. Adamski, College of Nursing, U. of Kentucky; J. Hunter, School of Human Environmental Sciences, U. of Kentucky; G. Mudd-Martin, College of Nursing, U. of Kentucky

**Abstract:** Background: Identifying characteristics associated with vaccine uptake and attitudes towards vaccination can guide public health efforts, especially during critical times such as the Covid-19 pandemic. Objective: To examine age and gender differences in Covid-19 vaccine uptake and attitudes toward vaccine uptake.

**Methods:** As part of a CDC program led by the University of Florida, eight CCTS Community Engagement Cores collaborated with Cooperative Extension and community organizations to conduct a survey to assess Covid-19 vaccine uptake and attitudes toward uptake. For this study, data from 527 Kentucky respondents (age 46.39±15.07 years; 70% female) were analyzed. Descriptive analyses were used to assess age and gender variations in vaccine uptake and attitudes.

**Results:** Covid-19 vaccine uptake increased with each approximate 20-year increase in age. Vaccination was lowest among respondents aged 18-39 years (79.3%) and highest among those ≥60 years (95.4%). Similarly, 41.6% of respondents in the youngest age group reported getting vaccinated as soon as possible whereas 46.6% reported waiting to see outcomes in those already vaccinated. Comparatively, 66.3% of respondents in the oldest age group were vaccinated as soon as possible and only 28.4% waited. While 86.1% of women and 84.1% of men reported being vaccinated, a higher percentage of women than men reported being vaccinated as soon as possible (50.2% and 44.4%, respectively).

**Conclusion:** While most respondents reported receiving the Covid-19 vaccine, a higher percentage of older compared to younger respondents reported being vaccinated. Future public health messages focused on younger populations may be needed to increase uptake in this group.

**Supported by:** CDC-RFA-IP21-2113-NU21IP000597; NIH/NCATS UL1TR001998

**Primary Presenter / email:** **Adamski, Mia** / mad240@uky.edu  
**Undergraduate Nursing Student**  
**Community Research**  
**Cooperative Extension**



**Presentation 310**

Abstract Title: **Comprehensive Support Plan for Sexual Assault Survivors**

Author(s): C. Thompson, College of Nursing, U of Kentucky; G. Porter, College of Nursing, U of Kentucky;  
M. Villalvazo, College of Nursing, U of Kentucky; P. Adhikari, College of Nursing, U of Kentucky;  
T. Trowel, College of Nursing, U of Kentucky;

**Abstract:** Sexual assault is a pervasive issue on college campuses, often leaving survivors with lasting emotional and psychological trauma, including PTSD and depression. While existing support systems such as therapy and counseling are vital for recovery, significant gaps in care remain. This project aims to develop and implement a survivor-centered social support plan at the University of Kentucky, ensuring accessible and inclusive resources both on-campus and in the broader community. Through surveys and focus groups, the project will evaluate current reporting processes, identify gaps in services, and propose concrete, evidence-based improvements. Key initiatives will include expanding peer support networks, creating culturally responsive educational materials, and strengthening collaborations with local advocacy groups. Additionally, the project will enhance access to and awareness of existing services such as the VIP Center, crisis hotlines, and student wellness programs by addressing systemic barriers that may prevent survivors from seeking help. By prioritizing survivor voices, increasing awareness, and fostering an environment of healing and empowerment, this initiative seeks to create a more supportive and resilient campus community.

Supported by:

Primary Presenter / email: **Adhikari, Pranisha / pad232@uky.edu**  
**Undergraduate Nursing Student**  
**Basic Research**

**Presentation 311**

Abstract Title: **Breaking the Chain: Supporting Pregnant Women Throughout Incarceration and Substance Use**

Author(s): K. L. Brewer, College of Nursing, U of Kentucky; A. K. Clark, DNP, RNC-OB, MSN, BSN, College of Nursing, U of Kentucky, Lexington, KY

**Abstract:** Families uniquely affected by incarceration and substance use require compassionate, tailored care due to the substantial barriers they encounter within the healthcare system, including stigma and limited access to vital resources. Substance use and incarceration during pregnancy pose significant risks to both the mother and the fetus; thus, delivering empathetic care during this critical period is essential.

Despite advancements in healthcare, many pregnant women struggling with substance use disorders or incarceration still face obstacles to receiving appropriate treatment, particularly in accessing Medication-Assisted Treatment (MAT). Research indicates that MAT not only enhances pregnancy outcomes but also decreases the risk of neonatal abstinence syndrome (NAS). Furthermore, studies demonstrate that keeping infants with their mothers after birth not only fosters better neonatal health outcomes but also contributes to lower recidivism rates and decreases the need for pharmacological interventions.

There is an urgent need for systemic change within healthcare systems and communities to ensure correctional facilities promote mother-infant bonding by creating family-centered environments. Hospitals must strive to keep infants diagnosed with NAS with their mothers whenever appropriate, rather than separating them in nurseries or Neonatal Intensive Care Units.

Educating healthcare providers about unique family needs is needed as part of evidence-based practice. The Respectful Care Certification course emphasizes the need to provide equitable, respectful, and compassionate care to women in these unique family circumstances. By doing so, we can enhance our healthcare practices, reduce stigma, and ultimately improve health outcomes for all families.

Supported by:

Primary Presenter / email: **Brewer, Kelsie** / [klbr241@uky.edu](mailto:klbr241@uky.edu)  
**Undergraduate Nursing Student**  
**Health Equity Research**

Presentation 312

Abstract Title: **Prenatal Depression Symptoms Affecting Breastfeeding Outcomes in Hispanic Women**

Author(s): A. M. Linares, DNS, RN, IBCLC, FILCA, FAAN, Associate Professor College of Nursing, U of Kentucky; H. Brown, BSN Student, College of Nursing, U of Kentucky; A. Chamberlain, BSN, RN, IBCLC, CCCE, College of Medicine, U of Kentucky, Lexington, KY

**Abstract:** Introduction: Prenatal and postpartum depression are associated with adverse maternal and child outcomes. In the U.S., compared with non-Hispanic white children, Hispanic children have an increased risk of diseases attributable to suboptimal breastfeeding. This study aimed to determine whether prenatal depressive symptoms were associated with breastfeeding practice in a group of Hispanic mothers in the US.

Methods: This longitudinal exploratory study sampled 60 self-identified Hispanic pregnant women recruited from a Central Kentucky outpatient clinic. The Health-Related Social Needs Screening Tools (Center for Medicare & Medicaid Services) collected SDOH and mental health issues. The Infant Feeding Intention (IFI) and Breastfeeding Self-Efficacy (BFSE) Spanish versions were used to evaluate breastfeeding intention prenatally and self-efficacy postpartum.

Results: Hispanic pregnant women reported feeling "little interest or pleasure in doing things" (27%), "feeling down, depressed, or hopeless" (28%), and "feeling stress" (45%). Depression symptoms correlate positively with financial constraint ( $r = .28, p = .02$ ), and negatively with the Acceptability of the pregnancy ( $r = -.33; p = .01$ ), Intention to breastfeed ( $r = -.32; p = .001$ ), Acculturation ( $r = -.42; p < .001$ ), and Breastfeeding self-efficacy ( $r = -.31; p = .03$ ). The mean value of depressive symptoms in women who were exclusively breastfeeding (EBF) postpartum was significantly lower ( $M = .71, SD = .48$ ) compared with women that were not EBF ( $M = 1.43, SD = 2.02$ );  $t(39) = -1.89, p = .03$ .

Conclusion: These results highlight the importance of assessing prenatal depression symptoms in Hispanic women due to the association with infant feeding choices. Prioritizing culturally congruent care is essential to avoid adverse health trajectories.

Supported by: United in True Racial Equity (UNITE) General Pilot Grant

Primary Presenter / email: **Brown, Haley** / [hsbr231@uky.edu](mailto:hsbr231@uky.edu)  
**Undergraduate Nursing Student**  
**Health Equity Research**

**Presentation 313**

Abstract Title: **Fighting the Stigma and Improving Health Outcomes for Pregnant Women with Substance Use Disorder**

Author(s): B. N. Bush, Student Nurse, U of Kentucky; A. Clark, DNP, RNC-OB, MSN, BSN

**Abstract:** Pregnant women with substance use disorder represent a marginalized group within healthcare. These women often form "unique families," a term for family structures shaped by the intersection of pregnancy, societal biases, and complex needs. They are disproportionately affected by stereotypes that label them as "bad mothers," leading to misinformation and maltreatment in both medical and social contexts. The stigma can deter them from seeking necessary prenatal and addiction-related care, fearing punitive actions or judgement from providers. These women often have limited access to care, due to their socioeconomic status, history of trauma, and lack of specialized addiction services. Women with SUD are less likely to receive consistent prenatal care, which exacerbates health disparities and increases the risk of poor maternal and fetal outcomes. Care for unique families, specifically pregnant women with SUD, must prioritize respect, dignity, and a non-judgmental approach. The Respectful Care Certification course teaches supportive ways to interact with marginalized populations, highlights the barriers these individuals face, and rebukes common misunderstandings surrounding them. The psychological and physical dependence on given substances does not just fade away when one becomes pregnant. As caregivers and providers, we must not ask "how could they" but instead "what happened to them." If we lead with compassion, provide trauma-informed, evidence-based care, and understand the need for more comprehensive treatment, we will ensure better outcomes for mothers and newborns. Fostering an environment where pregnant women with SUD are treated with respect and without bias, can dismantle harmful stereotypes that perpetuate inequities in healthcare.

Supported by:

Primary Presenter / email: **Bush, Brianna / bnbu231@uky.edu**  
**Undergraduate Nursing Student**  
**Health Equity Research**

**Presentation 314**

Abstract Title: **Syringe Service Program: A Harm Reduction Approach for Nursing Practice**

Author(s): E.C. Cartwright, College of Nursing, U of Kentucky; M.G. Walden, MSN, RN-BC, College of Nursing, U of Kentucky; Lexington, KY

**Abstract:** In the time between 1999-2022, the United States has reported an estimated 727,000 opioid-related overdose deaths. The opioid epidemic is a public health crisis, starting with the increased availability of pharmaceutical opioids leading to their misuse, evolving into heroin use and now predominantly fentanyl, a highly potent synthetic opioid. Created to combat the opioid epidemic, Syringe Service Programs (SSPs) are community-based prevention programs shown to reduce overdose deaths caused by injection. SSPs exist to provide access to and disposal of sterile syringes and injection equipment. Beyond this, these programs offer confidential and anonymous harm reduction services like links to substance use disorder (SUD) treatment, testing for Human Immunodeficiency Virus (HIV) and Hepatitis C (HCV), referral for infectious diseases, and vaccinations. As a direct result of SSPs, the United States has seen a 50% decrease in HIV and HCV infections. Data also reports that users are five times more likely to seek treatment for SUD and three times more likely to stop using drugs altogether. Undeterred by this data, a persistent stigma remains that SSPs enable those who struggle with SUD by providing injection materials, thereby contributing to an unsafe community. Educating healthcare professionals can help reduce the stigma around SSPs and improve harm reduction education, including increasing awareness of SSPs and where to access them.

Supported by:

Primary Presenter / email: **Cartwright, Ella** / [ecca250@uky.edu](mailto:ecca250@uky.edu)  
**Undergraduate Nursing Student**  
**Community Research**

**Presentation 315**

Abstract Title: **Enhancing Pediatric Oncology Pain Management: Implementing Comfort Carts to Integrate Non-pharmacological Interventions.**

Author(s): K. N. Coleman, College of Nursing, U of Kentucky; O. R. Harder, College of Nursing, U of Kentucky; F. R. Kelly, College of Nursing, U of Kentucky; E. K. Davis, College of Nursing, U of Kentucky; J. A. Guilliams, CCLS, Kentucky Children's Hospital; A. R. Arehart, CCLS, Kentucky Children's Hospital; M. E. Chojnacki, Associate Professor College of Nursing, U of Kentucky

**Abstract:** Background: Pharmaceutical pain management remains a primary approach in pediatric oncology care. However, concerns about overmedication, adverse effects, and long-term consequences necessitate a need for complementary management. Over-reliance on medications can lead to sedation, dependence, and adverse developmental outcomes. While evidence supports nonpharmacological pain interventions, a gap on their use exists in pediatric nursing practice. Many nurses lack training and confidence in implementing these methods, limiting holistic pain management. Addressing this gap is crucial to reducing unnecessary medication use and improving patient outcomes through integrative, evidence-based approaches.

Methods: Student nurses and Child Life staff educated pediatric bedside nurses at Kentucky Children's Hospital (KCH) on using comfort carts to implement diversional pain reduction interventions in pediatric oncology patients. Students collaborated in the planning and implementation of this quality improvement project. Nursing students assisted in assembling comfort carts and performing roaming unit education.

Results: Numbers of nurses educated, limitations and strengths of the project plan and implementation will be discussed here when the project is complete in early March. The team anticipates gathering subjective data on the project during the roaming education on the unit floors. The subjective data will include efficiency, convenience, and if the education was adequate.

Discussion: This project benefits KCH nursing staff and patients through comfort cart implementation. Strengths of the study design include a large sample size, collaboration with Child Life and nursing quality improvement council, and replication potential. A key limitation is its resource-intensive nature, requiring significant time for comfort cart vendor and nursing council collaboration.

Supported by:

Primary Presenter / email: **Coleman, Katherine / knco241@uky.edu**  
**Undergraduate Nursing Student**  
**Dissemination & Implementation Research**

Presentation **316**

Abstract Title: **Improving Mental Health in Pediatric Hem/Onc Patients: Nursing Interventions and Holistic Care Strategies**

Author(s): Meaghan Haddix, Department of Nursing, U of Kentucky

**Abstract:** Mental health challenges, including anxiety and depression, are highly prevalent among pediatric hematology/oncology (hem/onc) patients, significantly impacting their emotional well-being, treatment adherence, and overall quality of life. Despite growing awareness, mental health needs in this vulnerable population are often under-recognized and under-prioritized, leading to adverse health outcomes, prolonged hospital stays, and increased healthcare costs. This paper examines the prevalence of anxiety and depression among children and adolescents with hem/onc conditions, explores their effects on morbidity and mortality, and analyzes the economic burden of untreated mental health issues. Evidence-based interventions, such as routine mental health screenings, cognitive behavioral therapy (CBT), expressive therapies, and peer support programs, are reviewed with an emphasis on the critical role of nurses in implementing these strategies. Nurses are uniquely positioned to identify early signs of psychological distress, provide family-centered education, advocate for comprehensive mental health care, and promote holistic treatment environments. Additionally, the role of DanceBlue, a student-led initiative, is highlighted as a model for supporting pediatric hem/onc mental health programs through funding and advocacy. Recommendations for nursing practice include integrating mental health assessments into routine care, facilitating access to mental health professionals, and expanding educational resources for families. By prioritizing mental health alongside physical treatment, healthcare providers can improve clinical outcomes, reduce healthcare costs, and enhance the quality of life for pediatric hem/onc patients and their families. This comprehensive approach underscores the importance of holistic care in addressing the complex needs of children facing life-threatening illnesses.

Supported by: BH Well- University of Kentucky College of Nursing

Primary Presenter / email: **Haddix, Meaghan** / haddix.meaghan@uky.edu  
**Undergraduate Nursing Student**  
**Dissemination & Implementation Research**

**Presentation 317**

Abstract Title: **How Effective are HPV Vaccination Interventions Among Young Adults (18-26 years)**

Author(s): E. G. Music, College of Nursing, U of Kentucky; W. Abubakari, College of Nursing, U of Kentucky; A. Adegboyega, College of Nursing, U of Kentucky

**Abstract:** Background. Human Papillomavirus (HPV) is the most common sexually transmitted infection. Persistent infections can develop into HPV-related cancers including cervical and Penile cancer. HPV vaccination could prevent more than 90% of cancers caused by HPV from ever developing. HPV vaccination was recently expanded to all persons through age 26 years, who had not been previously vaccinated, but uptake remains low. Aim: This literature review evaluates HPV vaccination interventions targeting young adults (18-26 years). Methods. We searched PubMed, CINAHL, and Google Scholar using a combination of Mesh terms "human papillomavirus," "HPV," "vaccine/s," "interventions," "effectiveness," "prevention," "uptake," and "young adult" for intervention studies published between 2014-2024. Two members of the team reviewed each article. Studies were included if they focused on HPV vaccination promotion and were conducted in the United States. Results. We identified 12 articles that met inclusion criteria, nine were randomized control trials, two pilot projects and one was a quasi-experimental study. Our review found that various interventions have improved HPV vaccination uptake including decision support tools, printed educational materials, psychosocial interventions, informational, web-based, social media campaigns, and information-motivation-behavioral skills. Interventions took place in different settings including community and care clinics, college campuses, and through social media. Participants showed improved awareness of primary and secondary cancer prevention approaches. However, not all interventions showed significant effects on HPV vaccination uptake. Conclusions. Interventions that combined multiple methods such as psychosocial and education strategies, tended to be more impactful. A multifaceted approach is recommended to increase HPV vaccination among young adults.

Supported by:

Primary Presenter / email: **Music, Emma / egmu225@uky.edu**  
**Undergraduate Nursing Student**  
**Clinical Research**



Presentation **318**

Abstract Title: **Early Skin-to-Skin Care: Impact on Exclusive Breastfeeding in Hispanic Women**

Author(s): Kendall Norrenbrock, Cara Cowans, Reese Carter, Ana Maria Linares, DNS, RN, IBCLC

**Abstract:** This study evaluated the influence of early skin-to-skin care (SSC) immediately after birth and how it sustained exclusive breastfeeding (EBF) at 1 month postpartum among Hispanic mothers. This is a secondary analysis of data from a longitudinal study conducted to assess breastfeeding in Hispanics. Two-thirds of the women participated in early SSC. At discharge, over half of the women were EBF. This decreased to one-third of mothers EBF at 1 month postpartum. Mothers who participated in early SSC were more likely to be EBF at discharge compared to those who did not participate ( $p < .001$ ). Early SSC did not have a direct effect on the status of EBF at 1 month. EBF at 1 month was associated with having a stronger intention to breastfeed during the postpartum period and during the hospital stay ( $p < .05$ ). Interventions to increase the intention to breastfeed and provide early SSC are warranted in the hospital setting to increase the promotion and support of EBF in this vulnerable population.

Supported by:

Primary Presenter / email: **Norrenbrock, Kendall** / [klno230@uky.edu](mailto:klno230@uky.edu)  
**Undergraduate Nursing Student**  
**Clinical Research**

**Presentation 319**

Abstract Title: **Empowering Communities: HIV Prevention Through Harm Reduction Strategies**

Author(s): T. R. Runion, College of Nursing, U of Kentucky, Lexington, KY; M. G. Walden, MSN, RN-BC, College of Nursing, U of Kentucky, Lexington, KY

**Abstract:** HIV prevention strategies play a crucial role in reducing the transmission, especially in high-risk populations. Prevention methods include Pre-Exposure Prophylaxis (PrEP), Post-Exposure Prophylaxis (PEP), using condoms, and harm reduction for people who use injectable drugs. PrEP reduces the risk of HIV from sexual contact by up to 99% and up to 74% for those who are exposed to HIV from injection drug use. PEP, when taken within 72 hours of HIV exposure, can reduce the risk of infection by more than 80%. Latex condoms are a cost effective and effective tool that reduces the likelihood of transmission by 90-95% if used consistently. Additionally, harm reduction strategies for those who are exposed from injectable drug use, such as getting sterile syringes from the Syringe Service Programs (SSPs) are linked to a 50% reduction in HIV and other blood linked infections. While not as effective as sterile needles, needle bleaching has also been proven to reduce the risk of HIV transmission. When used alone or in combination these strategies are highly effective tools for preventing HIV.

Supported by:

Primary Presenter / email: **Runion, Trenton / trru225@uky.edu**  
**Undergraduate Nursing Student**  
**Health Equity Research**

**Presentation 320**

Abstract Title: **A Nursing Student Guide on Intravenous Smart Pump Use to Reduce Medication Errors**

Author(s): B.M Smith, College of Nursing, U of Kentucky; S. Pilon, College of Nursing, U of Kentucky; C. Thompson, College of Nursing, U of Kentucky; M. Chojnacki, College of Nursing, U of Kentucky

**Abstract:** Medication administration safety in ICUs is crucial due to the complexity of therapies and high patient acuity, which increase error risks. Smart IV pumps, equipped with drug libraries and alerts, enhance safety by reducing errors by 16% (Skog et al., 2022). However, nursing students often lack hands-on training with these devices, limiting their clinical readiness. This project aims to address this gap by creating a simulated educational module to improve nursing students' competence and confidence in smart IV pump use.

The module uses a simulated IV pump modeled on clinical devices, presenting interactive scenarios for programming primary and secondary medications. Participants include 189 nursing students in NUR 227 at the University of Kentucky College of Nursing. Pre-surveys assess baseline skills and confidence, followed by hands-on practice using physical and online simulators during lab sessions. Post-surveys evaluate changes in confidence, skills, and error detection.

Quantitative data from pre- and post-surveys will measure competency improvements, while qualitative data from focus groups and observations will explore students' experiences and challenges. Statistical analysis will assess competency gains, and thematic analysis will identify key insights.

The study highlights simulated training's effectiveness in improving nursing students' competence and confidence with IV pumps. Anticipated findings include increased skill levels, reduced errors, and strategies to enhance training. These results underscore the value of simulation-based education in bridging the gap between theoretical learning and clinical practice, supporting its integration into nursing curricula.

Supported by:

Primary Presenter / email: **Smith, Bryce** / bryce.smith12@uky.edu  
**Undergraduate Nursing Student**  
**Basic Research**

**Presentation 321**

Abstract Title: **Predictors that influence ventilator days in severe non-traumatic brain injured patients: A Pilot Study**

Author(s): A. Howski, College of Nursing, U of Kentucky; S. Rogers, College of Nursing, U of Kentucky, Lexington, KY

**Abstract:** Background: Non-traumatic brain injuries (NTBI) can result from stroke, brain aneurysm, anoxic brain injury, or infectious disease like meningitis (Brain Injury Association of American, 2025). Each year, more than 795,000 people in the U.S. experience a stroke, one type of NTBI (U.S. Center for Disease Control and Prevention, 2025). Research shows that prolonged mechanical ventilation is associated with in-hospital mortality rates among other risks (Hung-Yu et al. 2022). The purpose of this pilot study is to examine predictors that influence ventilator days in severe NTBI patients.

Methods: This retrospective pilot study will be conducted at a large academic medical center in the southeastern United States. Data will be extracted from the electronic health records system EPIC. The sample inclusion criteria consist of ventilated adults ages 45-64, admitted to the neuro intensive care unit (NICU) with severe NTBI identified as a Glasgow Coma Scale (GCS) of 3-8 and ICD 10 code of 163. Mobilization, nutrition, sedation levels, and hemodynamic instability are the independent variables that will be evaluated as predictors of the study outcome, ventilator days. Regression analysis will be used for data analysis.

Conclusion: Identifying predictors that impact ventilator days in the severe NTBI patient population could impact patient outcomes and mortality rates. Reducing the number of ventilator days could shorten hospital length of stay (LOS) and accelerate the patient's transition to rehabilitative services, potentially enhancing recovery and quality of life.

Supported by:

Primary Presenter / email: **Howski, Ava / aeho261@uky.edu**  
**Undergraduate Nursing Student**  
**Basic Research**

**Presentation 322**

Abstract Title: **Promoting Belonging and Well-Being to Mitigate Burnout in Healthcare Students: A Blue Zone Approach**

Author(s): S. Voorhees, BSN Student, College of Nursing, U of Kentucky; H. C. Feld, College of Nursing, U of Kentucky, Lexington, KY

**Abstract:** Burnout affects 39% of the healthcare workforce globally and contributes to adverse outcomes for patients, staff, and communities they serve. Burnout is a syndrome attributed to workplace stress, fatigue, and emotional exhaustion. Social factors such as belonging and improving individual self-care practices to reduce stress can be protective against burnout. Novel approaches to prevent burnout are being integrated into healthcare education, promoting resilience, well-being, and creating an environment of belonging. We attempted to mitigate the potential for burnout by teaching health professional students to integrate practices that promote resilience and well-being linked to longevity in the areas of the world identified as 'Blue Zones'. Students take a course followed by travel to a Blue Zone with experiences intended to lead to transformative travel, which is a high-impact practice found to cultivate self-reflection, challenge perspectives, and expand worldviews. Our pre/post study explored the impact of this experience on behavior changes or perceptions, and we found significant improvements in positivity, purpose, feeling good, meaning in life, and social involvement ( $p < 0.001$ ,  $n=26$ ). Finding meaning in work/education, happiness, and connection to social media did not yield significant improvements. The findings suggest that the course and travel are transformative. Five months after travel 58% of former students applied Blue Zone principles to day-to-day life weekly and 31% applied them monthly. Implementing principles learned from the Blue Zones and translating this into meaningful student outcomes has the potential to foster a sense of belonging and well-being to mitigate burnout in future healthcare workers.

Supported by: NIH award for RedCap usage: The National Center for Advancing Translational Sciences through grant number UL1TR001998. The content is solely the responsibility of the authors and does not necessarily represent the official views of the NIH.

Primary Presenter / email: **Voorhees, Savannah** / savannah.voorhees@uky.edu  
**Undergraduate Nursing Student  
Scholarship of Teaching & Learning**

**Presentation 323**

Abstract Title: **Evaluating The Effectiveness of Social Determinants of Health Screening in an Interdisciplinary Clinic**

Author(s): T. M. Adams, College of Nursing, University of Kentucky

**Abstract:** Social Determinants of Health, including food, housing, interpersonal violence, and transportation are non-medical problems that can influence health outcomes. Low-income minorities and public-payer groups are at considerable higher risk for social needs. A literature review revealed limited evidence of screening in settings such as dental clinics. This type of setting can provide an opportunity to evaluate patient's unmet needs with SDOH screening. The patients seen in the Dental Wellness and Prevention Clinic present with a dental problem, however many have uncontrolled health conditions, and unaddressed social needs. Failure to identify and address SDOH needs in this population can lead to poorer health outcomes. The purpose of this project was to implement and evaluate the effectiveness of Social Determinants of Health screening and the quality of resources provided in an interdisciplinary clinic. Objectives: 1. Increase the number of patients screened for SDOH needs and evaluate SDOH factors and health needs, 2. Connect patients to resources and evaluate barriers, 3. Evaluate patient perception of screening for SDOH. In this quality improvement project, all patients were provided with the SDOH screening tool. Patients were excluded if under 18 years old, unable to speak, read and write English. After the screening was complete, screening was reviewed, and appropriate resources were provided by the NP student. Patients were then given a survey to evaluate their perceptions about the screening. A second survey was sent one month later to those who screened positive to evaluate resources and referrals provided. Data collection is ongoing, and results will be available at the time of presentation.

Supported by: DIRECT Award Pilot Grant- Sponsored by College of Dentistry IMPACT award.

Primary Presenter / email: **Adams, Taylor** / tnmo228@uky.edu  
**DNP Nursing Student**  
**Dissemination & Implementation Research**

**Presentation 324**

**Abstract Title: The Effect of a Hospital Community Garden on Healthcare Professional Quality of Life**

**Author(s):** M. S. Cline, University of Kentucky College of Nursing; A. Makowski, University of Kentucky College of Nursing; C.T.C. Okoli, University of Kentucky College of Nursing, A. Grubbs, University of Kentucky College of Nursing.

**Abstract:** Background: Healthcare professionals experience stressors that negatively impact professional quality of life and this leads to increased turnover. There are growing studies addressing ways to improve healthcare professional quality of life, yet few have examined the impact of alterations to the workplace on these outcomes. Purpose: To evaluate the effect of a dedicated outdoor green space for nurses during shift breaks on neurosciences nursing professional's professional quality of life (ProQOL). Methods: This study used a one-group pretest-posttest design with midpoint evaluation. The ProQOL was sent to participants at three intervals (Week 1, 3, and 6). During weeks 1-6, a three-item self-report survey was sent to participants that measured the amount of time and days spent in the garden space. Participants were asked to spend time in a designated hospital garden, which was planted by the PI of the study. Data analysis was completed using SPSS software.

Results: The mean Compassion Satisfaction score pre-intervention was 35.9 (SD=7.6) and 38.1 (SD= 6.5) post-intervention (possible range <22-42). The Burnout score pre-intervention was 27.8 (SD= 5.6) and 25.8 (SD= 5.1) respectively. This shows a decrease in burnout score post-intervention. The mean overall Secondary Traumatic Stress score pre-intervention was 28.6 (SD= 6.5) and 26.6 (SD= 6.3) respectively, which shows improvement although it is not statistically significant. However, STS scores were considered to be moderate prior to the implementation of this project. The time and days were added together using the following metric. (0-10 minutes=1, 1-2 days=1, 3-4 days=2, 5 days or more=3). The mean time spent in the garden was a score of 3.4. Thus, overall, participants did not spend significant time in the garden space which could lead to less of an impact on ProQOL.

Conclusion: In conclusion, having a garden space for nurses does show small improvements in ProQOL although not significant.

Supported by: Floret Flower Farm, Washington State (Floral Donation).

Primary Presenter / email: **Cline, Madelyn** / mrst248@uky.edu  
**DNP Nursing Student**  
**Clinical Research**

**Presentation 325**

Abstract Title: **Improving Nutrition Screening Practice in the Hospitalized Heart Failure Patient Population**

Author(s): A. J. Bourgeois, Cardiovascular Services, University of Kentucky

**Abstract:** Background: Heart Failure is a disease known to affect nearly 6.5 million adults in the United States. Characterized by recurrent hospitalizations, heart failure significantly contributes to morbidity, mortality, and healthcare costs in the United States and worldwide. Because malnutrition is prevalent in the heart failure population, healthcare providers must perform nutritional assessments on admission to intervene in the case of malnutrition, prevent deterioration, and improve patient prognosis. Without intervention and early identification of malnutrition, heart failure hospitalizations will remain a significant problem.

Purpose: The purpose of this study is to evaluate the effect of an evidence-based educational program for cardiac nurses designed to improve nutritional screening practice for hospitalized heart failure patients.

Methods: This project followed a quasi-experimental one-group time series pre-posttest design. A retrospective EPIC electronic medical records review was also completed, including data from thirty days pre-educational intervention and thirty days post-educational intervention for comparison of completeness of the nutrition screening tool, malnutrition screening tool, and number of nutrition consults ordered.

Results: Cardiac nurse knowledge increased significantly ( $p < .001$ ) after the educational intervention, with a 57% mean baseline knowledge increase. However, no significant changes were found in nutrition screening tool completion, malnutrition screening tool completion, or nutrition consults ordered.

Conclusion and Implications for Practice: Educational interventions may not be enough to overcome barriers that impact nutrition screening practice in the hospital setting. Future research efforts are needed to translate increased clinician knowledge into standard practice to decrease the burden of heart failure hospitalizations and improve patient outcomes.

Supported by: UK Center for Clinical and Translational Science

Primary Presenter / email: **Bourgeois, Amanda** / amanda.bourgeois1@uky.edu  
**DNP Nursing Student**  
**Clinical Research**



**Presentation 326**

Abstract Title: **Evaluating the Efficacy of a Progressive Mobility Protocol Among Adult ICU Patients**

Author(s): C. Chroust, University of Kentucky DNP Student, U of Kentucky

**Abstract:** Background: Intensive care unit (ICU) patients are critically ill requiring ventilatory support and often do not receive mobility interventions until after they are extubated or leave the ICU. Current literature suggests that patients in the ICU face increased ventilator days, development of hospital acquired infections, and increased days in the ICU due to a lack of mobility. This project will discuss the impact of a progressive mobility protocol among ICU patients at Ballad Health's Johnson City Medical Center.

Purpose: To evaluate the efficacy of a progressive mobility protocol among adult ICU patients and their outcomes.

Methods: A quasi-experimental retrospective chart review was done during a one-month period examining pre and post implementation of the progressive mobility protocol (n = 117). Key variables examined were patient ventilator free days, length of mechanical ventilation, ICU length of stay, hospital acquired infections, rapid responses, and Charleson comorbidity index (CCI) scores.

Results: Ventilator free days worsened by 1.3 days in total, infection rates increased by 3 percent and mechanical ventilator days increased by 2 days. Patient ICU length of stay was 11 days compared to 3 days in the control group. Twenty-four percent of patients had a rapid response called compared to 19.56 percent in the control group. CCI scores were lower in the intervention group.

Conclusion: This project showed no statistically significant difference with utilization of a progressive mobility protocol when compared to current practice standards. The key limiting factors of this study were provider implementation variability and sample power size.

Supported by:

Primary Presenter / email: **Chroust, Clayton** / clayton.chroust@uky.edu  
**DNP Nursing Student**  
**Dissemination & Implementation Research**

**Presentation 327**

Abstract Title: **Evaluating the Utilization & Efficacy of Diet & Physical Activity Screening Tools for Adults with T2DM in Primary Care**

Author(s): A. O. Dalton, College of Nursing, U of Kentucky

**Abstract:** Only half of individuals with type 2 diabetes mellitus (T2DM) have a hemoglobin A1C of less than 7%, indicating poor glycemic control. Although diabetes is considered a diet-sensitive disease, an individual's diabetes-related nutrition knowledge is one of the most challenging aspects of the treatment plan. Empirical evidence supports that a combination of dietary and physical activity interventions is more effective than nutrition education alone. Performing a dietary evaluation is fundamental to establishing nutrition goals. The use of the Starting the Conversation (STC) tool, which assesses an individual's dietary practices, and Physical Activity Vital Sign (PAVS) tool, which assesses an individual's level and amount of physical activity, have shown to improve A1c and other outcomes for patients with T2DM.

The purpose of this project is to implement and evaluate the use of the STC and PAVS screening tools for adults with T2DM in primary care. A quasi-experimental design, guided by The Iowa Model of Evidence-Based Practice to Promote Quality Care, was used. The project took place at a clinic serving a low-income, underserved population in central Kentucky. Current screening practices for exercise and nutrition in individuals with T2DM were evaluated. Clinic providers were educated on the screening tools, which were implemented over 11 days. Screening documentation rates and specific patient quality metrics were measured through chart audits, while provider and patient satisfaction was evaluated through surveys. The project will be completed April 2025. Findings are expected to show increased screening documentation rates and improved glycemic control in adults with T2DM.

Supported by:

Primary Presenter / email: **Dalton, Ashley** / [ashley.dalton1@uky.edu](mailto:ashley.dalton1@uky.edu)  
**DNP Nursing Student**  
**Quality Improvement**

**Presentation 328**

Abstract Title: **A Triage Process to Decrease Door to EKG Times for Adult Patients With Suspected Cardiac Abnormalities in the Emergency**

Author(s): K. Douangdara, College of Nursing, U of Kentucky, Lexington, KY

**Abstract:** Objective: The emergency department (ED) triage process for adult patients presenting with suspected cardiac abnormalities should be reliable; however, delays in identifying significant cardiac rhythms can negatively impact patient outcomes. The American Heart Association (AHA) and the American College of Cardiology (ACC) recommend that patients presenting to the ED with cardiac-related concerns undergo an electrocardiogram (EKG) within 10 minutes of arrival. This project aimed to educate ED nurses and implement changes in the triage process to reduce door-to-EKG times.

Methods: This quasi-experimental study utilized a pre- and post-intervention design to evaluate the effectiveness of an educational program on improving ED nurses' knowledge and confidence in cardiac triage protocols. The sample consisted of ED clinical staff nurses (N = 53), primarily aged 26-45 years, with 85% identifying as female and 94% as White, non-Hispanic. Most participants had 1-10 years of clinical nursing experience, and 34% had 1-5 years of ED-specific experience. Data analysis was conducted with descriptive statistics used to summarize demographics, knowledge, confidence, and patient care practices.

Results: Statistical analysis revealed a significant improvement in nursing knowledge scores post-intervention (mean increase from 5.7 to 6.2,  $p = 0.005$ ). Despite a 10.5% increase in ED patient volume, door-to-EKG times showed a slight reduction from 16 to 15 minutes.

Conclusion: This study demonstrates the effectiveness of an educational intervention in enhancing ED nurses' knowledge of AHA/ACC guidelines and cardiac triage protocols. While knowledge improved significantly, further strategies may be required to optimize clinical application and reduce door-to-EKG times more substantially.

Supported by:

Primary Presenter / email: **Douangdara, Khay** / kdoua2@uky.edu  
**DNP Nursing Student**  
**Basic Research**

**Presentation 329**

Abstract Title: **The Impact of a Geriatric Trauma Unit**

Author(s): Shannon E. Johnson, University of Kentucky College of Nursing

**Abstract:** Introduction: Traumatic injuries in the geriatric (> 65) patient population can have devastating effects. Only a small percentage of these patients return to independent ambulation and living following an injury. Geriatric friendly hospital wards in several disciplines have been recognized in the literature to reduce length of stay and improve patient outcomes. However, there has been no research surrounding geriatric trauma wards specifically. The purpose of this quality improvement project is to evaluate the impact of admitting geriatric trauma patients to a dedicated unit. This unit will incorporate the tenets of a geriatric friendly hospital environment as identified by the American College of Surgeons (ACS) in the 2023 Geriatric Trauma Best Practice Guidelines. The ACS recommendation for dedicated geriatric trauma units drives the need to explore a unit-based approach to geriatric trauma care.

Methods: The goal was to cohort as many of the geriatric trauma patients as capacity would allow to beds on the 9.200 universal unit at the University of Kentucky (UK) Hospital during the designated study time period (09/01/24-11/30/24). Data will be collected from the UK trauma registry database regarding length of stay, mortality, complications, and discharge disposition. This data will be compared to a control group of geriatric trauma patients from one year prior to the unit opening, as well as patients that are not cohorted to the geriatric trauma unit (due to capacity constraints) during the same 3-month time period.

Results: Analysis is still pending. Final data validation and collection is in process by the trauma registrars for the study time period.

Discussion/Conclusion: This information will be based final results and data analysis.

Supported by:

Primary Presenter / email: **Johnson, Shannon** / seturb2@uky.edu  
**DNP Nursing Student**  
**Quality Improvement**

**Presentation 330**

Abstract Title: **Clarifying end-of-life care: A nursing education initiative**

Author(s): S. C. Kingsley, Doctorate of Nursing Practice, University of Kentucky

**Abstract:** The complexity of patient care in Medical Intensive Care Units (MICUs) often leads to difficult end-of-life decisions. This Doctor of Nursing Practice (DNP) project aimed to integrate hospice principles into the MICU environment to improve patient comfort and family satisfaction during critical illnesses. Utilizing a quasi-experimental pre- and post survey design, the project assessed current understanding and practices related to hospice care, identifying barriers and developing educational resources. An emailed video and laminated pocket card containing essential hospice information were provided to staff to enhance their understanding. Data was collected through pre- and post-intervention surveys measuring staff knowledge and confidence in hospice care. This initiative equipped nurses to make appropriate referrals and deliver compassionate, high-quality care in end-of-life situations. Additionally, patient charts were reviewed to compare outcomes before and after the intervention.

Although results are still pending, the project underscores the need for interdisciplinary collaboration and customized education to facilitate smoother transitions to hospice care in the MICU. By implementing hospice principles, MICUs can enhance care quality and respect patient and family preferences during challenging times. Following established protocols for hospice care may also improve patient outcomes through more effective symptom management and care techniques. This DNP project contributes to the conversation about patient-centered care in acute settings, emphasizing the crucial role of nursing in fostering holistic end-of-life care approaches.

Supported by:

Primary Presenter / email: **Kingsley, Spring** / [ski271@uky.edu](mailto:ski271@uky.edu)  
**DNP Nursing Student**  
**Clinical Research**

**Presentation 331**

Abstract Title: **Utilization of Organ Inventories in the Primary Care Setting: Identifying Barriers and Increasing Usage**

Author(s): S. A. Lister, College of Nursing, U of Kentucky

**Abstract:** Background: The Transgender and Gender Diverse (TGD) population experiences significant health disparities in accessing preventative care when compared to their cisgender counterparts. These disparities often occur with organ-specific screenings and lead to poorer health outcomes, due to patients having organs that do not match their sex assigned at birth. The evidence recommends a two-question method of gender identification to identify those patients whose gender does not match their sex assigned at birth. Using the 2-question method can help identify patients who need an organ inventory completed, which will lead to appropriate preventative health screenings being done.

Purpose: The purpose was to standardize the use of a two-question method of gender identity screening to identify patients in need of organ inventory completion.

Methods: Data was collected from three providers who provide primary care to both TGD and cisgender patients at a Family and Community Medicine clinic affiliated with a large academic medical center. A practice improvement method was used to introduce using the 2-question gender identification and notification to providers if there was a discrepancy with sex assigned at birth. The PI met with staff twice to determine if there were any barriers to implementation. Data collection was done by chart review before and after implementation of the intervention.

Expected Results: A standardized 2-question method of gender identification increased rates of organ inventory completion by primary care providers.

Supported by:

Primary Presenter / email: **Lister, Siobhan** / siobhan.lister@uky.edu  
**DNP Nursing Student**  
**Quality Improvement**

Presentation **332**

Abstract Title: **Evaluating the Impact of Stress First Aid Programs in a Primary Care Setting**

Author(s): R. Marler, Department of Ambulatory Internal Medicine, U of Kentucky

**Abstract:** Introduction: Stress has long been a part of human experience. The impact of stress in healthcare settings has become increasingly prominent. Levels of stress among healthcare workers (HCWs) can lead to absenteeism, burnout, and a decrease in job satisfaction. Burnout, characterized by emotional, physical, and mental exhaustion, can disrupt workflow and quality of care. Addressing stress in the workplace requires a multifaceted approach, including creating supportive environments, offering mental health resources, and encouraging work-life balance.

Purpose: This project implemented and assessed the effectiveness of the Stress First Aid (SFA) program to reduce burnout and absenteeism among HCWs in UK healthcare settings. This initiative aims to enhance HCWs' understanding of stress management strategies and available resources, that foster a healthier work environment.

Methods: This quality improvement project utilized a pre- and post-intervention design. Participants completed surveys before and after the intervention. Thirty-two participants completed the pre-intervention survey. Fifteen participants attended the education class and completed the post survey. Burnout was measured using an adapted Maslach Burnout Inventory, knowledge of stress-related resources was assessed through a survey designed by the investigators. Absenteeism was evaluated using staffing reports.

Results: Preliminary outcome data demonstrates a reduction in absenteeism, lower burnout scores, and increased knowledge of stress-related resources.

Discussion/Conclusion: Implementing the SFA program promotes the mental and emotional well-being of HCWs. Providing stress management tools and enhancing resource awareness can lead to decreased burnout, absenteeism, and improved job satisfaction, contributing to a more resilient workforce and better patient care.

Supported by:

Primary Presenter / email: **Marler, Ryan** / ryan.marler@uky.edu  
**DNP Nursing Student**  
**Translational Research/Science**

**Presentation 333**

Abstract Title: **Evaluating the Outcomes of an Educational Intervention for Providers and Two Week Home Blood Pressure Monitoring**

Author(s): Schuler, M. S., College of Nursing, U of Kentucky

**Abstract:** Background: Approximately 1.28 billion adults worldwide have hypertension (HTN), which greatly increases the risk of disease morbidity and premature death. Home blood pressure monitoring (HBPM) has been shown to increase efficacy of treatment decisions and treatment but is underused in primary care. About 46% of adults are unaware that they have hypertension and only about 21% of those who have been diagnosed have it controlled.

Purpose: The purpose of this project is to evaluate a previous practice improvement project and improve the HBPM process for sustainability.

Methods This HBPM study utilized a retrospective study design combined with a practice improvement project to strengthen evidence for future usage of the HBPM handout. The setting was UK Phyllis D. Corbitt Clinic primary care in Wilmore, KY. The PI attended a staff meeting with the APRNs to discuss strengthening BP control through HBPM, smart phrase use, and CPT codes. Adults with a blood pressure >130/80 who had a home blood pressure cuff were identified and provided with with a HBPM handout to record BPs and return in two weeks. Written consent was obtained. The Center for Clinical and Translational Science (CCTS) to provided medical record numbers (MRNS) of 100 patients with a BP >130/80 before and after educating the APRNs of Wilmore at a staff meeting to evaluate the usage of smart phrase "homebp", CPT codes, and demographic data.

Results: Expecting BPs post-education chart review will be improved and smart phrase "homebp" and CPT codes will be utilized more post-implementation.

Conclusion: TBD.

Supported by: UK CCTS Investigators

Primary Presenter / email: **Schuler, Michelle** / mast230@uky.edu  
**DNP Nursing Student**  
**Dissemination & Implementation Research**



**Presentation 334**

Abstract Title: **Enhancing Patient and Family Centered Care: Transforming the NICU Experience Through Compassionate Support and Teamwork.**

Author(s): K. D.Thompson, Department of Maternity Services: NICU Baptist Health Lexington, University of Kentucky College of Nursing.

**Abstract:** Background: An unforeseen NICU stay can be very stressful for families and can place high emotional stress and worry on parents. Nurses leveraged the Magnet culture to facilitate some of the same activities and experiences that parents would have normally done had their baby been at home to ensure inclusion and a sense of belonging.

Purpose: This project focused on increasing family centered care/parental involvement following COVID, minimizing stress for families, and creating positive memorable experiences, to improve patient experience scores for "staff working well together to care for you" and the overall nursing rating.

Methods: As a part of the unit professional governance structure, the patient experience team implemented specific interventions to help ease the transition for parents of NICU patients. Some of these interventions included milestone cards for the patient (first bath, first bottle etc). At the holidays the nurse-driven team also selected a theme for each celebration to create keepsakes and photos for families to celebrate their first holiday. At discharge every patient is provided a graduation cap and can take a photo with a nurse designed banner on the day of discharge. Nurses also created personally illustrated coloring books with poems and goody bags for each sibling.

Results: This project has increased the overall patient and family experience in the NICU. Pre project implementation top box scores were: "Staff worked together to care for you" at 33.33% and "Nurse Overall" at 50%. Post implementation top box scores indicated an increase to 100% for both "Staff worked well together to care for you" and "Nursing Overall".

Discussion/Conclusions: A dedicated patient experience team enhances communication between medical providers and families, and provides emotional support, which improves the overall experience of care received. Patient experience team projects also have an impact on overall unit culture by increasing nurse engagement.

Supported by:

Primary Presenter / email: **Thompson, Kimberly** / kimberly.thompson5@bhsi.com  
**DNP Nursing Student**  
**Basic Research**

**Presentation 335**

Abstract Title: **Improving the Diabetic Foot Screening Process and Foot Care Patient Education in a Primary Care Setting**

Author(s): K. B. Tillett, College of Nursing, U of Kentucky

**Abstract:** Background: Foot ulcerations are a common diabetes-associated complication that can lead to significant morbidity, mortality, and financial burden for patients and health care systems. Health care providers (HCPs) play an important role in providing diabetic foot care. Despite national guidelines recommending HCPs perform an annual foot exam in all individuals with diabetes to recognize at-risk feet, research shows that many type 2 diabetes (T2DM) patients do not receive routine diabetic foot exams (DFE) in the primary care setting. Purpose: To evaluate the effect of provider education, a standardized DFE template, and an electronic health record (EHR) alert on provider adherence to diabetic foot screening and delivery of patient education for T2DM patients.

Methods: This project was a quasi-experimental pretest-posttest design combined with a quality improvement process at a primary care clinic. Anonymous online surveys evaluated PCP knowledge and confidence in diabetic foot screening before and after an educational training. A 3-month intervention period implemented a standardized DFE template, an EHR alert, and foot-care patient education. Retrospective and prospective chart reviews identified the percentage of T2DM patients with an annual foot exam, degree of exam completeness, and foot-care patient education pre- and post- implementation.

Results: Expected findings are that educational training will increase providers' knowledge and confidence in diabetic foot screening. Additionally, a DFE template, EHR alert, and patient education will increase provider compliance with diabetic foot screening and patient education.

Conclusion: Diabetic foot screening is a fundamental element of comprehensive diabetes management and allows HCPs to identify at-risk feet and prevent complications.

Supported by: The project described was supported by the NIH National Center for Advancing Translational Sciences through grant number UL1TR001998.

Primary Presenter / email: **Tillett, Keelie** / keelie.dyson@uky.edu  
**DNP Nursing Student**  
**Quality Improvement**

**Presentation 336**

Abstract Title: **Implementation of a Post-Code Debrief Tool led by the Chaplain and the Unit Lead Nurse in the Medical ICU**

Author(s): S. E. Stigall, College of Nursing, University of Kentucky

**Abstract:** Background: Post-code debriefs improve teamwork and communication and reduce burnout. However, at the University of Kentucky (UK), while debriefs are documented 60-76% of the time, they are often underperformed compared to documentation. The current policy lacks specific guidance on debriefing content.

Purpose: This study explores barriers to post-code debriefing and tests a pilot debrief tool introduced by chaplains and the unit lead nurse in the University of Kentucky MICU.

Methods: A quasi-experimental cohort study will involve bedside nurses at UK MICU. It includes pre-education and intervention surveys, an educational session on the debrief tool, and post-implementation surveys to assess tool effectiveness.

Results: TBD

Conclusion: TBD

Supported by:

Primary Presenter / email: **Stigall, Sarah** / sest242@uky.edu  
**DNP Nursing Student**  
**Dissemination & Implementation Research**

**Presentation 337**

Abstract Title: **What We Say Matters: Reducing Drug Use Stigmatization by Healthcare Professionals Through Narrative Based Education**

Author(s): A. Traugott, College of Nursing, U of Kentucky; H. Chitwood, College of Nursing, U of Kentucky

**Abstract:** Background: Stigma towards substance use has been identified as a contributor to poorer care and health outcomes amongst people who use drugs (PWUD), a vulnerable population. Healthcare worker stigma negatively affects the outcomes of individual patients and may have greater public health implications. Methods of addressing drug-use stigma have previously been implemented in a variety of clinical settings. Presenting the lived experience of PWUD to healthcare workers via emotionally compelling narratives has been found to be an effective means of stigma reduction.

Purpose: This two-part study utilized psychometrically validated tools to measure (1) baseline incidence of drug use stigma as reported by adult inpatients with a history of substance use, and (2) the efficacy of an intervention designed to reduce drug use stigma amongst healthcare staff.

Methods: Narrative vignettes of PWUD were incorporated within an educational campaign targeting healthcare workers with direct patient contact on a single adult medical-surgical unit at the University of Kentucky (UKHC).

Results: For part one, a sample of twenty inpatients reported high levels of drug use stigma on anonymous pre-interventional surveys. For part two, a sample of twenty healthcare workers was assessed for their knowledge, attitudes, and behaviors pertaining to drug use stigma via pre- and post-interventional surveys.

Conclusions: Drug use stigma currently affects some inpatients at UKHC. Healthcare worker survey responses suggest that targeted education incorporating narrative vignettes might be capable of reducing the likelihood that patients with a history of substance use will encounter drug use stigma while hospitalized.

Supported by:

Primary Presenter / email: **Traugott, Adam** / adam.traugott@uky.edu  
**DNP Nursing Student**  
**Health Equity Research**

Presentation **338**

Abstract Title: **Managing Cancer Related Fatigue: Can Yoga Help?**

Author(s): L. R. Yeager, College of Nursing, U of Kentucky

**Abstract:** Introduction: Cancer related fatigue (CRF) is one of the most prevalent and distressing side effects experienced by individuals undergoing cancer treatment. Many patients report CRF as more debilitating than pain itself. CRF is characterized by persistent, severe exhaustion not alleviated by sleep and not linked to prior exertion. Despite its widespread impact, the options available to manage CRF are limited, including practices like good sleep hygiene, balanced nutrition, mindfulness, and supplements. Integrative medicine, particularly yoga, has emerged as a promising intervention for reducing CRF. However, yoga is underutilized as a therapeutic approach to combat this debilitating symptom.

Purpose: This project aims to assess the effectiveness of yoga in reducing CRF among patients undergoing active cancer treatment by referring them to an integrative medicine clinic for yoga and measuring outcomes using the European Organization for Research and Treatment of Cancer Quality of Life Module Measuring Cancer Related Fatigue (EORTC QLQ-FA12) scale before and after this intervention.

Methods: This study will employ a prospective, quasi-experimental design involving a non-randomized pre- and post-intervention approach. Participants will be chosen based on the following criteria: a cancer diagnosis, receiving active cancer treatment, and willingness to participate in the study. A pre-chart review will identify eligible patients. The goal is to enroll at least 25 participants within the designated timeframe. Pre- and post-intervention assessments will be conducted using the EORTC QLQ-FA12 tool to measure changes in fatigue level.

Results: Will be available at time of conference

Discussion/Conclusion: Will be available at time of conference

Supported by:

Primary Presenter / email: **Yeager, Leah** / lryeag2@uky.edu  
**DNP Nursing Student**  
**Clinical Research**

**Presentation 339**

Abstract Title: **Barriers to Participation in Formal Support Groups for Sexual and Gender Minority Cancer Survivors: A Systematic Review**

Author(s): L. Baser, College of Nursing, University of Kentucky

**Abstract:** Purpose: The purpose of this systematic review is to ascertain what barriers prevent the participation in formal support groups for sexual and gender minority (SGM) cancer survivors.

Methods: A systematic review of the literature was conducted, adhering to the guidelines set forth by PRISMA. Two online databases were searched: PubMed and CINAHL. Application of inclusion/exclusion criteria yielded thirteen articles for inclusion. Articles were critically appraised utilizing the CASP checklist.

Results: Although the included studies varied in design, only qualitative data was relevant for the scope of this review. A variety of countries were included, with the majority conducted within the United States (n=7). Sample sizes ranged from n=11 to n=430. Four themes emerged as barriers preventing SGM cancer survivors from participating in formal support groups: groups being heteronormative in nature, lack of/difficulty finding SGM specific support groups, fear of being discriminated against, and lack of feelings of community/connection within support groups.

Conclusion: This study highlights barriers related to SGM cancer survivor's participation in formal cancer support groups; therefore, future studies should implement interventions to reduce these barriers.

Implications for cancer survivors: SGM cancer survivors face unique barriers that prevent participation in formal cancer support groups due to political, historical, and geographical contexts. Increasing engagement with this community has the potential to positively influence quality of life and provide a holistic approach to cancer care and support. Creating cancer support groups specific for SGM cancer survivors may reduce the aforementioned barriers and improve survivorship.

Supported by:

Primary Presenter / email: **Baser, Louis** / louisbaser3@gmail.com  
**PhD Nursing Student**  
**Health Equity Research**

Presentation 340

Abstract Title: **Are Females with Metabolic Syndrome at Greater Risk of Oxidative Stress and Its Contributing Factors Than Males?**

Author(s): Islam M Alhusban, PhD student, MSN, RN; Martha Biddle, PhD, APRN, FAHA

**Abstract:** Background: Oxidative stress, an imbalance between oxidants and antioxidants, exacerbates metabolic syndrome and worsens health outcomes. Females are at higher risk than males for inflammation, psychological stress, depressive symptoms, and obesity, which contribute to metabolic syndrome and oxidative stress. However, sex-based differences in oxidative stress remain underexplored.

Aim: To examine sex-based differences of oxidative stress and its contributing factors in patients with metabolic syndrome.

Method: A secondary analysis of a randomized controlled trial was conducted to compare oxidative stress biomarkers (malondialdehyde, total antioxidant capacity), inflammatory biomarkers (C-reactive protein, interleukin-6, tumor necrosis factor-alpha), psychological stress (perceived stress scale), depressive symptoms (patient health questionnaire-9), and obesity (waist circumference) using an independent t-test. Linear regression and odds ratio were used to investigate the relationship between sex and oxidative stress.

Results: Ninety-three participants with metabolic syndrome (61±12 years old, 71% female) were included. Females had higher malondialdehyde levels (0.58±0.17 vs 0.49±0.16, P<0.01), total antioxidant capacity (2.45±0.75 vs 2.20±0.76, P=0.03), C-reactive protein levels (7.16±11.82 vs 4.40±4.73, P <0.01), psychological stress scores (14.0±8.3 vs 10.9±5.6, P <.01), and depressive symptoms (5.8±5.0 vs 4.3±3.2, P=0.01) compared to males. Sex explained 6.1% of the variation of malondialdehyde values (P=0.02). The odds risk of having higher MDA levels is 2.5 higher in females compared to males (95% confidence interval: 1.31–4.68).

Conclusion: Our findings demonstrated that females have higher oxidative stress, identifying the disproportionate higher oxidative stress burden in females compared to males. Future research is warranted to investigate sex-based differences and underlying mechanisms in oxidative stress among diverse populations in longitudinal studies.

Supported by: University of University Pilot Study Support

Primary Presenter / email: **Alhusban, Islam** / imal230@uky.edu  
**PhD Nursing Student**  
**Clinical Research**

**Presentation 341**

Abstract Title: **Differences in Patient-Centered Outcomes Between Patients with Heart Failure and With and Without Renal Dysfunction**

Author(s): I. Awal, College of Nursing, University of Kentucky; A. Thapa, College of Nursing, University of Kentucky; M. J. Biddle; College of Nursing, University of Kentucky; D. K. Moser; College of Nursing, University of Tennessee, Knoxville, TN

**Abstract:** Background: Heart failure (HF) is a complex condition, with many comorbidities, such as renal dysfunction. Differences in patient-centered outcomes (PCO), such as depressive symptoms, health-related quality of life (HRQOL), functional status, and adherence which have not been fully explored in patients with HF with or without renal dysfunction. Therefore, we aimed to examine the differences in PCOs between patients diagnosed with HF with renal dysfunction and those without renal dysfunction.

Methods: A secondary data analysis was conducted including 517 patients. Measurements included depressive symptoms (Patient Health Questionnaire-9), HRQOL (Minnesota Living with Heart Failure Questionnaire), functional status (Duke Activity Status Index), and adherence to medical treatment (Medical Outcomes Study Specific Adherence Scale). Independent t-tests were conducted to compare PCO between the two groups.

Results: Participants were  $61 \pm 13$  years old, 66% male, 66% with HF with (22%) and without (78%) renal dysfunction. Compared to patients without renal dysfunction, those with renal dysfunction had worse depressive symptoms ( $8.1 \pm 5.9$  vs  $10.0 \pm 6.0$ , respectively,  $p = 0.001$ ), poorer HRQOL ( $50.5 \pm 24.9$  vs  $58.0 \pm 25.6$ ,  $p = 0.005$ , respectively), and lower functional status ( $11.7 \pm 11.7$  vs  $77.0 \pm 7.1$ ,  $p < 0.001$ , respectively).

Conclusions: Patients with HF and renal dysfunction reported better adherence despite having higher levels of depressive symptoms, worse HRQOL, and lower functional status. Future longitudinal studies should examine the reasons for these differences in patients with HF with or without renal dysfunction.

Supported by:

Primary Presenter / email: **AWAL, ISSAHAKU** / iaw224@uky.edu  
**PhD Nursing Student**  
**Dissemination & Implementation Research**



**Presentation 342**

Abstract Title: **The Association of Psychological Stress on Nurse Practitioner Retention in Early Practice**

Author(s): L.M. Fulgham, College of Nursing, University of Kentucky; M.J. Biddle, College of Nursing, University of Kentucky

**Abstract:** Background: Transitioning into the nurse practitioner (NP) role can cause psychological stress for newly graduated NPs. The evolution of NP scope of practice and lack of standards for transition into practice may be contributing to psychological stress and job retention. There is limited evidence in the literature discussing the types of psychological stress NPs experience and retention rates within the first 24 months of practice. The purpose of this review was to identify the association of psychological stress on retention in the first 24 months of practice for NPs in a hospital setting.

Methods: We conducted systematic review following PRISMA guidelines using electronic databases CINAHL, PubMed and Embase. Articles were appraised for quality using the Critical Appraisal Skills Programme (CASP) guidelines. Articles were included if they were written in English, had a full text available and included NPs in the hospital setting.

Results: Four articles (N=224) identified there were many nuances that affected psychological stress and retention in nurse practitioners. We found that stress is associated with lack of NP leadership, lack of mentorship, lack of orientation as well as external factors which decreases job satisfaction and poorly impact retention.

Conclusion: We identified gaps related to psychological stress related to NPs in the hospital setting as well as retention. Lower levels of stress lead to improved job satisfaction and increase retention. Focus should be given to those factors to decrease psychological stress and promote retention.

Supported by:

Primary Presenter / email: **Fulgham, Laurel** / [lmfu227@uky.edu](mailto:lmfu227@uky.edu)  
**PhD Nursing Student**  
**Systematic Review**

Presentation **343**

Abstract Title: **Characteristics of Women with Peripartum Cardiomyopathy: A Retrospective Analysis of Hospital Admissions in Mississippi**

Author(s): R. Gambill, College of Nursing, U of Kentucky

**Abstract:** Background: Peripartum cardiomyopathy (PPCM) is a leading cause of maternal mortality and disproportionately affects African American women compared to their White counterparts. African American women are twice as likely to be diagnosed with PPCM and experience more severe disease symptoms. Despite these disparities, they remain underrepresented in PPCM research, limiting the development of targeted interventions to improve outcomes.

Purpose Statement: We aimed to identify clinical and demographic characteristics of women diagnosed with PPCM in Mississippi, where African American women constitute the majority of patients with PPCM.

Methods: This is a retrospective data analysis including women with the ICD-10 code for PPCM, with filters for demographic data from medical records (race, age, smoking status) and clinical data (hospital encounters, Emergency Department chief complaint, Emergency Department disposition, living status, and pro-BNP results). Age and Pro-BNP are reported as means and standard deviations. Race, smoking status, Emergency Department chief complaint and disposition, patient living status, and other diagnoses are reported in frequencies and percentages.

Results: There are 5,027 hospital admissions from 2013-2025 that represent 334 patients. The average age at diagnosis of PPCM is 29.6 years. African Americans (87%) are older than white women at the time of diagnosis. Most of the women never smoked. The most frequent ED chief complaint was shortness of breath and chest pain. As the dataset is finalized, correlations will be performed to complete the analysis.

Conclusion: Findings from this research will contribute to the development of strategies for early diagnosis, improved disease management, and better health outcomes for women at risk for PPCM, particularly among African American populations.

Supported by:

Primary Presenter / email: **Gambill, Rachel** / rga277@uky.edu  
**PhD Nursing Student**  
**Health Equity Research**

Presentation 344

Abstract Title: **Impact of Social Determinants of Health on Cardiovascular Disease Risk among Latinos**

Author(s): M. Iddrisu, College of Nursing, U of Kentucky; M. K. Rayens, College of Nursing, U of Kentucky; K. V. Key, College of Nursing, U of Kentucky; G. Lopez-Ramirez; G. Mudd-Martin, College of Nursing, U of Kentucky

**Abstract:** Background: U.S. Latinos have a high prevalence of multiple cardiovascular disease (CVD) risk factors and in the past decade have had a more rapid increase in CVD rates than other racial and ethnic groups. Social determinants of health (SDOH) have been linked to CVD risk but these associations in Latinos have been largely unexplored.

Aim: To examine associations among SDOH and CVD risk in U.S. Latinos.

Methods: This was a secondary analysis from 248 participants in the Corazon de la Familia (Heart of Family) study (83.1% female; 43.4±12.6 years of age). CVD risk was assessed using the Framingham Risk Score (FRS). SDOH indicators included marital status, education level, employment status, income, insurance, homeownership, and the Social Vulnerability Index (SVI) score. A multiple linear regression analysis was performed to examine associations of the FRS with SDOH indicators.

Results: The regression model was significant ( $F[8,239] = 4.818, p < .001$ ), accounting for 13.9% of the variance in FRS. Employment status ( $B = 0.267, p < .001$ ) and insurance status ( $B = 0.156, p = .030$ ) were significantly associated with higher FRS, indicating greater cardiovascular risk for unemployed and uninsured individuals.

Education, marital status, income, home ownership, and SVI were not significantly associated with FRS.

Conclusion: Employment and insurance status were positively associated with higher CVD risk in this sample of U.S. Latinos. Results support American Heart Association recommendations to assess SDOH when evaluating CVD risk. Future research is needed to determine long-term relationships between SDOH and CVD outcomes in Latinos.

Supported by: NIH/NINR grant R01NR016262

Primary Presenter / email: **IDDRISU, MOHAMMED** / imo245@uky.edu  
**PhD Nursing Student**  
**Community Research**

Presentation **345**

Abstract Title: **Noninvasive Measurements of Dehydration in Healthcare Workers: A Systematic Review**

Author(s): S. Owens, College of Nursing, University of Kentucky; M.J. Biddle, College of Nursing, University of Kentucky

**Abstract:** Background: Dehydration is a problem in healthcare workers because they are at an increased risk due to lack of access and regulations related to fluids in the work area. Signs and symptoms of dehydration such as headaches, dizziness, fatigue, and impaired cognition can alter worker performance and impact patient outcomes. Lacking a universal definition of dehydration prohibits standardized measurements. The purpose of this study is to synthesize current literature on non-invasive measurements of dehydration in healthcare workers.

Methods: A search was conducted in PubMed and CINAHL from 1991 to October 2024. PRISMA guidelines was used in this review process as well as Critical Appraisal Skills Programme (CASP) checklists for a summary of quality appraisal. The search string identified 2,727 articles. After de-duplication (N=141) and initial exclusion of title/abstract (N=2,527), 60 articles were retrieved and assessed for eligibility. Articles (N=52) were excluded for not including healthcare workers, measurement of dehydration, or for being expert opinion. A final total of eight studies that measured dehydration were included.

Results: Eight studies (N= 521) were included in this review with variation in methodology and sampling. The most common non-invasive measurements of dehydration were urine specific gravity, weight, and self-reported dehydration. There was a lack of evidence supporting reliability and validity of the measurements in the studies reviewed.

Conclusion: This review highlights the gaps and the paucity of evidence related to measurements of dehydration in healthcare workers. Finding a reliable and valid noninvasive measurement of dehydration in this population can safeguard patient outcomes.

Supported by:

Primary Presenter / email: **Owens, Sarah** / scow223@uky.edu  
**PhD Nursing Student**  
**Systematic Review**

**Presentation 346**

Abstract Title: **Quality of Life Disparities Among Black Patients with Heart Failure: The Role of Depressive Symptoms and Functional Status**

Author(s): A. Thapa, College of Nursing, U of Kentucky; M.J. Biddle, College of Nursing, U of Kentucky; D.K. Moser, U of Tennessee; Knoxville, TN

**Abstract:** Background: Black patients with heart failure (HF) have a higher physical and psychological distress which disproportionately worsens their quality of life (QOL) than those from other racial/ethnic groups. Black patients report higher levels of depressive symptoms. Higher levels of depressive symptoms can further worsen functional status and lower QOL.

Hypothesis: We hypothesized that depressive symptoms would predict QOL in Black patients with HF and that this relationship would be mediated by functional status.

Method: Using the RICH Heart Program HF Database, we included all 226 Black patients (57±12 years old, 49% male) with HF, who completed the Patient Health Questionnaire-9 to measure depressive symptoms, Duke Activity Status Index for functional status, and Minnesota Living with Heart Failure Questionnaire for QOL.

Mediation analysis was performed using the PROCESS macro.

Results: Depressive symptoms were directly associated with QOL (effect coefficient [c'] = 2.386, 95% confidence interval [CI] = 2.549, 3.450). There was a significant indirect effect of depressive symptoms on QOL mediated by functional status (ab=0.614, CI [0.406, 0.856]). Those with worse depressive symptoms had lower functional status (a = -0.901, p < 0.001), in turn, lower functional status was associated with worse QOL (b = -0.681 p < 0.001).

Conclusion: Depressive symptoms are directly associated with QOL and there also is an indirect association, mediated by functional status in Black patients with HF. Inequities in the management of HF among Black patients that contribute to these findings must be explored as the causes of the disparity in depressive symptoms are not yet known.

Supported by: RICH (Research and Interventions for Cardiovascular Health) Heart Program Heart Failure Database

Primary Presenter / email: **Thapa, Ashmita / ath280@uky.edu**  
**PhD Nursing Student**  
**Health Equity Research**

**Presentation 347**

Abstract Title: **Impact of social support on the quality of life of patients diagnosed with prostate cancer: A Systematic Review**

Author(s): Abubakari Wuni, College of Nursing, University of Kentucky; Adebola Adegboyega, College of Nursing, University of Kentucky

**Abstract:** Background: Prostate cancer diagnosis and treatment impact patient's well-being. The diversity of treatments leads to unfavorable experiences, increasing psychological strain and threatening their quality of life. However, strong social support has been associated with improved quality of life.

Aim: This review aimed to evaluate the impact of social support on the quality of life of prostate cancer patients.

Methods: Following PRISMA guidelines, we searched PubMed, CINAHL, and PsycINFO databases and included studies from 2001 to 2024 that assessed social support's impact on prostate cancer patients' quality of life, excluding those with other conditions. We evaluated the studies methodological quality with the JBI critical appraisal checklist.

Results: Seven (6 quantitative and 1 qualitative) articles were included in the review. The review highlighted that higher baseline social support was significantly associated with better quality of life. Satisfaction with social support was strongly correlated with a higher quality of life. Prostate cancer patients with stronger partner support and more diverse support networks reported better sexual and physical quality of life. While patients with unmet support needs had worse hormonal, sexual, and mental health. Findings from the qualitative study emphasized that patients valued unstructured social support from families.

Conclusion: This review underscores the significant role of social support in improving the quality of life for prostate cancer patients. Social support should be an integral part of treatment plans, and providers should refer patients to support services. Strengthening family connections through communication and involvement can improve emotional support and quality of life for prostate cancer patients.

Supported by: College of Nursing, University of Kentucky,

Primary Presenter / email: **Wuni, Abubakari** / awu229@uky.edu  
**PhD Nursing Student**  
**Systematic Review**

**Presentation 348**

Abstract Title: **Empowering Women's Health: Transforming Prenatal Care Through Clinical Judgement and Trauma-Informed Practices**

Author(s): Megan Miller BSN RN; Dr. Angela Clark, Assistance Professor UK College of Nursing

**Abstract:** Trauma informed care (TIC) is a component of compassionate practice which acknowledges the profound impact of trauma on individuals' lives and promotes healing through empathy, respect, and understanding. Pregnant women are exposed to a disproportionate amount of trauma which may lead to increased vulnerability to re-traumatization during obstetrics and gynecology appointments. Implementing TIC in prenatal care is essential to creating a safe, supportive environment for expecting mothers throughout pregnancy and labor. The University of Kentucky Midwife Clinic serves as an outstanding model of how to successfully implement TIC into prenatal care through a holistic approach to reproductive care, paving the way to reducing stigma around birth trauma, sexual abuse, and mental health. TIC is implemented into the practices of all clinic staff, leading to a new standard of care which should be implemented in all healthcare settings. The Clinical Judgement Measurement Model can be utilized to implement TIC as part of best practice by recognizing trauma cues, analyzing the impact of trauma, prioritizing hypotheses of avoiding traumatization, implementing interventions to prevent trauma, and evaluating the effectiveness of those interventions. By recognizing and addressing trauma, providers can create safe environments where patients feel understood and supported, which fosters trust and enhances their overall well-being. TIC not only improves patient outcomes by addressing the root causes of many physical and mental health issues, but it also strengthens the bond between patients and providers. This patient-centered approach is vital for promoting resilience, empowering individuals, and contributing to more effective, compassionate healthcare practices.

Supported by:

Primary Presenter / email: **Miller, Megan** / [megan.eilizabeth0416@gmail.com](mailto:megan.eilizabeth0416@gmail.com)  
**BSN Graduate**  
**Quality Improvement**

**Presentation 349**

Abstract Title: **Systemic Inflammation, Endothelial Dysfunction, and the Risk of Increased Periodontal Pocket Depth: the SOALS Study**

Author(s): O.M. Andriankaja, College of Dentistry, University of Kentucky, KY  
K. Guo, Center for Clinical Research and Health Promotion, School of Dental Medicine, Medical Sciences Campus, University of Puerto Rico, PR  
A Kantarci, The Forsyth Institute, Cambridge, MA  
H Hasturk, The Forsyth Institute, Cambridge, MA  
L.M. Shaddox, College of Dentistry, University of Kentucky, KY  
M. Mattos, College of Dentistry, University of Kentucky, KY  
K. Joshipura, School of Public Health, Ahmedabad University, India

**Abstract:** Objectives: Obesity is linked to periodontal disease (PD), but the mechanisms remain unclear. This study investigates whether systemic inflammation and endothelial dysfunction in obesity contribute to PD development/progression over three years in overweight/obese individuals.

Methods: We analyzed data from 617 overweight/obese adults (ages 40-65) without diabetes, enrolled in the San Juan Overweight Adults Longitudinal Study (SOALS). Serum levels of sICAM-1, sVCAM-1, IL-6, TNF- $\alpha$ , adiponectin, and hs-CRP, as well as probing pocket depth (PPD  $\geq$ 4mm) at baseline and follow-up, were assessed. Generalized linear models with robust standard errors were used to estimate associations between biomarker changes and changes in the percentage of sites with PPD  $\geq$ 4mm, adjusting for baseline factors such as age, gender, smoking, alcohol intake, education, physical activity, plaque index, and changes in BMI, cholesterol, HbA1c, and hypertension status.

Results: Of the 617 participants, 310 showed no change or worsening in periodontal outcomes, while 283 experienced improvements. In the worsening group, a 1 SD increase in sICAM-1 was associated with a higher percentage of sites with PPD  $\geq$ 4mm ( $\beta = 1.13$ ;  $p = 0.04$ ), suggesting a risk factor for progression. Higher adiponectin levels were associated with a decreased risk of worsening outcomes ( $\beta = -1.04$ ;  $p = 0.03$ ). No significant associations were found for sVCAM-1, IL-6, TNF- $\alpha$ , or hs-CRP.

Conclusions: Increased sICAM-1 levels were associated with greater periodontal progression, while higher adiponectin levels were protective. These findings suggest that endothelial dysfunction (via sICAM-1) and adiponectin may influence periodontal outcomes in overweight/obese individuals.

Supported by: National Institute of Dental and Craniofacial Research Grant R01DE020111, the National Institute on Minority Health and Health Disparities Grants U54MD007600, 2U54MD007587, and S21MD001830 of the National Institutes of Health.

Primary Presenter / email: **Andriankaja, Oelisoa Mireille** / oelisoa.andriankaja@uky.edu  
**Faculty**  
**Clinical Research**



Presentation **350**

Abstract Title: **Impact of Sleep on Oral Microbiome**

Author(s): Pratishtha Mishra; Manuela Maria Viana Miguel, Lorie Snow; Sree Kirakodu; Ian Boggero; Marcia Rojas; Luciana Shaddox, Departments of Oral Health Practice, U of Kentucky

**Abstract:** Saliva samples were collected from 101 individuals, and they were clinically categorized as either periodontally healthy (H) or periodontally diseased (P) based on the 2018, American Academy of Periodontology classification of periodontal and peri-implant diseases. Sleep quality was assessed using the National Institute of Health- PROMIS-8a Sleep Disturbance instrument. Participants were divided into four groups: healthy-good sleep (H-GS), healthy-poor sleep (H-PS), periodontally diseased-good sleep (P-GS), and periodontally diseased-poor sleep (P-PS). Microbial sequencing was performed on the salivary samples, and sequences were clustered into phylotypes and assigned taxonomic classifications using the Human Oral Microbiome Database.

Results: Beta diversity analysis using the Bray-Curtis dissimilarity measure revealed significant differences between the microbiome profiles of periodontally diseased individuals with good sleep (P-GS) and poor sleep (P-PS) ( $p=0.006$ ). Moreover, healthy individuals also exhibited different microbiome profiles based on their sleep quality ( $p=0.032$ ). After adjusting for sex and age, several bacterial species were significantly elevated in individuals with periodontal disease and poor sleep quality (P-PS) compared to those with good sleep quality (P-GS). Specifically, *Prevotella*\_sp increased by 3.3-fold, *Campylobacter* by 3.2-fold, and *Lactobacillus* by 2.8-fold ( $p<0.001$ ). In contrast, in the crude (unadjusted) analysis, TM 7-HMT-346 was significantly elevated ( $p<0.05$ ) in healthy individuals with poor sleep quality (H-PS).

Conclusion: Within the limits of this study, we can conclude that poor sleep quality significantly alters the oral microbiota, regardless of periodontal health status. Sleep disturbances may contribute to oral dysbiosis, potentially exacerbating inflammation and increasing the risk of periodontal disease.

Supported by:

Primary Presenter / email: **Mishra, Pratishtha** / p.mishra@uky.edu  
**Faculty**  
**Clinical Research**

Presentation **351**

Abstract Title: **Artificial Intelligence in Dentistry: Perspectives from Social Media**

Author(s): N.M. Elwany, Department of Oral Health Science, U of Kentucky; A.S. Elnoshokaty, Information and Decision Sciences Department, California State University

**Abstract:** Artificial Intelligence (AI) is transforming dentistry by improving clinical efficiency, patient care, and administrative processes while reducing costs. However, its successful integration depends on understanding dentists' perspectives, which can guide the development of ethical and effective AI solutions. Social media platforms like X (formerly Twitter) and Reddit provide a valuable space for dentists to share their opinions, expectations, and concerns about AI in real time.

The study analyzed 54,796 social media posts from 713 self-identified dentists between November 2022 and February 2025, using Natural Language Processing (NLP) and machine learning techniques, including OpenAI's GPT model, to identify key themes and sentiments. The findings revealed diverse perspectives on AI in dentistry. Many dentists recognize AI's potential in clinical radiology for enhancing image analysis and diagnostics but express concerns about its reliability and accuracy. While AI is seen as beneficial for treatment planning and administrative tasks, its role in direct patient care remains debated. Trust in AI varies, with concerns about decision-making automation, error accountability, and data security. AI's ability to streamline insurance claims processing is acknowledged, though some worry about potential biases in automated systems. Data privacy and cybersecurity are also prominent concerns, especially with the growing reliance on AI.

These insights highlight the need for AI developers, policymakers, and dental organizations to address dentists' concerns and ensure AI tools align with real-world dental practices. By doing so, AI can be effectively integrated into dentistry, balancing innovation with ethical considerations and practical needs.

Supported by:

Primary Presenter / email: **Elwany, Nelly** / nmel228@uky.edu  
**Faculty**  
**Community Research**

**Presentation 352**

Abstract Title: **Standardizing a Brief Psychological Physical Self-Regulation Intervention for Chronic Masticatory Muscle Pain Disorders**

Author(s): V. Patel, College of Arts and Sciences, U of Kentucky; S. Long, College of Health Sciences, U of Kentucky; C. Brown, College of Dentistry, U of Kentucky; I. Boggero, College of Dentistry, U of Kentucky.

**Abstract:** Chronic masticatory muscle pain disorders (MMPD) affect 5-12% adults. This presents a serious public health issue. One brief psychological treatment for MMPD has been physical self-regulation (or, PSR). PSR consists of two 50-minute sessions in which patients are taught clenching awareness, jaw relaxation exercises, and diaphragmatic breathing. The combination of PSR and standard dental care (SDC) has been a promising intervention for MMPD relative to SDC alone. Yet, PSR utilization is low, with less than 50% of eligible patients beginning PSR when offered. Finding ways to make the intervention more accessible remains important. One possibility is to offer PSR via telehealth (PSR-TH), and preliminary data demonstrate strong feasibility/acceptability for PSR-TH. Yet, to be widely disseminated, it's important to establish that PSR-TH can be delivered in a standardized way; different providers should be able to deliver the PSR-TH intervention consistently using a treatment manual. Three different providers will be given the same PSR-TH manual and be asked to deliver intervention to actual orofacial pain patients in a multidisciplinary treatment setting. Then, trained study staff will listen to the audio recordings and assign points according to how many components of the manual were accurately delivered. Although the study is still ongoing and data are not currently available, the poster in April will present all available data on that point. Results from the study will inform the scalability of a brief psychological intervention for MMPD, paving the way for future dissemination/implementation studies.

Supported by: NIH award: K23DE031807

Primary Presenter / email: **Patel, Viddhi** / [vmpa229@uky.edu](mailto:vmpa229@uky.edu)  
**Undergraduate Student**  
**Clinical Research**

**Presentation 353**

**Abstract Title: Chronic Overlapping Pain Conditions Predict Pain Intensity and Fatigue in Young Adults with Temporomandibular Disorder**

**Author(s):** P. E. Ash, Department of Psychology, U of Kentucky; C. Brown, Department of Research and Graduate Studies, U of Kentucky; M. Ramiseti, College of Public Health, U of Kentucky; M. Chakarvarty, Division of Orofacial Pain, College of Dentistry, U of Kentucky; C. D. King, Department of Pediatrics, University of Cincinnati; I.A. Boggero, Department of Oral Health Science, Division of Orofacial Pain, College of Dentistry, Department of Psychology, U of Kentucky

**Abstract:** Temporomandibular disorder (TMD) is a prevalent chronic pain condition that is known to co-occur with other chronic overlapping pain conditions (COPCs) (fibromyalgia, chronic lower back pain, temporomandibular disorder, irritable bowel syndrome, chronic migraine headaches, chronic tension-type headaches, myalgic encephalomyelitis/ chronic fatigue syndrome, painful endometriosis, urological chronic pelvic pain syndromes, and vulvodynia). Chronic pain patients are known to experience a cluster of symptoms acronymized as SPACE (S = sleep disturbance, P = pain, A = affect that is negative/depression and anxiety, C = cognitive impairment, E = energy depletion/fatigue). Despite these symptoms being strongly associated with chronic pain in older and middle-aged adults, the association between SPACE symptoms and COPCs in young adults (ages 18-34) with chronic TMD remains unexplored. Young adulthood is a significant developmental period in a person's life, such that chronic pain may affect young adults differently than middle-aged or older adults. The goal of this study is to examine the associations between the number of COPCs and SPACE symptoms in young adults with TMD. 26 young adults (Mean age = 26.85, SD = 4.68, 96.2% female) with TMD and at least one other COPC were recruited and completed daily surveys assessing COPCs and SPACE symptoms for 14 days. Pearson's correlation showed that two space symptoms had significant associations with the number of COPCs: pain intensity ( $r = 0.447$ ,  $p = 0.022$ ) and fatigue ( $r = 0.567$ ,  $p = 0.003$ ). These results indicate that chronic pain in young adults may have symptom-specific associations and can inform future treatment.

**Supported by:** This publication was supported by the National Center for Research Resources and the National Center for Advancing Translational Sciences, National Institutes of Health, through Grant UL1TR001998. This research was also supported by the National Institute Of Dental & Craniofacial Research of the National Institutes of Health under Award Number K23DE031807. The content is solely the responsibility of the authors and does not necessarily represent the official views of the NIH.

**Primary Presenter / email:** **Ash, Peyton** / peas222@uky.edu  
**Undergraduate Student**  
**Clinical Research**

**Presentation 354**

Abstract Title: **Randomized Clinical Trial of a Brief Psychological Intervention for Chronic Orofacial Pain**

Author(s): S. Habib, College of Dentistry, U of Kentucky; F. Hall, Department of Psychology, U of Kentucky; M. Baker, Department of Psychology, U of Kentucky; C. Brown, College of Dentistry, U of Kentucky; I. A. Boggero, College of Dentistry, U of Kentucky

**Abstract:** Complex orofacial pain (OFP) conditions often require multidisciplinary care for optimal management, however, patient willingness to participate in randomized clinical trials (RCTs) of psychological interventions within an orofacial pain clinic remains unknown. This study sought to describe recruitment/retention trends for an RCT of behavioral interventions for OFP and uncover reasons for non-participation. Patients were treatment-seeking patients at a tertiary, university-affiliated OFP clinic. Those with pain aggravated by stress or parafunctional habits were referred to the clinical psychology team to learn behavioral strategies for coping with pain. At that appointment, eligible participants were introduced to an RCT comparing two brief telehealth interventions for chronic OFP (Physical Self-Regulation vs. psychoeducation). Interventions consisted of 2 50-min sessions 2 weeks apart. Participants were asked to complete surveys at baseline (before the intervention), after both intervention visits, and 2 weeks and 3 months following the second visit. If participants chose not to participate, their reasons for nonparticipation were noted. The trial is ongoing, and the abstract reports current data. The poster will include updated data. During a 5-month recruitment period, 97 patients were approached and 27 (27.84%) agreed to participate. Most common reasons for non-participation were: being excluded due to psychiatric symptoms (10%) and preferring in-person vs. telehealth treatment (8.57%). Among participants who completed the study, 90% completed all assessments. These preliminary results of an ongoing RCT suggest that recruitment of OFP patients into behavioral interventions for OFP is feasible and pave the way for future such studies.

Supported by: NIH, NIDCR, Award Number K23DE03180.

Primary Presenter / email: **Hall, Faith** / Fmha226@uky.edu  
**Undergraduate Student**  
**Clinical Research**

**Presentation 355**

Abstract Title: **Investigating Emergency Department Use for Non-Traumatic Dental Conditions in Kentucky: A Study on Social Vulnerability**

Author(s): J. Bryant, Martin-Gatton College of Agriculture, Food and Environment, U of Kentucky; C. Brown, College of Dentistry, U of Kentucky; M. V. Miguel, College of Dentistry, U of Kentucky; R. Ingram, College of Public Health, U of Kentucky; M. Kirakodu, College of Dentistry, U of Kentucky; P. Stein, College of Dentistry, U of Kentucky; L. Shaddox, College of Dentistry, U of Kentucky

**Abstract:** Oral health is integral to overall health and is associated with systemic conditions such as cardiovascular disease, diabetes, and mental health disorders. Kentucky ranks poorly in both oral and overall health, ranked 41st in overall health, 45th in diabetes, and 50th in persons over 65 that have lost all their teeth. Limited access to dental care forces many individuals, especially marginalized populations, to seek treatment for non-traumatic dental conditions (NTDCs) at emergency departments (EDs). This costly and ineffective trend led to over 27,000 visits and \$44 million in charges in 2019, with an average ED visit costing over \$1,500 compared to \$90-\$200 for definitive dental care.

Despite a 2019 state-level report on ED use for NTDCs, no recent research examines variations across the state, social and structural factors that may be contributing to ED use, and the impact of the COVID-19 pandemic. Our ongoing study investigates ED use for NTDCs from 2019 to 2023, addressing key research questions about prevalence, patient demographics, associated costs, and contributing social and structural factors.

This project has three aims: (1) survey NTDC ED visits across Kentucky, analyzing demographic and geographic patterns; (2) evaluate correlations between ED use and social vulnerability/systemic factors such as the Social Vulnerability Index and workforce shortages; and (3) assess patient-level social determinants of health data from UK HealthCare EDs.

Findings from this study will provide essential data to inform policy changes, outreach efforts, and oral health workforce development to improve oral health outcomes and care equity in Kentucky.

Supported by: Supported by the NIH National Center for Advancing Translational Sciences through grant number UL1TR001998. The content is solely the responsibility of the authors and does not necessarily represent the official views of the NIH.

Primary Presenter / email: **Bryant, Jessie** / jbbr261@uky.edu  
**Undergraduate Student**  
**Health Equity Research**

Presentation **356**

Abstract Title: **"Methods to Assess Nutritional Status in a Dental Setting: A Literature Review"**

Author(s): E. Forsthoefel, Department of Dietetics and Human Nutrition, U of Kentucky; R. Morgan, Medical Center Library, U of Kentucky; M.V. Rojas-Ramirez, M.V., DDS, MS, MPH, College of Dentistry, U of Kentucky.

**Abstract:** Background and aim: Nutrition and oral health are deeply interconnected, with significant implications for systemic health and quality of life. Poor oral health increases health risks, perpetuating a cycle of dietary deficiencies and declining overall health. Despite this connection, dental practices do not routinely utilize standardized tools to assess nutritional status, limiting opportunities for effective intervention to improve patient outcomes. The aim of this study is to identify and review the most utilized nutrition-related surveys in dental settings.

Methods: A search was conducted in the PubMed database using a combination of medical subject heading terms and natural language. Inclusion criteria applied: 1) English language, 2) Human subjects, 3) Adults, and 4) Article type.

Results: The initial search identified 7,967 articles. After reviewing the inclusion criteria, 814 were kept. We are currently conducting a title/abstract review to narrow the number of articles and results will be available for poster presentation.

Conclusions: This review will provide recommendations on nutrition tools that can be easily incorporated in the routine assessment of dental patients.

Supported by: This project received funding from the Research and Extension Experiences for Undergraduates, [grant no, 2019-05108], from the U.S. Department of Agriculture, National Institute of Food and Agriculture.

Primary Presenter / email: **Forsthoefel, Emma** / efo242@uky.edu  
**Undergraduate Student**  
**Literature review**

**Presentation 357**

Abstract Title: **Oral Function Assessment Tools and Their Impact on Nutrition in Dentistry**

Ami Patel<sup>1</sup>, Rebecca Morgan<sup>2</sup>, Rojas-Ramirez<sup>3</sup>, M.V., DDS, MS, MPH

Author(s): 1. Dietetics and Human Nutrition, 2. College of Dentistry, 3. College of Dentistry

**Abstract:** Background: Oral function is essential for maintaining proper nutrition and overall health, as impairments in mastication, swallowing, and saliva production can lead to malnutrition and other health complications. Despite the strong connection between oral function and nutrition, assessment tools are often underutilized in clinical settings, limiting healthcare providers to identify and address nutrition related oral issues. Study purpose/objective: This study aims to identify assessment tools used to measure oral function in clinical populations and examine their impact on nutritional outcomes.

Methods: A review of the literature was conducted using PubMed to identify studies on oral function assessment tools and their impact on nutritional outcomes in adult populations. Inclusion criteria included: 1) English language, 2) Human subjects, 3) Adults, and 4) Article type. The query used was, "masticat\*[tiab] OR "jaw function\*" [tiab] OR "Mastication"[Mesh] AND (assess\*[tiab] OR tool\*[tiab] OR scale\*[tiab] OR checklist\*[tiab] OR Questionnaires and Surveys[MeSH Terms])"

Results: This search initially identified 52,617 articles. After applying the inclusion criteria, 457 articles were kept. We are currently conducting a title/abstract review to narrow the number of articles and results will be available for poster presentation.

Conclusion: Integrating oral function assessment tools into routine clinical practice has the potential of improving early detection of nutritional risk and improve patient outcomes. More research and awareness are needed to promote these tools in the healthcare settings.

Supported by: This project received funding by the Research and Extension Experiences for Undergraduates, [grant no. 2019-05108], from the U.S. Department of Agriculture, National Institute of Food and Agriculture.

Primary Presenter / email: **Patel, Ami** / ampa270@uky.edu  
**Undergraduate Student**  
**Clinical Research**



**Presentation 358**

Abstract Title: **Protocol Paper for an Efficacy Trial of Brief Behavioral Interventions for Chronic Orofacial Pain**

Author(s): N. Patel, Department of Psychology, U of Kentucky; E. K. Sanchez, Department of Psychology, U of Kentucky; V. D. Vaishakhi, Department of Oral Health Practice, Division of Orofacial Pain, U of Kentucky College of Dentistry; I. A. Boggero, Department of Oral Health Practice, Division of Orofacial Pain, U of Kentucky College of Dentistry

**Abstract:** Chronic masticatory pain disorder (MMPD) is muscle pain in the temporomandibular area lasting over three months. MMPD is managed through a combination of standard dental care and psychological intervention. One such intervention is physical self-regulation (PSR). PSR utilization is low when offered in person, but the efficacy of a telehealth (TH) version of PSR has not been established, nor has PSR ever been compared to an active control intervention to see if PRS effects are greater than nonspecific treatment effects. Establishing the efficacy requires running a full-scale efficacy trial of a behavioral intervention in a multidisciplinary tertiary orofacial pain clinic. The goal of this abstract/poster is to present a protocol describing the methodology for running such a trial. Treatment-seeking patients at the University of Kentucky Orofacial Pain Clinic with MMPD will be randomly assigned to two telehealth sessions of either PSR-TH or a control intervention (N = 52 per group). Patients will provide baseline biopsychosocial moderator data (week 0), treatment feasibility data (week 3), mediator data (week 5), and outcome data (pain intensity, pain interference, and quality of life (weeks 5 and 15). This study will evaluate the efficacy of PSR-TH and control telehealth interventions in patients with MMPD. Potential moderators and mediators of PSR-TH treatment effects will also be identified. If successful, such a trial will be among the first to examine the efficacy and mechanisms of behavioral telehealth interventions in patients with MMPD, which have potential for improving access to care for patients with MMPD.

Supported by: Research reported in this publication was supported by the National Institute Of Dental & Craniofacial Research of the National Institutes of Health under Award Number K23DE031807. The content is solely the responsibility of the authors and does not necessarily represent the official views of the National Institutes of Health.

Primary Presenter / email: **Patel, Nidhi** / npa277@uky.edu  
**Undergraduate Student**  
**Clinical Research**  
**Pain Management**

**Presentation 359**

**Abstract Title: Palatal Wound Healing Comparison Between Diabetics and Non-Diabetics Patients**

**Author(s):** Rios A\*, Department of Dentistry, U of Kentucky, Bonafe ACF, Department of Dentistry, U of Kentucky, Miguel MMV, Department of Dentistry, U of Kentucky, Mathias-Santamaria IF, Department of Dentistry, U of Kentucky, Kirakodu S, Department of Dentistry, Casarin RCV, Department of Dentistry, Shaddox LM, Department of Periodontology, U of Kentucky, Santamaria MP, Department of Periodontology, U of Kentucky .

**Abstract:** Literature has shown that there is a difference in wound healing between diabetic and non-diabetic patients. DM-diagnosed patients are more prone to factors - such as inflammation - that negatively impact tissue repair timeframe. Despite the vast literature on dermal wounds, there is a lack of studies assessing DM impacts on oral wound healing and possible mechanisms related to this condition. Study aims to assess the oral mucosa healing between diabetic and non-diabetic patients after oral surgery by clinical and host immunological response. Twenty-four, 12 diabetic (DM) and 12 non-diabetics (NDM), were already recruited. All patients underwent a standardized surgical procedure where a palatal mucosa graft was harvested and used to correct patients mucogingival defects. The palatal wound was analyzed by clinical measurements as remaining wound area, epithelialization rates, and tissue thickness until 90 days postoperatively. The inflammatory exudate from the area was collected on days 3 and 7 after surgery to assay the following inflammatory biomarkers and growth factors: IL1 $\beta$ , IL6, IL10, IL3 TNF $\alpha$ , MCP-1, MMP-2, MMP-9, TIMP-1, TIMP-2, EGF, FGF-2, PDGF-BB, VEGF- $\alpha$ . Preliminary results showed greater wound closure and EPT rates in NDM compared to DM group on day 14. Moreover, a delay in tissue thickness recovery was observed in the DM subjects on day 90 compared to initial measurements Higher MMP-9 concentration was detected in the DM group on days 3 and 7 after surgery. A decrease in TIMP-1 levels was observed in both groups over time whereas IL-13 and TNF $\alpha$  reduced in the NDM group 7 days postoperatively.

Supported by:

Primary Presenter / email: **Rios, Angelica / angelica.rios@uky.edu**  
**Professional Student (MD, PharmD, DMD, PT)**  
**Clinical Trial**

**Presentation 360**

Abstract Title: **Factors Influencing Opioid Prescription in a Dental Academic Setting: A Qualitative Analysis**

Author(s): A. G. Saltz, College of Dentistry, U of Kentucky; C.S. Miller, Department of Oral Health Practice, U of Kentucky; D.R. Oyler, Department of Pharmacy Practice and Science, U of Kentucky; M.V. Rojas-Ramirez, Department of Oral Health Practice, U of Kentucky

**Abstract:** Background: Opioid analgesics are frequently prescribed by dentists, most commonly after tooth extraction. However, non-opioids such as acetaminophen and nonsteroidals are more effective and safer analgesics. Decision-making around opioid prescribing among dentists has not been well-defined. This study aimed to identify factors influencing dental providers' decision to prescribe opioids after a tooth extraction. Methods: Structured interviews with 14 participants (8 faculty and 6 residents) were conducted and transcribed using TEMI®. Four different investigators independently coded transcriptions using a grounded theory approach. Qualitative analysis was conducted on NVivo, allowing for the extraction of themes influencing opioid prescribing. Results: Three main themes were found to influence opioid prescribing: 1) beliefs about clinical judgment, 2) beliefs about patient's medical outcomes, and 3) perceptions of practice environment and training. Conclusions: The findings from this study are consistent with other research showing opioid prescribing is multifactorial. Dental providers' assessment of the procedure, the patient characteristics, and the practice environment guide prescribing decisions in a clinical setting and can be effective intervention targets to reduce dental opioid prescribing. Practical Implications: Non-opioid analgesics are the first line of treatment for acute post-procedure pain management. However, opioid prescriptions after tooth extractions are common. Tailored interventions targeting influencing factors may facilitate a reduction in dental opioid prescribing while maintaining adequate pain management across practice settings.

Supported by: This study was supported by the Office of the Vice President for Research University of Kentucky Igniting Research Collaborations 2020. The ongoing clinical trial is supported by the National Institute of Dental and Craniofacial Research (NIDCR), with the award number UH3DE032621 and clinical trial number NCT06275191.

Primary Presenter / email: **Saltz, Alyssa / agsa242@uky.edu**  
**Professional Student (MD, PharmD, DMD, PT)**  
**Translational Research/Science**

**Presentation 361**

Abstract Title: **Impact of 3D-Printed Model Designed for Apicoectomy Training on User's Knowledge, Confidence, and Interest**

Author(s): Luciana Shaddox, D.D.S., M.S., Ph.D, College of Dentistry, U of Kentucky; Matthew D. Jacobson, D3 Dental Student, College of Dentistry, U of Kentucky

**Abstract:** Background: Surgical typodonts that simulate failed root canal treatments (RCTs) requiring surgical intervention can cost between \$100 and \$500 and are consumable, unlike traditional typodonts. As a result, DMD students receive limited hands-on training in apicoectomy procedures before graduation, with many residents performing the procedure on live patients for the first time. This study aimed to create cost-effective surgical training models for root tip resection and assess the impact on participants' knowledge of the procedure, confidence in their ability to perform it, and interest in pursuing further training.

Methods: The training model was designed using CAD/CAM technology. Dental students from the first to fourth year performed the procedure on the 3D-printed models, evaluating their effectiveness. Participants completed an anonymous survey before and after a lecture, rating their knowledge, confidence, and interest in the apicoectomy procedure. They then engaged in hands-on training. A final survey was taken to assess the same criteria.

Results: Model is finalized and functional. Final stages of training are being conducted now. However, initial assessment by students of the new model show high acceptance of the model with significant reports of improvements in participants' knowledge, confidence and interest by the trained students.

Conclusion: The use of cost-effective, 3D-printed apicoectomy models have the potential to significantly enhance dental students' knowledge, confidence, and interest in the procedure. These models represent a valuable tool for improving surgical training in endodontics, especially for students with limited access to expensive typodonts.

Future research should further explore effectiveness for residents.

Supported by:

Primary Presenter / email: **Jacobson, Matthew / mdja229@uky.edu**  
**Professional Student (MD, PharmD, DMD, PT)**  
**Scholarship of Teaching & Learning**

**Presentation 362**

Abstract Title: **The 2023 Kentucky Early Learners Oral Health Survey of Caries Among Children Ages 2-5**

Author(s): B. Patino, College of Dentistry, U of Kentucky; C. Brown, College of Dentistry, U of Kentucky; L.M. Shaddox, College of Dentistry, U of Kentucky; M. Kirakodu, College of Dentistry, U of Kentucky; R. Adatorwovor, College of Public Health, U of Kentucky; R. Singer, College of Dentistry, U of Kentucky; L. James, Kentucky Department of Public Health; J. Hasch, College of Dentistry, U of Kentucky; J. McKee, Kentucky Department of Public Health; P. Stein, College of Dentistry, U of Kentucky

**Abstract:** This study aimed to provide a 2023 benchmark of the prevalence of dental caries among children ages 2-5 in Kentucky to identify populations most at risk. From January through October of 2023, 6660 children ages 2-5 were screened in 106 of Kentucky's 120 counties categorized into 8 geographic regions. Local dental hygienists were recruited as screeners and were calibrated to screen for dental caries during a training event in December 2022. Rates of caries experience, untreated and treated caries were calculated for the overall sample and within specific populations based on geographic region, sex, age, race, ethnicity, screening facility type, and rural/urban designation of screening location. Mantel-Haenszel statistics were employed to compare proportions of caries. A multiple logistic regression model was used to evaluate the comparative strength across factors associated with increased caries rates. The overall prevalence for caries experience was 34.6 percent and untreated decay was 21.5 percent, which is considerably higher than the national average. There is a significant association between age and all three categories of caries with five-year olds having the highest risk. Head Start and other facility types, Eastern and South Central regions and rural location were also associated with increased rates of all caries categories. Untreated dental care is associated with various social, demographic and geographic factors, underscoring their impact on access to care. In conclusion, dental caries among young Kentucky children is a significant public health problem warranting further investigation into factors influencing outcomes and barriers to oral health care.

Supported by: Funded by Kentucky Department for Public Health and by the NIH National Center for Advancing Translational Sciences through grant number UL1TR001998. The content is solely the responsibility of the authors and does not necessarily represent the official views of the NIH.

Primary Presenter / email: **Patino, Brianna** / brpa233@uky.edu  
**Professional Student (MD, PharmD, DMD, PT)**  
**Clinical Research**

**Presentation 363**

Abstract Title: **Association of dental caries and socioeconomic status utilizing a composite index**

Author(s): Kaple, L., MS, Rojas-Ramirez, M.V., DDS, MS, MPH, College of Dentistry, U of Kentucky

**Abstract:** Background and aim: Socioeconomic status (SES) can be measured in many ways: income, education, and neighborhood of residence. The Area of Deprivation Index (ADI) is a cluster of contributing variables that allows for neighborhood ranking based on SES. The literature suggests an association of SES and dental caries. However, no study has tested this association utilizing this composite index. The aim of this study is to evaluate caries prevalence across ADI.

Methods: A chart review identified 7055 patients who came to the College of Dentistry between June 2021 and September 2022. Their demographic, address, and tooth findings data were extracted. ADI data were obtained following instructions based on the Neighborhood Atlas website. Independent T-test, Chi-square test, and ANOVA were used to determine the association between the caries and levels of ADI.

Results: After obtaining tooth data, a total of 1195 records were available for analyses. The mean age was 40.5 (14) with 58.7 % being females (n=702) and 62.7% (n=749) being White. The mean ADI was 4.3 (2.8). Mean total caries was 5.1 (5.1) ranging from 1-30 caries per individual.

Conclusions: Analyses will be finalized for poster presentation.

Supported by:

Primary Presenter / email: **Kaple, Logan** / lka259@uky.edu  
**Professional Student (MD, PharmD, DMD, PT)**  
**Clinical Research**

**Presentation 364**

Abstract Title: **Kentucky Dental Workforce Characteristics and Impact on Vulnerable Populations**

Author(s): B. Vickery, University of Kentucky College of Dentistry; L. Shaddox, University of Kentucky College of Dentistry; C. Brown, University of Kentucky College of Dentistry; R. Ingram, University of Kentucky College of Public Health; M. Kirakodu, University of Kentucky College of Dentistry

**Abstract:** Kentucky has one of the poorest oral health in the US. Kentucky is the number 8 in the lowest rates of dental visits and and second in the country with the highest rates in edentulism. One of the factors that may be associated with lack of access to care is dental workforce distribution. The aim of this study is to examine characteristics of the state of Kentucky's dental workforce (dentists and dental hygienists) using county-level and state-level data and analyze correlations between these characteristics and oral health utilization as well as oral health status by examining Medicaid claims data as well as state oral health data available on online platforms. Preliminary data shows a negative correlation of urgent care and and provider density, whereas a positive correlation was found of preventive care and provider density. We also found that social vulnerability is positively associated with urgent care and negatively associated with preventive care. Next step of this study will be to evaluate workforce data against other variables within the social vulnerability themes as well as reports of dental workforce availability from 2017 until 2022. The results of this study will be able to provide answers to the questions of why vulnerable populations experience such poor oral health outcomes when compared with the national average and understand the barriers to utilization of services in the state, with regards to provider factors like distribution, Medicaid enrollment, data, and social vulnerability by county.

Supported by: Funding from UKCD

Primary Presenter / email: **Vickery, Ben** / [bdvi224@uky.edu](mailto:bdvi224@uky.edu)  
**Professional Student (MD, PharmD, DMD, PT)**  
**Community Research**

**Presentation 365**

Abstract Title: **Self-Reported Opioid Use and Disposal Among Adolescents and Young Adults After Tooth Extraction**

Author(s): S. W. Li, College of Pharmacy, U of Kentucky; D. R. Oyler, Department of Pharmacy Practice & Science, U of Kentucky; M.V. Rojas, Department of Oral Diagnosis, Medicine, and Radiology, U of Kentucky

**Abstract:** Many healthy, young individuals' first exposure to opioids is from a dental prescription issued after tooth extraction. Because many of these prescriptions are unused or partially used, diversion is a common source of misused or abused opioids among adolescents. Almost 1 in 7 adolescents prescribed controlled medications have traded, sold, given away, or loaned these medications. Adolescents who have diverted medications are also more likely to develop substance use disorders. The goal of this project is to better characterize medication use and prescription opioid disposal among adolescents and young adults after tooth extraction. Self-reported opioid use and disposal practices will be extracted from an existing survey completed by approximately 450 adolescents and young adults undergoing tooth extraction in academic and community oral surgery practices participating in the Alternatives to Dental Opioid Prescribing After Tooth Extraction (ADOPT) study (NCT06275191). Full results, including observed differences by practice setting, sex, and age (i.e., adolescent vs. young adult), will be analyzed using chi-squared tests and will be presented at the conference.

Supported by: National Institute of Dental and Craniofacial Research (NIDCR) award: UH3DE032621

Primary Presenter / email: **Li, Sophia / swli225@uky.edu**  
**Professional Student (MD, PharmD, DMD, PT)**  
**Translational Research/Science**  
**Alcohol/Substance Abuse**



**Presentation 366**

Abstract Title: **Integration of Diabetes and Oral Care in Kentucky**

Author(s): G. Thompson, College of Dentistry, U of Kentucky; L. Shaddox, Center for Oral Health Research, College of Dentistry, U of Kentucky; C. Brown, Center for Oral Health Research, College of Dentistry, U of Kentucky

**Abstract:** Kentucky has one of the highest rates of diabetes prevalence and one of the highest rates of dental disease prevalence. By looking at various sets of data, a connection can be made between the two. The purpose of this study is to correlate diabetes data with oral and medical health care data in the different counties in Kentucky. Data from the Centers for Disease Control and Prevention (CDC), the United States Census, and the Agency for Toxic Substances and Disease Registry (ATSDR) was evaluated. The data was broken down for each of the 120 counties of Kentucky, also designated as rural and urban counties. The prevalence of diabetes was positively associated with the prevalence of tooth loss in Kentucky ( $r=0.9$ ,  $p<0.0001$ ) and negatively associated with dental visits ( $r=-0.88$ ,  $p<0.0001$ ). It was also observed that rural counties had higher diabetes prevalence, lower dental visits, and higher tooth loss compared to urban ones ( $p<0.001$ ). There were also positive correlations of Social Vulnerability Index (SVI) themes and tooth loss and diabetes, and negative correlations with dental visits ( $p<0.001$ ). Further evaluation of different sets of data and greater breakdown of SVI themes is warranted to strengthen the understanding and mitigate possible risk factors associated with diabetes and oral health and better integrate care between these two diseases.

Supported by:

Primary Presenter / email: **Thompson, Gabrielle** / [gjth226@uky.edu](mailto:gjth226@uky.edu)  
**Professional Student (MD, PharmD, DMD, PT)**  
**Public Health**

Presentation **367**

Abstract Title: **Evaluating Outcomes and Barriers of Dental Care in Eastern Kentucky; Insights from the RMC Outreach Mobile Program**

Author(s): Himala Gonzales, Courtney Brown, Dr. Daria (Nikki) Stone, and Dr. Luciana Shaddox.

**Abstract:** Kentucky is ranked 45th among all U.S. states in overall health, 9th for oral cancer and 5th in number of teeth lost to oral disease. It has a very high child poverty rate, low levels of education, and high unemployment rates. Although many children are enrolled in Medicaid, only 50 percent utilize dental services. Most rural regions present a long history of oral disease and increasing caries rates in children. Most counties in the Eastern and southeastern/central regions present the highest level of overall vulnerability, with socioeconomic status being an important driver here. Marginalized and underserved groups in the state face additional barriers to oral health contributing to reduced access to care. Mobile Care Units are utilized to serve areas of the state where access to care is an issue. However, barriers to underutilization of these services are not fully understood. Specifically, in rural Appalachia, multiple factors contribute to the underutilization of mobile dental services (such as the Ronald McDonald Mobile Care (RMC) unit). Barriers such as limited awareness of available services, lack of reliable transportation, economic constraints, and cultural factors may prevent individuals from accessing necessary dental care. Through in-depth interviews with both RMC staff and local community members, as well as evaluation of programmatic data from this unit, this research will aim to identify these specific barriers and explore how they intersect within the context of rural health disparities. Examining these factors hopes to provide recommendations to improve dental care access and health outcomes for this underserved population.

Supported by:

Primary Presenter / email: **Gonzales, Himala** / [hjgo230@uky.edu](mailto:hjgo230@uky.edu)  
**Graduate Student**  
**Community Research**  
**Disparities**

**Presentation 368**

Abstract Title: **Water Sorption and Solubility of New Resin Infiltrate**

Author(s): M. Conlin, Department of Pediatric Dentistry, U of Kentucky  
G. Hawk, Research Assistant Professor, U of Kentucky  
C. Perez, Department of Pediatric Dentistry, U of Kentucky  
M. Larkin, Department of Pediatric Dentistry, U of Kentucky  
D. L. S. Scheffel, Department of Pediatric Dentistry, U of Kentucky

**Abstract:** Purpose: Resin infiltration proved an effective microinvasive approach for managing white spot lesions and enamel hypomineralization. This study aimed to evaluate the water sorption and solubility of eight experimental resin infiltrants containing ceramic particles and antimicrobial agents. Methods: Specimens were obtained by dispensing 50  $\mu$ L of each resin into standardized molds (5 mm  $\times$  2 mm) (n=6). The specimens were polymerized using a light-curing unit for 60 seconds. Following polymerization, the specimens were subjected to a desiccation cycle in a drying oven at 37°C for 22 hours and 23°C for 2 hours each 24-hour cycle until a constant mass (M1) was achieved. After obtaining M1, the specimens were measured, and the volume of each of them was calculated. The specimens were then immersed in distilled water at 37°C for 7 days. After immersion, the specimens were removed, blotted dry, and weighed to record their intermediate mass (M2). The specimens were returned to the drying cycle oven until a second constant mass (M3) was attained. Water sorption (WS) ( $\mu$ g/mm<sup>3</sup>) and solubility ( $\mu$ g/mm<sup>3</sup>) were determined based on the masses and volume of each specimen. Data were analyzed using Kruskal-Wallis and Dunn's tests ( $\alpha=0.05$ ). Results: WS was similar among the groups ( $p>0.05$ ). The combination of ceramic particles and the antimicrobial agent significantly increased the solubility of the experimental resins compared to the control (ICON). Conclusions: The addition of ceramic particles and the antimicrobial agent did not affect the WS and solubility of the experimental resins. However, the combination of both agents increases solubility.

Supported by: Impact grant DIRECT (Dental Integrated Research Education and Clinical Training) faculty and Student Pilot Research Award

Primary Presenter / email: **Conlin, Murphy** / mmco300@uky.edu  
**Medical Resident/Fellow**  
**Basic Research**

**Presentation 369**

Abstract Title: **Understanding and Implementation of Vital Pulp Therapy: A Nationwide Survey**

Author(s): T.M. Parrish, Division of Pediatric Dentistry, U of Kentucky; C. Perez, Division of Pediatric Dentistry, U of Kentucky; M. Larkin, Division of Pediatric Dentistry, U of Kentucky; D.L.S. Scheffel, Division of Pediatric Dentistry, U of Kentucky

**Abstract:** Purpose: This study aimed to assess the understanding and practices of VPT among pediatric dentists (PD), endodontists (ED), and general dentists (GD). Methods: A 26-question survey was distributed to members of the American Academy of Pediatric Dentistry (AAPD) using Qualtrics. The survey covered practitioner demographics, VPT knowledge, clinical practices, perceived effectiveness, confidence, materials, and resources. Absolute frequency of data was described. Results: 192 PD, 19 GD, 1 ED, and 2 dentists with other specialties across 44 states responded. Most respondents work in private practices and have been practicing for over 16 years, with 26.3% not attending continuing education (CE) courses. Around 90% were familiar with AAPD or AAE guidelines on VPT. Social media and online forums were cited by 15% as VPT information sources. Two-thirds preferred VPT for immature teeth, and 52.1% were somewhat confident in its long-term success. Concerns about treatment longevity influenced 48.5% not to perform VPT on immature teeth. While 88.7% were confident in diagnosing, 91.5% felt confident in treating VPT cases. Challenges with obtaining necessary equipment/materials were reported by 15%. MTA and GIC/RMGIC were preferred for indirect pulp capping, and MTA for direct pulp capping and pulpotomies. Over 30% considered provoked pain a contraindication for VPT on immature teeth. Conclusion: Overall respondents are confident in diagnosing and performing VPT. However, some concerns regarding treatment longevity exist. MTA is the preferred material for both indirect and direct pulp capping and pulpotomies.

Supported by: Pediatric Dentistry Residency Program

Primary Presenter / email: **Parrish, Tyler / tmpa258@uky.edu**  
**Medical Resident/Fellow**  
**Survey**

**Presentation 370**

Abstract Title: **Effect of Isolation Techniques on Behavior: Rubber Dam vs Isolite**

Author(s): K. Gupton, Division of Pediatric Dentistry, U of Kentucky; G. Hawk, Dr. Bing Zhang Department of Statistics, U of Kentucky; M. Larkin, Division of Pediatric Dentistry, U of Kentucky; C. Perez, Division of Pediatric Dentistry, U of Kentucky; D. Scheffel, Division of Pediatric Dentistry, U of Kentucky

**Abstract:** Purpose: This study compared the effect of the Isolite System (Iso) and Rubber Dam (RD) on the behavior of pediatric dental patients during restorative treatment. Methods: A convenience sample of 10 pediatric patients aged 6 to 12 years from the UK Pediatric Dental Clinic requiring restorations in two or more quadrants was enrolled. Participants were randomized to receive treatment using one isolation system (Iso or RD) at their first appointment and the other at a subsequent appointment. Similar restorative procedures were performed during both visits. Patient behavior was assessed at four time points: "sitting in the chair," "anesthesia," "isolation placement," and "restorative treatment," using the Modified Venham Scale. Data were analyzed using Fisher's exact test ( $\alpha=.05$ ). Results: No significant differences in patient behavior were observed between Iso and RD at any of the evaluated time points ( $P>.05$ ). The "anesthesia" stage exhibited the highest percentage of scores greater than 0, indicating increased anxiety or discomfort (77% for Iso and 62% for RD). In contrast, the "sitting in the chair" stage had the lowest percentage of scores greater than 0 (7.7% for Iso and 0% for RD). Conclusion: These findings suggest that both isolation systems can be effectively used into pediatric dental practice with similar outcomes regarding behavior.

Supported by: Pediatric Dentistry Residency Program

Primary Presenter / email: **Gupton, Kali** / kali.gupton@uky.edu  
**Medical Resident/Fellow**  
**Clinical Research**

Presentation **371**

Abstract Title: **Predicting Sizes of Stainless-Steel Crowns**

Author(s): Chhadh S, Perez C, Larkin M, Scheffel DLS; University of Kentucky, Lexington, KY

**Abstract:** Purpose: This study assessed whether the sizes of stainless-steel crowns (SSCs) placed on second primary molars can predict the crown size for first primary molars. Additionally, it evaluated whether the presence of an adjacent SSC would affect crown size.

Methods: SSC sizes cemented on 972 teeth were collected from charts of 181 individuals aged 3 to 8 years who received treatment under general anesthesia from January 1 to December 31, 2024. Data were analyzed using Spearman correlation and simple linear regression.

Results: Of the crowns, 254 (26%) were placed without an adjacent crown (single), while 718 (74%) were placed in pairs (grouped). The most frequent sizes observed for first molars were D4-D6, with D4 being the most common (15.3%) for grouped crowns and D5 (15.7%) for single crowns. E3 and E4 were the most frequent sizes for second molars, regardless of crown grouping. A moderate and statistically significant positive correlation was found ( $r = 0.5537$ ,  $p < 0.0001$ ) between the crown sizes of second and first molars. Simple linear regression indicated that for every 1-unit increase in the size of the second molar crown, the size of the first molar crown increases by 0.4950 units on average. About 30% of the variability in the size of the first molar crown can be explained by the size of the second molar crown ( $R^2 = 0.2918$ ).

Conclusion: Although the second molar crown size moderately predicts the first molar crown size, the low predictive power suggests other factors may influence crown selection.

Supported by:

Primary Presenter / email: **Chhadh, Sarah** / sarahchhadh@gmail.com  
**Medical Resident/Fellow**  
**Clinical Research**

**Presentation 372**

Abstract Title: **Comparison Between Two Types of Collagen Matrices to Treat Single Gingival Recession: a Data Reanalysis**

Author(s): B.Faltas, Division of Periodontics, U of Kentucky College of Dentistry; M.P. Santamaria, Division of Oral Health Research, U of Kentucky College of Dentistry; L. M. Shaddox, Division of Oral Health Research, U of Kentucky College of Dentistry; Dolph Dawson, Division of Periodontics, U of Kentucky College of Dentistry; Mohanad Al-Sabbagh, Division of Periodontics, U of Kentucky College of Dentistry; M. M. V. Miguel, Division of Oral Health; L. F. Ferraz, Sao Paulo U; A. Rossato, Sao Paulo U

**Abstract:** Background: Gingival recession (GR) is a prevalent problem that affects up to 100% of those 50 years old and older. At present, systematic reviews show that the coronally advanced flap (CAF) associated with a connective tissue graft (CTG) is the gold standard technique. However, this technique can cause pain and morbidity. Moreover, in cases of generalized recession, the amount of autogenous tissue that can be collected may not be enough to treat all cases. Due to the disadvantages of CTG, there are biomaterials available on the market that have been used as a substitute for an autogenous graft. These materials have been manufactured differently, using different processes and materials, and with different origins (human and non-human sources). Therefore, these materials have distinct characteristics which may influence the clinical outcome. There is a gap in the literature of studies comparing (head-to-head) different biomaterials on the market. Thus, this study reanalyzed data from two previous studies performed by our research group that evaluated the treatment of Cairo's RT1 GR using CAF with either a porcine-derived cross-linked volume-stable collagen matrix (CAF+VCMX) or a porcine-derived non-cross-linked collagen matrix (CAF+CM). Data from two clinical trials were extracted to make this comparison.  
Materials and methods: Thirty-nine patients from two previous randomized clinical trials treated by either CAF with VCXM or CAF with CM were assessed over 6 months. Clinical, esthetic, and patient-centered parameters were obtained. Two-way repeated measures ANOVA, Mann-Whitney rank sum, Chi-square, and t-paired tests were used.

Supported by:

Primary Presenter / email: **Faltas, Bridget** / [bfaltas@uky.edu](mailto:bfaltas@uky.edu)  
**Medical Resident/Fellow**  
**Clinical Trial**

**Presentation 373**

**Abstract Title: Comparison between Two Types of Restorative Protocols associated with CTG in Treating a Single Combined Defect.**

**Author(s):** M. Yacoub, Department of Periodontology, U of Kentucky; I. F. Santamaria, Department of Restorative, U of Kentucky; M.M. Miguel, Center for Oral Health Research, U of Kentucky; D. Dawson, Department of Periodontology, U of Kentucky; M. Al-Sabbagh, Department of Periodontology, U of Kentucky; L. Shaddox, Department of Research & Periodontology, U of Kentucky; M. Santamaria, Center for Oral Health Research, U of Kentucky.

**Abstract:** Objectives: Gingival recession (GR) associated with non-carious cervical lesions (NCCLs) results in combined defects (CDs), which pose challenges for root coverage treatment. Two surgical-restorative protocols, the full restorative (FR) and partial restorative (PR) approaches, have been proposed. However, a direct comparison between these techniques is lacking. This study aims to reanalyze data from randomized clinical trials (RCTs) to compare the clinical and patient-centered outcomes of FR versus PR combined with a coronally advanced flap (CAF) and connective tissue graft (CTG) in treating CDs.

**Methods:** This retrospective analysis includes data from two RCTs conducted at UNESP, Brazil, with 38 patients (FR: n=18; PR: n=20) diagnosed with single RT1 GRs and B+ NCCLs. Standardized restorative and surgical protocols were applied. Clinical parameters, including relative gingival recession (RGR), probing depth (PD), relative clinical attachment level (RCAL), gingival thickness (GT), and keratinized tissue width (KTW), were assessed at baseline, 6, and 12 months postoperatively. Patient-related outcomes, including aesthetics and dentin hypersensitivity, were evaluated using a visual analog scale (VAS). A professional aesthetic assessment was performed using a modified root coverage aesthetic score (MRES).

**Statistical Analysis:** Descriptive statistics will be presented as mean  $\pm$  standard deviation. The Shapiro-Wilk test will assess normality. Variance tests will be used for inter and intragroup comparisons. The chi-square test will compare categorical variables. A significance level of  $p < 0.05$  will be applied.

**Conclusion:** This study aims to provide evidence for optimal restorative protocols in CDs by evaluating clinical and patient-centered outcomes in a comparative analysis.

Supported by:

Primary Presenter / email: **Yacoub, Monica / Mya259@uky.edu**  
**Periodontics Resident**  
**Clinical Research**



Presentation **374**

Abstract Title: **Insulin-Loaded Silk Fibroin/Chitosan Film for Oral Mucosa Healing - A New Drug Delivery System.**

Author(s): M.M.V. Miguel, COHR, U of Kentucky; I.F. Mathias-Santamaria, College of Dentistry, U of Kentucky; A.C.F. Bonafe, Sao Paulo State University (UNESP), BR; C.N. Lemos, University of Sao Paulo (USP), BR; R.F.V. Lopez, University of Sao Paulo (USP), BR; M.F. Monteiro, State University of Campinas (UNICAMP), BR; R.C.V. Casarin, State University of Campinas (UNICAMP), BR; L.M. Shaddox, COHR, U of Kentucky; M.P. Santamaria, COHR, U of Kentucky.

**Abstract:** Several periodontal and peri-implant soft tissue defects require surgical treatment to reestablish function and aesthetics. Local and systemic factors can jeopardize tissue repair, leading to unexpected outcomes and postoperative discomfort. To overcome this issue, new devices have been developed, improving surgical procedure outcomes and patient experience. The present study aimed to assess a new silk fibroin (SF)/chitosan (CH) film loaded with insulin as a drug delivery system to improve palatal donor area healing after free gingival graft harvesting for ridge preservation. Sixty-nine patients with indication of tooth extraction were enrolled into three groups: Control Group (C;n=23): open wound on palatal mucosa followed by spontaneous healing; SF/CH film (F;n=23): open wound on palatal mucosa and SF/CH film as dressing; Insulin-loaded SF/CH film (IF;n=23): open wound on palatal mucosa and insulin-loaded SF/CH film as a delivery system. Clinical parameters, immunological biomarkers, and microbiome composition were assessed from baseline until 90 days postoperatively. Greater palatal wound closure was observed in F/IF groups at 7 ( $p<0.001$ ) and 14 days ( $p<0.012$ ) postoperatively compared to the C group, along with higher epithelialization rates. Both films reduced pro-inflammatory cytokines levels (IL-6, TNF- $\alpha$ ) and positively modulated biomarkers correlated to tissue degradation/remodeling. Some genera/species with a pathogenic role in the oral cavity were observed in spontaneous healing microbiome with lower healthy-related species levels compared to F and IF. A tendency of eubiosis was observed in F and IF throughout healing. Within the study's limitations, this device has a promising role in the oral cavity and positively influences mucosa healing.

Supported by: The São Paulo Research Foundation (FAPESP) #21/05963-8

Primary Presenter / email: **Viana Miguel, Manuela Maria** / mvi263@uky.edu  
**Postdoctoral Scholar/Fellow**  
**Clinical Trial**

Presentation **375**

Abstract Title: **Automated 3D Facial Index Using Machine Learning**

Author(s): K.J. Hunt, Department of Orthodontics, U of Kentucky; L. Sharab, Department of Orthodontics, U of Kentucky; C. Beeman, Department of Orthodontics, U of Kentucky; J. Hartsfield Jr., Department of Orthodontics, U of Kentucky; H. Reyes-Centeno, Department of Anthropology, U of Kentucky; M. Adel, Department of Orthodontics, U of Kentucky

**Abstract:** Background: Facial index is crucial for orthodontic diagnosis, categorizing faces (euryprosopic-E, mesoprosopic-M, leptoprosopic-L) by length-to-width ratios. Visual assessments risk inaccuracies, while objective methods enhance accuracy. Facial type relates to craniofacial structure, bite problems, self-esteem, and TMJ disorders. This study compares a machine learning-based facial index method with traditional techniques. Purpose: This study analyzed the reliability of manual landmarking on 3D images, compared manual and AI-based facial index calculations, and examined differences between visual and manual assessments. Findings will benefit clinical, research, and forensic applications.

Research Design: This retrospective study evaluated 130 orthodontic patients (Vectra® M3 images) by two calibrated residents and an AI model trained on BU-3DFE, UPM-3DFE, identifying facial landmarks used to calculate facial index using the formula  $FI = (N-Me/Zy-Zy) \times 100$ . Nine residents visually classified all images. Statistical analyses included ICC, Cohen's kappa, Fleiss' kappa, and Friedman's ANOVA.

Results: Manual classification preferred E, then M and L. AI likely overclassified E due to landmark misplacement. Visual methods varied, with M most common. The intraclass correlation coefficient (ICC) for Zy-Zy (AI vs. manual) was excellent (0.902), while N-Me was moderate (0.510). Nasion, Menton (X-plane), and Zygon (Y-plane) showed poor reliability (ICC < 0.5). Fleiss Kappa for L ranged from 0.555 (manual, AI, visual) to 0.693 (visual only).

Conclusions: Classification methods exhibit considerable differences. Manual classification offers a systematic foundation. AI ensures consistency, yet it might confuse landmarks, causing overclassification. Visual techniques are diverse. While AI standardizes measurements, validation remains essential.

Supported by: 2023 Resident Grant- Scientific Affairs Committee for the Southern Association of Orthodontists

Primary Presenter / email: **Hunt, Katie Jo / kjhu238@uky.edu**  
**Professional Student (MD, PharmD, Dentistry, PT)**  
**Translational Research/Science**

**Presentation 376**

Abstract Title: **Comparison of the periodontal status among patients treated with clear aligners versus conventional orthodontics**

Author(s): Sadie Cohen DMD, Department of Orthodontics, University of Kentucky; Sarah Haerle DMD, Department of Orthodontics, University of Kentucky; Mohamed Bazina DDS, MSD, Department of Orthodontics, University of Kentucky; Marcelo Mattos DDS, MSc, PhD, DMD, Department of Periodontics, University of Kentucky

**Abstract:** Objectives: To present preliminary data from a prospective clinical study on the effect of fixed orthodontic and clear aligner treatments on periodontal health and the oral microbiome.

Methods: Seven patients undergoing fixed orthodontic treatment and eleven undergoing clear aligner therapy were recruited from the University of Kentucky College of Dentistry's Orthodontic Graduate clinic. Clinical parameters were recorded, saliva and subgingival plaque samples were collected at pretreatment (T1) and 6 month follow-up (T2). At T2, the biofilm from orthodontic appliances was collected. The samples collected will undergo DNA extraction, 16SrRNA sequencing, and bioinformatic analysis.

Results: At baseline, we did not see a difference between the fixed appliance and aligner groups for the following metrics: age, number of teeth, percentage of sites with bleeding on probing (BOP), recession, pocket depths (PD) greater than 3mm and average PD. So far, one patient in fixed appliances has returned for recall, with an increase in BOP, recession, number of (PD) greater than 3 mm and average PD at T2. Among the seven patients with aligners that have returned for T2, the average probing depth decreased in 86% of patients in clear aligners. 43% showed an increase in the number of sites with PD greater than 3mm, 29% showed a rise in BOP sites and 43% showed an increase in gingival recession.

Conclusions: At this point, we can see an improvement in some relevant periodontal metrics associated with tissue inflammation, mostly probing depths, among clear aligner patients.

Supported by: UK COHR grant; Align Technologies grant

Primary Presenter / email: **Cohen, Sadie** / sco346@uky.edu  
**Professional Student (MD, PharmD, Dentistry, PT)**  
**Clinical Research**

Presentation **377**

Abstract Title: **A Qualitative Analysis of Oral Hygiene and Patient/Provider Interactions**

Author(s): K. Moncrief, College of Dentistry, U of Kentucky; L. Sharab, College of Dentistry, U of Kentucky;  
R. Ingram, College of Public Health, U of Kentucky; C. Beeman, College of Dentistry, U of  
Kentucky; R. Singer, College of Dentistry, U of Kentucky

**Abstract:** Objectives: Poor oral hygiene (OH) is common among orthodontic patients. Despite knowing OH is important, a number of adolescents in fixed appliances lack commitment to good OH. The objective of the study was to perform qualitative analysis through focus group interviews to determine patient and provider factors that influence oral hygiene.

Methods: 16 participants consented to the study. Participants divided into three focus groups for interviews (providers, poor oral hygiene adolescent patients (POH) with fixed appliances, and good oral hygiene adolescent patients with fixed appliances (GOH)). Interview questions aimed to explore perception, motivations and barriers around oral hygiene routines. Transcripts from interviews were analyzed by three researchers using Excel and QSR NVIVO analysis software.

Results: Preliminary results indicate that knowledge of proper OH were comparable between patient groups. Patients in the GOH group established a habit of brushing and viewed brushing as self-care while patients in the POH group had not established a habit and viewed brushing as a tedious task. Providers viewed education as the key to oral hygiene routines, and did not have skills to influence motivation or habit building for non-compliant patients.

Conclusions: Providers noted education as the most important factor in OH, while from the patient interviews it can be concluded that the establishment of a habit may be the most important aspect to OH. Providers may need to change the way they approach non-compliant patients, focusing more on motivation and early habit building rather than education.

Supported by:

Primary Presenter / email: **Moncrief, Kathryn** / kmo306@uky.edu  
**Graduate Student**  
**Basic Research**

**Presentation 378**

Abstract Title: **A Review of Exercise as an Adjunctive Pain Management Strategy in Orthodontics: Optimizing Patient Comfort and Treatment**

Author(s): Authors: Claudia Jennings (D3), Clare Smawley (Pre-Dental Student), Aquib Shafi BDS (2nd year Orthodontics Resident); Mentor: Lina Sharab DDS MS MSc

**Abstract:** Pain perception in orthodontic treatment remains a significant clinical challenge, contributing to patient discomfort, treatment efficiency, and reduced compliance. Effective pain management is essential for optimizing both patient experience and clinical outcomes. Emerging evidence suggests that physical exercise may serve as a viable adjunctive strategy for modulating pain perception in orthodontic patients, warranting further investigation into its underlying mechanisms and clinical applicability.

Pain can be modulated through various methods, including pharmacological approaches, physical activity, and psychological interventions. This review of twenty randomized control trials with over 1,800 participants analyzed across the studies, evaluates the existing literature on the effects of physical exercise on pain perception, with a focus on its relevance to orthodontic care. Pain assessment tools such as the algometer, Visual Analog Scale (VAS), and Oswestry Disability Index (ODI) were utilized across studies to measure pain thresholds, tolerance, and functional impairment. The studies reviewed included interventions ranging from low-intensity exercises (e.g., walking, Pilates) to high-intensity activities (e.g., ultramarathon running, professional ballet). Despite differences in exercise intensity, population size, and study design, all studies demonstrated a reduction in pain perception following exercise.

These findings suggest that physical exercise may serve as an effective adjunct to orthodontic treatment, improving patient comfort, enhancing compliance, and potentially optimizing treatment outcomes. Further research is needed to identify the most effective exercise regimens and assess the long-term benefits of physical activity for pain management in orthodontics.

Supported by:

Primary Presenter / email: **Jennings, Claudia / Caje225@uky.edu**  
**Professional Student (MD, PharmD, Dentistry, PT)**  
**Basic Research**

Presentation **379**

Abstract Title: **Clinical Recommendations for Using Zirconia as a Dental Implant Material**

Author(s): L. M. Jones, College of Dentistry, U of Kentucky; A. M. Kutkut, Division of Prosthodontics, U of Kentucky

**Abstract:** Purpose: Provide clinical guidance for dental professionals on using zirconia implants as an alternative to titanium implants, focusing on biological, mechanical, and aesthetic considerations based on recent clinical studies and systematic reviews.

Methods: A comprehensive review of peer-reviewed dental literature was conducted using PubMed and ScholarGPT to identify clinical studies and systematic reviews published in the last five years. Only studies featuring 36 months or greater follow-ups with adequate sample sizes and data were included. Studies lacking long-term follow-up or insufficient clinical relevance were excluded to ensure practical recommendations.

Results: Findings indicate that zirconia implants offer excellent biocompatibility, superior aesthetics, and comparable survival rates to titanium implants. However, multiple studies found that zirconia implants exhibit slightly more significant marginal bone loss than titanium implants.

Conclusions: Zirconia implants represent a viable option for patients with metal allergies, high aesthetic demands, or specific biocompatibility requirements. Their use is particularly recommended in anterior regions and single-tooth restorations where aesthetics are a priority. When considering zirconia implants, general dentists should carefully assess each patient's clinical needs, balancing esthetics, mechanical strength, and long-term stability. More long-term studies (>60 months of follow-up) are needed to accurately assess zirconia's success as an implant material. Additionally, more review articles directly comparing specific types of zirconia and titanium implants are required.

Keywords: Zirconia implants, Dental Implants, Clinical guidelines, Aesthetic dentistry

Supported by:

Primary Presenter / email: **Jones, Lillian** / [lmde235@uky.edu](mailto:lmde235@uky.edu)  
**Professional Student (MD, PharmD, Dentistry, PT)**  
**Clinical Research**

**Presentation 380**

**Using CBCT to Determine Appropriate Depth of Implant for Ideal Emergence Profile**

Abstract Title:

Author(s): A. Kutkut, Professor and Chief, Division of Prosthodontics, Director of Predoctoral Implant Program, University of Kentucky College of Dentistry, Endowed University Professorship in Dentistry; M. S. Sami, 3rd year Dental Student, University of Kentucky College of Dentistry

**Abstract:** The emergence profile is essential in dental implants to achieve optimal esthetics, functionality, and peri-implant tissue health. This study uses CBCT scans to analyze the anatomical and restorative space relationship to determine the ideal implant depth and angulation for natural emergence profile across various tooth and implant types. We hypothesize that using CBCT imaging will enhance implant design and placement precision, leading to an improved emergence profile. Therefore, we aim to generate evidence-based guidelines for implant placement protocols to improve clinical outcomes regarding esthetics, functions, and quality of care. In this study, CBCT imaging was utilized to assess the factors influencing the implant emergence profiles, specifically bone density, soft tissue thickness, and proximity to adjacent anatomical structures. The CBCT scans were uploaded into CoDiagnostix software, which was used to plan the placement in various tooth locations. The study focused on the maxillary arch for high esthetic demand and was divided into three sections. Teeth 1-5 were tissue-level implants, while teeth 6-15 were bone-level implants. Measurements of implant depth were recorded from the implant platform to the bone crest at the mesial, distal, buccal, and lingual sides. Preliminary results, supported by prior studies (Kutkut et al., 2013), suggest CBCT imaging enables precise depth and angulation measurements. Tissue-level implants are expected to improve peri-implant tissue adaptation, while bone-level implants may offer superior osseointegration and structural stability. By refining CBCT-guided placement techniques, this study provides new insights into optimizing clinical outcomes. This study demonstrates how CBCT-guided planning to establish ideal emergence profiles by assessing anatomical parameters. Combining CBCT with implant design will enable us develop evidence-based guidelines that improve decision-making and optimize implant placement.

Supported by:

Primary Presenter / email: **Sami, Mina / mssa228@uky.edu**  
**Professional Student (MD, PharmD, Dentistry, PT)**  
**Case Study**

Presentation **381**

Abstract Title: **Bone-to-Implant Contact Difference between Bone-Level Implants and Tissue-Level Implants, a case series report**

Author(s): S. Gordon, College of Dentistry, U of Kentucky, M. Rafla, College of Dentistry, U of Kentucky, A. Kutkut, Division of Prosthodontics, College of Dentistry, U of Kentucky

**Abstract:** Implant stability can be understood as a combination of mechanical and biological factors. Mechanical stability, often referred to as primary stability, is the initial resistance against micromotion and micro-mobility of a dental implant immediately after placement in the bone. This stability comes from the surrounding compressed bone tightly holding the implant in place. Within six weeks of healing, this mechanical stability decreases and is gradually replaced by biological or secondary stability. It occurs as new bone forms around the implant, effectively integrating it into the bone. Biological stability is indicated clinically by the process of osseointegration.

Successful dental implant treatment begins with achieving initial stability characterized by an insertion torque >30 Ncm and an Implant Stability Quotient (ISQ) value higher than a specified reference (60 RFA) measured immediately after the surgical placement of the implant. The ISQ value, obtained through resonance frequency analysis, ranges from 0 to 100, with higher values signifying better stability. This value is likely predictive of future clinical outcomes for dental implants. To achieve optimal treatment outcomes, it is crucial to consider clinical parameters and treatment protocols, as these significantly influence primary and secondary implant stability levels.

This case series report explores the differences in bone-to-implant contact between bone-level and tissue-level implants. We will compare the Osstell readings taken at implant delivery and follow-up appointments to identify differences. This study aims to gather information that will serve as adjunctive data for a future investigation, focusing on predicting the success of implants after placement based on various factors.

Supported by:

Primary Presenter / email: **Gordon, Sydney** / [sydney.gordon@uky.edu](mailto:sydney.gordon@uky.edu)  
**Professional Student (MD, PharmD, Dentistry, PT)**  
**Clinical Research**



**Presentation 382**

Abstract Title: **New Consideration for Using Limited-View Cone-Beam Computerized Tomography for Accurate Planning Guide Implant Surgery**

Author(s): Ahmad M. Kutkut, DDS, MS, PhD, Chief of the Prosthodontics Division, U of Kentucky College of Dentistry; Galal Omami, BDS, MSc, MDentSc, FRCD (C), Director of Oral Radiology, U of Kentucky College of Dentistry; Samuel S. Callister, DMD Candidate, U of Kentucky College of Dentistry

**Abstract:** This report describes a new consideration for using limited-view cone-beam computerized tomography for accurate planning of guided implant surgery. Prosthetically driven digital dentistry workflow is increasingly considered in general dental practices. Almost all graduate dentists have experience in digital implant dentistry education that involves using Cone Beam Computed Tomography (CBCT) for diagnosis and treatment planning, intraoral scanner (IOS) for digital impression, and treatment planning software to plan for single implant-supported restorations and implant-retained mandibular overdenture cases. The technique includes an accurate virtual surgical guide design based on IOS and limited-view CBCT. The 3D printing technology is used to fabricate a fully guided surgical template for implant placement procedures for the patient. The treatment outcomes in these two case reports are very favorable and to the authors' best knowledge; this is the first clinical report using the limited-view CBCT to plan guided implant surgery accurately.

Supported by:

Primary Presenter / email: **Callister, Samuel / ssca229@uky.edu**  
**Professional Student (MD, PharmD, Dentistry, PT)**  
**Clinical Research**

**Presentation 383**

Abstract Title: **Virtual Orthodontic Treatment to Accurately Plan Dental Implant for Orthodontic Anchorage**

Author(s): Amr Anjary, Division of Orthodontics, UK; Judy Anjary, Division of Periodontology, UK; Ahmad, Kutkut, Division of Prosthodontics, UK; Lina Sharab, Division of Orthodontics, UK

**Abstract:** The most common method of anchorage is using the patient's natural dentition. An alternative option is osseointegrated dental implants, which can be used as an absolute anchoring method in orthodontic treatment. This case report aims to present the digital workflow for completing the orthodontic treatment virtually and use the final teeth position to plan the dental implant used for orthodontic anchorage before starting the treatment.

Technique:

1. Use OnyxCeph<sup>3</sup>™ to virtually orthodontic move of the teeth for ideal orthodontic treatment outcome.
  2. Use coDiagnostiX® to plan the dental implants for orthodontic anchorage based on the virtual final orthodontic treatment.
  3. Design the surgical guide on the current teeth' position before the actual orthodontic treatment.
  4. Fully guided implant placement surgery was performed for the dental implant used for orthodontic anchorage.
  5. Orthodontics treatment was accelerated with an absolute osseointegrated dental implant anchorage.
- Communication between the prosthodontist, general dentist, and orthodontist is imperative for treatment success.

Supported by:

Primary Presenter / email: **Anjary, Amr / aan324@uky.edu**  
**Postdoctoral Scholar/Fellow**  
**Case Report**

**Presentation 384**

Abstract Title: **The impact of substance use disorder on oral health — A comprehensive narrative review**

Author(s): Tippadampally, S., BDS, College of Dentistry, UK; Morgan, R., Medical Center Library, UK; Oyler, D., PharmD, College of Pharmacy, UK; Rojas-Ramirez, M.V., DDS, MS, MPH, College of Dentistry UK.

**Abstract:** Introduction: Substance use disorders (SUDs) are associated with various oral health conditions, including dental caries, periodontal diseases, bruxism, tooth attrition, xerostomia, and premature loss of dentition. The seriousness of oral health problems in individuals with SUD is important for early disease detection, developing targeted treatment strategies, and improving quality of life and oral function. However, there is limited comprehensive research describing the extent of these oral health issues in this population.

Aim: To review the literature to identify the most common oral disease outcomes associated with SUD in adults.

Methods: A search strategy was applied across PubMed, EMBASE, and MEDLINE using relevant keywords, MeSH terms and title/abstract review. Search terms included: illicit drugs, SUD, and specific drug names linked to terms such as dental caries, oral health, periodontal disease. Inclusion criteria include English language papers, studies involving adults 19 years and older, and Human studies.

Results: The initial search yielded 370 articles. After applying the English language filter, the number was reduced to 345. Further limiting the results to studies involving adult populations (19+ years) narrowed the selection to 222 articles. We are now conducting a title and abstract review, and the final results will be available for the poster presentation.

Conclusion: This scoping review provides an overview of current evidence on the oral health impact of SUDs. The findings will help identify the most common oral disease outcomes linked to SUDs.

Supported by:

Primary Presenter / email: **Tippadampally, Srikavya** / srikavya221@gmail.com  
**Oral medicine Extern**  
**Literature review**

**Presentation 385**

Abstract Title: **Implant site development using orthodontic tooth movement benefits and challenges.**

Author(s): A.H.Ghazy, Department of Adult Dentistry, U of Kentucky; N. M. Elwany, Department of Adult Dentistry, U of Kentucky; G.T. Kluemper, Department of Orthodontics, U of Kentucky

**Abstract:** Permanent teeth may be lost due to trauma, caries, periodontal disease, or congenital factors, leading to challenges in implant site development, particularly in the esthetic zone. The alveolar process is a tooth-dependent tissue induced from competent neural crest cells, developing in response to tooth eruption and movement. When teeth are lost, the alveolar ridge undergoes noticeable reduction in height and width, affecting the esthetic and functional outcomes of prosthetic restorations. The quality and quantity of alveolar bone and gingival tissues are crucial for the long-term success of dental implants. Primary stability is directly related to the available alveolar bone at the time of implant placement, with regenerative bone primarily offering coverage, not primary support. Pre-prosthetic augmentation, often through bone grafting, is needed before implant placement. However, orthodontic tooth movement provides a viable alternative. This method uses the patient's own teeth to guide the production of new bone and gingiva by moving a healthy tooth through an edentulous area, expanding the ridge dimensions to accommodate an implant. The extrusion of hopeless teeth can also help augment bone and soft tissue at the implant site. In conclusion, this orthodontic approach is promising and less traumatic than traditional bone grafting, offering long-term stability once the definitive restoration is placed. Implant site development using orthodontic tooth movement, however, still presents challenges. Successful implementation requires a multidisciplinary approach, with good collaboration between an orthodontist, periodontist, and dental implant surgeon to coordinate treatment phases effectively.

Supported by:

Primary Presenter / email: **Ghazy, Amr** / Amrhatem.ghazy@uky.edu  
**Medical Resident/Fellow**  
**Clinical Research**

**Presentation 386**

Abstract Title: **Effect of Tongue Posture on Masticatory Musculature Activity — A Review of Electromyography Studies**

Author(s): S. Guthrie, Department of Oral Health Sciences, Division of Orofacial Pain, U of Kentucky; I. Moreno-Hay, Department of Oral Health Sciences, Division of Orofacial Pain, U of Kentucky; I. Boggio, Department of Oral Health Sciences, Division of Orofacial Pain, U of Kentucky

**Abstract:** Aim of investigation: Our review aimed to answer the question "Does resting the tongue against the palate versus the floor of the mouth significantly influence baseline electrical activity in the muscles of mastication?"

Methods: PubMed database was screened for relevant articles using the following search terms: ("Tongue") AND (Electromyography) AND ("Masticatory Muscles"[Mesh] OR "masseter muscle\*" OR "Pterygoid Muscles\*" OR "Temporal\* Muscle\*" OR "muscles of mastication"). Articles were included if they compared masticatory muscle activity using electromyography (EMG) with the tongue in at least two positions, and were available in English. Articles were excluded if they only used EMG during dynamic activities such as swallowing.

Results: Our query returned 201 results. After initial screening, 183 were excluded based on the aforementioned criteria. 18 were assessed for eligibility and 5 were included in the final reporting. Two of those found lower EMG activity in the masseters with the tongue on the floor of the mouth versus the palate, while three found no difference. Four studies found lower EMG activity in the temporalis with the tongue on the floor of the mouth, while one found no difference.

Conclusions: Masticatory musculature EMG readings are reduced when the tongue rests against the floor of the mouth vs. the palate. If reducing baseline muscle activity is a therapeutic goal, widespread self-care recommendations to place the tongue against the palate may be misguided; instead, evidence suggests the floor of the mouth may be a more restful position.

Supported by: Funding provided by UK IMPACT Grant.

Primary Presenter / email: **Guthrie, Scott** / [sagu228@uky.edu](mailto:sagu228@uky.edu)  
**Graduate Student**  
**Translational Research/Science**

**Presentation 387**

Abstract Title: **Auto Transplantation of a Mandibular 2nd Premolar in a Patient with Hypodontia: A Case Report**

Author(s): B. DuMont, Department of Orthodontics, U of Kentucky; S. Haerle, Department of Orthodontics, U of Kentucky; N. Ragland, Department of Orthodontics

**Abstract:** Dental auto transplantation can be defined as a surgical procedure that involves the extraction of a tooth and the transfer of that tooth to a receptor site in the same patient. Auto transplantation is a treatment alternative for replacing missing teeth, either those missing congenitally or those lost due to trauma or disease, by moving a tooth to a more suitable position within the same individual. In a recent systematic review, a 10-year survival rate of 96.3% was found following auto transplantation. A variety of factors have been suggested to influence the survival and success rates of auto transplanted teeth including: patient demographics (gender, age), donor tooth characteristics (type, morphology, position, root development), recipient site (location, local inflammation, alveolar bone volume and quality), and procedural conditions (stabilization method and duration, antibiotic use, damage of the periodontal ligament, need for an autograft or osteotomy, storage method and extraoral time of the graft during surgery, experience of the surgeon, and orthodontic interventions). In this case report, we present an 11-year-old Hispanic male congenitally missing both lower left premolars, who underwent auto transplantation of his lower right second premolar to the lower left quadrant as part of comprehensive orthodontic treatment. This case highlights the impact of collaborative care across dental disciplines.

Supported by:

Primary Presenter / email: **Ragland, Nicholas** / nera224@uky.edu  
**Graduate Student**  
**Clinical Research**

**20<sup>th</sup> Annual CCTS Spring Conference**  
Tuesday, April 1, 2025

Central Bank Center

ORAL PRESENTATION INDEX



**20<sup>th</sup> Annual CCTS Spring Conference**

**Pioneering Pathways: Innovative Trial Design  
in Translational Science**

**Tuesday, April 1, 2025  
Central Bank Center**

**Oral Presentations Abstract Book**

# 20<sup>th</sup> Annual CCTS Spring Conference

Tuesday, April 1, 2025

Central Bank Center

## ORAL PRESENTATION INDEX

| Session              | Last Name    | First Name | Title  |
|----------------------|--------------|------------|--|
| CCTS - Clinical      | Ahmed        | Saif       | Evaluating Cannabidiol as a Novel Therapeutic in the Treatment of Subarachnoid Hemorrhage                            |
| CCTS – Clinical      | Anderson     | Kayla      | Protocol for Assessing the Impact of a Plant-Based Diet for Diabetes Prevention: Pilot Study                         |
| CCTS – Clinical      | Bond         | Lynden     | Prevalence of Housing Insecurity Among Hospitalized Patients   |
| CCTS – Clinical      | Jackson      | Yolanda    | Culturally Targeting Infographic Messages to Increase Alzheimer's Prevention Among Black Adults                      |
| CCTS – Clinical      | McGladrey    | Margaret   | Catalyzing Community Action through Precision Public Health Analytics  |
| CCTS – Clinical      | Miracle      | Dustin     | Buprenorphine Utilization Following Removal of Prior Authorization Requirements in the Kentucky Medicaid Population  |
| CCTS – Clinical      | Verma        | Nirmal     | Pancreatic amylin as a novel biomarker for pancreatitis-related diabetes   |
| CCTS - Clinical      | Yinger       | Olivia     | Neonatal Intensive Care for Queer (NICQu) Families: An Update from the NICQu Families Research Team                  |
| CCTS - Translational | Alvord       | Victoria   | Estrogen receptor alpha regulates the liver circadian clock in female mice   |
| CCTS – Translational | Campbell     | Victoria   | The Impact of Highly Effective Modulator Therapies (HEMTs) on the ABCG5 ABCG8 Sterol Transporters                    |
| CCTS – Translational | Kaur         | Meredith   | Liposomal clodronate causes macrophage depletion following severe high-thoracic spinal cord injury                   |
| CCTS – Translational | Loria Kinsey | Sajeev     | Mapping Of Noradrenergic Neurons In Adult Offspring With Prenatal Fentanyl Exposure Using Light-Sheet Microscopy     |
| CCTS – Translational | Petty        | Analia     | Plasminogen Activator Inhibitor-1 Deficiency Augments Hypertension-induced Cardiac, but not Aortic Pathology in Mice |
| CCTS – Translational | Plaughter    | Alex       | Enhancing TIL efficacy in NSCLC through epigenetic reprogramming and computational modeling                          |
| CCTS – Translational | True         | Daniel     | Maternal opioid use with and without HCV infection disrupts the structure and immune landscape of placenta           |
| CCTS - Translational | Wardell      | Heather    | UKY-86 as a Novel Pharmacological Treatment for Methamphetamine Use Disorder (MUD)                                   |
| COM - Medicine       | Choate       | Radmila    | Frailty in Chronic Pancreatitis Linked to Worse Inpatient Outcomes   |
| COM – Medicine       | Garg         | Tanisha    | Hematological and Cytokine Alterations in a Rat Model of Sepsis Survivor following Spinal Cord Injury                |



# 20<sup>th</sup> Annual CCTS Spring Conference

Tuesday, April 1, 2025

Central Bank Center

## ORAL PRESENTATION INDEX

|                   |                |           |  |
|-------------------|----------------|-----------|--|
| COM – Medicine    | Graden         | Alexander | Variants of Unknown Clinical Significance (VUSs) in Pediatric Cancer Patients at the University of Kentucky              |
| COM – Medicine    | Kraus          | Kameron   | Distal Interlocking Screw Backout in New-Generation Retrograde Femoral Nails: A Retrospective Comparative Study          |
| COM – Medicine    | McAtee         | Annabel   | Timeline of B Cell Maturation in the Skull, Femur, and Dura After Ischemic Stroke in Mice                                |
| COM – Medicine    | Pandey         | Vivek     | Cardiac remodeling, recognition memory deficits and accelerated aging in rat females with prior gestational diabetes     |
| COM – Medicine    | Prabhat        | Abhilash  | Dim Light at Night Causes a Loss in the 24-hour Rhythm of Heart Rate in db/db Mice                                       |
| COM - Medicine    | Rozmus         | Ezekiel   | Conserved cis-regulatory elements are critical for circadian regulation of human ion channel gene promoters in the heart |
| Internal Medicine | Daneshgar      | Nastaran  | Cdkn2a Variants exacerbate DNA Damage-Associated Myocardial Fibrosis in Various Cardiomyopathies                         |
| Internal Medicine | Dharanipragada | Nikitha   | Deletion of Carnitine Palmitoyltransferase 1a from Adipocytes Leads to Insulin Resistance in Female Mice                 |
| Internal Medicine | Fine           | Rebecca   | Evaluation of Privacy-Focused Endoscopy Data Extraction Using a Lightweight Open-Source Local Language Model             |
| Internal Medicine | Javidan        | Aida      | Obesity-Associated Inflammatory Responses are Significantly Modified by Insulin Sensitivity and Sex                      |
| Internal Medicine | McMurtry       | Shyla     | From Acute Coronary Syndromes and Cardiomyopathy to Fatal Arrhythmias: Re-challenging 5-Fluoropyrimidine Cardiotoxicity  |
| Internal Medicine | Thompson       | Andrea    | Edaravone Protects the Hippocampus from Brain Damage Following Insulin-Induced Severe Hypoglycemia                       |
| Internal Medicine | Zhu            | Qingzhang | PAQR4 impacts liver metabolic remodeling by mediating ceramide levels and hepatokine signaling                           |
| DREAM/SPARK       | Angoma         | Botshelo  | The Impact of Adverse Childhood Experiences on COVID-19-Related Stress and Mental Health in Emerging Adults              |
| DREAM/SPARK       | Dickerson      | Mandy     | The Relationship Among Perceived Environmental Exposures, Socioeconomic Factors, And Chronic Disease Outcomes            |
| DREAM/SPARK       | Silva-Jones    | Jillian   | A Meta-analysis of Labor Determinants and Sleep Health across the Lifespan   |
| DREAM/SPARK       | Soria Chiroque | Eduardo   | A Collaborative Model for Diabetes Education: Connecting RDNs and Promotores de Salud                                    |

# 20<sup>th</sup> Annual CCTS Spring Conference

Tuesday, April 1, 2025

Central Bank Center

## ORAL PRESENTATION INDEX

|                  |                |             |  |
|------------------|----------------|-------------|--|
| DREAM/SPARK      | Washington     | Keyoncee    | The Impact of Adultification Bias on Self-Image and Academic Success Among Black WomenK. Washington                      |
| DREAM/SPARK      | Wu             | Xian        | Genetic Risk and Perceived Neighborhood Disorder with Dementia Across Diverse Populations: Results from All of Us        |
| Informatics - AM | Dhar           | Sanjay      | Muscle ultrasound is ideally suited for optimal evaluation of functional recovery after critical illness.                |
| Informatics - AM | Mohammadmoradi | Shayan      | VAMP8-Dependent Platelet Secretion Drives Aneurysm Progression: Insights from Clinical and Experimental Models           |
| Informatics - AM | Munia          | Nusrat      | Prompting Medical Vision-Language Models to Mitigate Diagnosis Bias by Generating Realistic Dermoscopic Images           |
| Informatics - AM | Schreiber      | Alison      | Probing the Neural Bases of Individual Differences in Reward Sensitivity: Applications of Machine Learning Methods       |
| Informatics - PM | Armstrong      | Samuel      | Advancing Research and Innovation Through AI   |
| Informatics – PM | Baker          | Mindy       | The Applicability of Google Lens in Dermatology: A Retrospective Diagnostic Accuracy Study in Over 150 Patients          |
| Informatics – PM | Bidros         | Patrick     | Quality Assessment of AI-Generated Response to Patient-Reported Information Gaps Regarding HPV Oropharyngeal Cancer      |
| Informatics – PM | Chattopadhyay  | Ishanu      | Predicting Adverse Effects for Antifibrotic Therapy in Pulmonary Fibrosis using Large Digital Twins.                     |
| Informatics – PM | Minton         | Austin      | Multi-Omic and Biochemical Profiling of Heart Failure Specimens at the University of Kentucky                            |
| Informatics – PM | Rifa           | Kazi Ramisa | Swin-KAT: Advancing Swin Transformer with Kolmogorov-Arnold Network for CT Image Quality Assessment                      |
| Informatics - PM | Xia            | Yuyan       | Physician Assistant Student Attitudes Toward the Utilization of AI to Enhance Psychiatry Skill Development               |
| CON - Nursing    | Frapolly       | Jordyn      | Mothers Perception of Hospital Adherence to the Ten Steps to Successful Breastfeeding Predicts EBF in Latinx Mothers     |
| CON - Nursing    | Hawes          | Natalie     | Family functioning is associated with dietary behaviors in Latino(a) adults at risk for T2D and CVD                      |
| CON - Nursing    | Sanders        | Jeanette    | Primary Nurse Framework: All-Registered Nurse Staff Model in Trauma Surgical and Abdominal Transplant Critical Care Unit |

# Oral Abstracts

Session **CCTS-Clinical**

Abstract Title: **Evaluating Cannabidiol as a Novel Therapeutic in the Treatment of Subarachnoid Hemorrhage**

Author(s): S. Ahmed, College of Medicine, U of Kentucky; L. Whitnel, Department of Neurosurgery, U of Kentucky; J. Roberts, Department of Neurosurgery, U of Kentucky

**Abstract:** Accounting for approximately 5% of all strokes, subarachnoid hemorrhage (SAH) is a severe condition characterized by bleeding in the space around the brain, commonly as the result of a ruptured aneurysm. The high fatality rate of the disease (42% within the first 28 days) can be attributed to cerebral ischemia resulting from the persistent constriction (vasospasm) of small blood vessels in the brain, which is likely mediated by neuroinflammatory mechanisms. In this project, we aimed to evaluate the effectiveness of cannabidiol (CBD), which is reported to have potent anti-inflammatory and neuroprotective properties, in improving the outcomes of mice with surgically induced SAH. Specifically, we looked at how the daily administration of CBD influences the presence of disease biomarkers and affects the overall mortality of mice post-SAH. Using western blot, we were able to quantify levels of GFAP, IBA-1, and HIF-1alpha in the brain tissue of mice, which are proteins indicative of reactive gliosis and hypoxia. Our data shows a possible downregulation of all three proteins in the tissue of injured mice treated with CBD compared to controls. This data was supported by histological staining of the tissue. Additionally, mice treated with CBD post-SAH had a significantly lower mortality than those treated with vehicle. The results of this project highlight the therapeutic potential of CBD in treating SAH and opens the door for further investigation into a much-needed treatment for this deadly disease.

Supported by: NIH R21 grant (1R21NS135089-01) (Roberts, PI) and PSMRF Program

Primary Presenter / email: **Ahmed, Saif** / sah239@uky.edu  
**Professional Student (MD, PharmD, Dentistry, PT)**  
**Translational Research/Science**  
**Trauma**

# Oral Abstracts

Session **CCTS-Clinical**

Abstract Title: **Protocol for Assessing the Impact of a Plant-Based Diet for Diabetes Prevention: Pilot Study**

Author(s): Kayla Anderson, Department of Pharmacology and Nutritional Sciences, U of Kentucky; Jean Fry, Department of Athletic Training and Clinical Nutrition, U of Kentucky; Philip Kern, Division of Endocrinology, College of Medicine, U of Kentucky

**Abstract:** Skeletal muscle plays a key role in postprandial glucose disposal and metabolism, and impairments in muscle insulin signaling contribute to the development metabolic diseases like type 2 diabetes. A plant-based diet rich in phytonutrients has been shown to enhance insulin sensitivity. However, the extent to which dietary interventions affect insulin sensitivity may differ between males and females due to body composition, hormone differences, and sex-specific metabolic pathways. Our study aims to define how sex influences insulin sensitivity and skeletal muscle signaling when adults with prediabetes transition from a Western diet to a healthy, plant-based diet.

This pilot study is a single arm clinical trial, with participants serving as their own controls. Eligible participants (aged 30-55, BMI  $\geq$  27, high waist circumference, and prediabetes) undergo screening, including fasting blood glucose, HbA1c, and anthropometric measures. Following a one-week run-in, participants consume exclusively plant-based meals and snacks for 28 days, with one optional "cheat" meal per week. Dietary compliance is monitored through daily meal questionnaires and food photographs. The primary outcome is insulin sensitivity as estimated with the OGTT-based Matsuda Index.

We hypothesize that a plant-based diet will significantly improve insulin sensitivity (IS) in adults with prediabetes, with men experiencing greater improvements than women. Previous research has shown men achieve greater reductions in insulin resistance with lifestyle interventions, suggesting sex-specific responses. Findings from this study will inform larger powered clinical trials and support the development of tailored dietary interventions to more effectively prevent the progression of prediabetes to type 2 diabetes.

Supported by:

Primary Presenter / email: **Anderson, Kayla** / [kayla.anderson@uky.edu](mailto:kayla.anderson@uky.edu)  
**Graduate Student**  
**Translational Research/Science**  
**Nutrition**

# Oral Abstracts

## Session **CCTS-Clinical**

Abstract Title: **Prevalence of Housing Insecurity Among Hospitalized Patients**

Author(s): L. Bond, College of Social Work, U of Kentucky; A. Latimer, College of Social Work, U of Kentucky; J. McFarlin, College of Medicine, U of Kentucky; R. B. Conley, College of Social Work, U of Kentucky; L. Ragsdale, College of Medicine, U of Kentucky

**Abstract:** Background: Each year, millions of people experience housing insecurity across the U.S., including cost burden, overcrowding, and homelessness. While there are measures of housing-related needs, including the American Housing Survey and the annual Point-in-Time Count, they exclude the needs of people residing in institutions, including hospitals. The objective of this study is to compare the prevalence of housing insecurity among a sample of hospitalized patients with available national data.

Methods: On January 29, 2025, we conducted a point-in-time count in collaboration with local hospitals to survey patients about their housing experiences and situations, health, and demographics.

Findings: A total of 306 patients provided data about their living situations prior to coming to the hospital.

Preliminary results show that patients were primarily white (83%), female (52%), and ranged in age from 18-95 (M= 53 ± 17). Overall, 46% of patients reported the following forms of housing insecurity: doubled-up housing (14.6%), unaffordable housing (36.7%), or homelessness (3.6%).

Conclusion: Rates of housing insecurity were higher among hospitalized patients than compared to the national estimates of housing insecurity and homelessness (35% and .2%, respectively). While preliminary findings suggest that hospital settings may be an appropriate place for housing-related interventions to prevent and address housing insecurity and indicate a need for future research on populations left out of traditional measures of housing insecurity, which are necessary to accurately estimate housing-related needs and the distribution of resources and funding available to communities.

Supported by: CCTS Small Grants Program and College of Social Work

Primary Presenter / email: **Bond, Lynden** / lynden.bond@uky.edu  
**Faculty**  
**Health Equity Research**  
**Policy**

# Oral Abstracts

Session **CCTS-Clinical**

Abstract Title: **Culturally Targeting Infographic Messages to Increase Alzheimer's Prevention Among Black Adults**

Author(s): Y. L. Jackson, College of Communication and Information, U of Kentucky, Center for Clinical and Translational Science, U of Kentucky; N. G. Harrington, College of Communication and Information, U of Kentucky

**Abstract:** Objectives: This study integrates scientific evidence to create messaging about the modifiable risk factors for Alzheimer's disease (AD) and examines how culturally targeting elements in message content, like text and visualizations in infographic messaging, impacts cognitive processing of AD prevention messages among Black adults.

Methods: This study is guided by the 2-dimensional theory of cultural sensitivity and the elaboration likelihood model (ELM). The 2-dimensional theory distinguishes between surface structure (visualizations) and deep structure (culturally embedded text) in messaging. The ELM examines how messages influence cognitive processing. A 2 x 3 factorial experiment will test the impact of cultural features (surface vs. deep) and message images (no images, non-targeted images, targeted surface images) on persuasive outcomes for modifying behaviors for AD risk factors. Black adults will be recruited from local churches and randomly assigned to one of six conditions, after which they will complete post-test measures. Statistical analyses will determine the effects of cultural targeting and message effects on outcome variables.

Results: We hypothesize that surface structure infographic messages and deep structure text-based messages will outperform other conditions, enhancing cognitive processing, attitudes and behavioral intentions toward AD risk reduction. Additionally, we will explore differences between surface structure infographic messages and deep structure text-based messages on outcome variables, advancing understanding of cultural sensitivity and visual vs. text-based messaging.

Discussion/Significance: This research will advance knowledge on culturally targeted health messages and the persuasive impact of text vs. visual, informing more effective, culturally relevant public health campaigns to reduce AD risk in diverse populations.

Supported by: NIH award: TL1 grant (TL1TR001997).

Primary Presenter / email: **Jackson, Yolanda** / Yolanda.Jackson@uky.edu  
**Graduate Student**  
**Health Equity Research**  
**Communication**

# Oral Abstracts

## Session **CCTS-Clinical**

Abstract Title: **Catalyzing Community Action through Precision Public Health Analytics**

Author(s): C. Salem, Department of Internal Medicine, King's Daughters; E. Clear, Department of Health Management and Policy, U of Kentucky; R. Hogg-Graham, Department of Health Management and Policy, U of Kentucky; M. B. Lacy, Department of Epidemiology & Environmental Health, U of Kentucky; K. McQuerry, Department of Biostatistics, U of Kentucky; S. Slavova, Department of Biostatistics, U of Kentucky; K. Heier, Department of Biostatistics, U of Kentucky; C. Phan, Department of Biostatistics, U of Kentucky; M. Hall, Department of Biostatistics, U of Kentucky;

**Abstract:** Kentucky's 120 counties vary widely in geography, rurality, health and social service access, education, and demographics. Using precision analytics approaches with population health data helps identify localized patterns of social determinants and comorbidities, supporting the design of tailored interventions. Established with support from a 2024 UK Provost IMPACT award, the Precision Public Health Alliance (PPHA) between the University of Kentucky (UK) College of Public Health (CPH) and UK King's Daughters (UKKD) involves applying precision analytics to UKKD electronic health records (EHR) and secondary county-level datasets to map quality indicators by social, demographic, and clinical comorbidity factors. UKKD has collected longitudinal health data with a stable, mostly rural population in northeastern Kentucky since integrating its EPIC EHR system in 2008. In addition to UKKD and UKCPH clinicians and researchers, PPHA includes a community-based Action Team of local social services, behavioral health, and public safety partner agencies and patients with relevant lived experience. In fall 2024, UKKD and UKCPH developed a statistical analysis plan to examine the interplay of social, geographic, and clinical factors associated with colorectal cancer screening rates in counties served by UKKD. In spring 2025, the UKKD and UKCPH teams will present findings from this analysis to the Action Team, co-design strategies to implement tailored community or health system interventions to improve colorectal cancer screening rates, and apply for funding. Additionally, the PPHA is creating a population health and research training plan for UKKD and UKHC's internal and family medicine residents.

Supported by: UK Provost IMPACT award

Primary Presenter / email: **McGladrey, Margaret** / [margaret.mcgladrey@uky.edu](mailto:margaret.mcgladrey@uky.edu)  
**Faculty**  
**Community Research**  
**Informatics**

# Oral Abstracts

Session **CCTS-Clinical**

Abstract Title: **Buprenorphine Utilization Following Removal of Prior Authorization Requirements in the Kentucky Medicaid Population**

Author(s): D. K. Miracle, Department of Biostatistics, U of Kentucky; L. R. Hammerslag, Institute for Biomedical Informatics, U of Kentucky; S. Slavova, Department of Biostatistics, U of Kentucky; M. R. Lofwall, Center for Drug and Alcohol Research, U of Kentucky; J. Talbert, Institute for Biomedical Informatics, U of Kentucky; S. L. Walsh, Center for Drug and Alcohol Research, U of Kentucky; P. R. Freeman, Department of Pharmacy Practice and Science, U of Kentucky

**Abstract:** Objective: This study aims to identify changes in buprenorphine dispensing for treatment of opioid use disorder (OUD) following the removal of transmucosal buprenorphine PA requirements for Kentucky Medicaid enrollees.

Methods: Kentucky administrative Medicaid claims records, from 1/1/2017 through 6/30/2023 were used to identify enrollees aged 18-64 with a dispensed prescription for any buprenorphine product approved by the US Food and Drug Administration (FDA) for treatment of OUD. Segmented regression analysis was used for statistical modeling of an interrupted time series design to describe changes in the quarterly proportion of individuals with OUD receiving buprenorphine. As the effective date of PA removal was February 1, 2019, the first two quarters (Q1-Q2) of 2019 were used as a phase-in period for the model interruption. The model also adjusted for the Kentucky COVID-19 State of Emergency (2020 Q3-2022 Q2).

Results: The quarterly proportion of enrollees with OUD who had received buprenorphine within the prior 12 months ranged from 0.29 to 0.44 across the study period. Prior to PA removal, the estimated proportion of enrollees with OUD receiving buprenorphine was increasing (pre-policy slope +0.009; 95% CI 0.008–0.011). Following PA removal, an immediate increase in buprenorphine dispensing was observed (level change +0.04; 95% CI 0.03–0.05) alongside a decrease in slope (slope change -0.006; 95% CI -0.008– -0.005) coinciding with Kentucky Medicaid's decision to begin covering methadone treatment for OUD in Q3 2019.

Conclusions: Following removal of transmucosal buprenorphine PA requirements for Kentucky Medicaid enrollees, an abrupt increase in buprenorphine dispensing was observed.

Supported by: This research was funded by the National Institutes of Health through the NIH HEAL (Helping to End Addiction Long-term<sup>SM</sup>) Initiative under award number UM1DA049406 and also supported by the National Institute On Drug Abuse of the National Institutes of Health under Award Number R01DA057605, Rapid Actionable Data for Opioid Response in Kentucky (RADOR-KY).

Primary Presenter / email: **Miracle, Dustin** / [dustin.miracle@uky.edu](mailto:dustin.miracle@uky.edu)  
**Postdoctoral Scholar/Fellow**  
**Policy Research**  
**Alcohol/Substance Abuse**



# Oral Abstracts

## Session **CCTS-Clinical**

Abstract Title: **Pancreatic amylin as a novel biomarker for pancreatitis-related diabetes**

Author(s): N. Verma, N.S. Leibold, E. Smith, R. Davargaon, D. Kotiya, K. Karnik, R. Hill, K. McQuerry, S. Fisher, D. Conwell, F. Despa; Departments of Internal Medicine and Pharmacology and Nutritional Sciences, U of Kentucky

**Abstract:** Background: Pancreatitis-related diabetes (Type-3c diabetes) is linked to pancreatic dysfunction. Islet amyloid polypeptide (amylin) forms pancreatic amylin amyloid contributing to  $\beta$ -cell apoptosis in persons with diabetes. We conducted a retrospective cross-sectional analysis of bio-banked plasma samples and clinical data to investigate the relationship between plasma levels of amyloid-forming amylin and pancreatitis.

Methods: Observer-masked analyses were conducted on plasma from n=145 participants in the Consortium for the Study of Pancreatitis, Diabetes and Pancreatic Cancer (CPDPC). Samples were stratified based on pancreatitis stage: Control, Recurrent Acute Pancreatitis (RAP), or Chronic Pancreatitis (CP) and diabetes status (diabetic or non-diabetic). To detect amyloid-forming amylin, we ultracentrifuged plasma samples and separated the bottom plasma layer commonly containing the high-density plasma component. High- and low-density fractionates along with uncentrifuged plasma were assayed for amylin content using ELISA.

Results: In the high-density plasma fraction, there were statistically significant main effects of pancreatitis stage ( $P=0.0059$ ) and diabetes status ( $P=0.0086$ ) for the concentration of circulating amyloid-forming amylin. In the Control group, the 95% CI for amylin in the high-density fraction is (0.14, 0.21) ng/mg total protein versus (0.21, 0.33) in the CP group. After the Tukey adjustment for the pairwise comparisons for persons with diabetes, those with CP had higher average plasma amylin levels than those in the Control group (95% CIs: 0.15, 0.41 ng/mg vs. 0.06, 0.15 ng/mg).

Conclusions: Amylin has distinct concentration patterns in plasma depending on pancreatitis stage, diabetes status and their interaction. Longitudinal amylin tests could detect high risk for progression to Type-3c diabetes.

Supported by: Pilot funding UK Center for Clinical and Translational Science through Grant UL1TR001998.

Primary Presenter / email: **Verma, Nirmal** / nirmal.verma@uky.edu  
**Staff**  
**Clinical Research**  
**Diabetes**

# Oral Abstracts

Session **CCTS-Clinical**

Abstract Title: **Neonatal Intensive Care for Queer (NICQu) Families: An Update from the NICQu Families Research Team**

Author(s): A. Jones, College of Social Work, U of Kentucky; O. S. Yinger, School of Music, U of Kentucky; R. H. Farr, Department of Psychology, U of Kentucky; K. Fallin-Bennett, Department of Family and Community Medicine, U of Kentucky; A. Kruse-Diehr, Department of Family and Community Medicine, U of Kentucky; C. Moore, Department of Psychology, U of Kentucky; N. Kulkarni, Department of Psychology, U of Kentucky; S. Beiring, College of Social Work, U of Kentucky; C. Gibbs, School of Music, U of Kentucky

**Abstract:** Having an infant in the Neonatal Intensive Care Unit (NICU) can disrupt parent well-being, the transition to parenthood, and the typical trajectories of infant and child health. For lesbian, gay, bisexual, transgender, queer, or other sexual and gender minority identity (LGBTQ+) parents, this stress may be compounded by health disparities and fear of stigma and discrimination; however, research is lacking about LGBTQ+ parents of infants in the NICU. Since 2023, the Neonatal Intensive Care for Queer (NICQu) Families research team has been addressing this gap in the research through a multiphase, interdisciplinary research project. In this presentation, the NICQu Families research team will give an update on our past, present, and future research. We will first share the results of an integrative review we conducted in which we identified a need for rigorous research of family-centered NICU care using community engaged methods to center perspectives of LGBTQ+ parents. We will then describe Phase 1 of our research project, in which we formed a Community Advisory Board (CAB) of four LGBTQ+ parents who had infants in the NICU and three healthcare providers who work with these parents. Next, we will share preliminary results from Phase 2, a qualitative study in which we interviewed ten LGBTQ+ parents of NICU infants and identified themes related to difficulties, sources of support, and recommendations. Finally, we will explain the development of Phase 3, in which we are developing a survey based on the results of Phase 2.

Supported by: This research was funded by the University of Kentucky Center for Health Equity Transformation (CHET) and Center for Clinical and Translational Science (CCTS) pilot grant, the UNITE RPA, and the College of Fine Arts. This publication was supported by the National Center for Research Resources and the Center for Advancing Translational Sciences, National Institutes of Health, through Grant UL1TR001998.

Primary Presenter / email: **Yinger, Olivia** / olivia.yinger@uky.edu  
**Faculty**  
**Health Equity Research**  
**Pediatrics**

# Oral Abstracts

## Session **CCTS-Translational**

Abstract Title: **Estrogen receptor alpha regulates the liver circadian clock in female mice**

Author(s): VM. Alvord, Department of Biology, U of Kentucky; OB. Omotola, Department of Biology, U of Kentucky; and JS. Pendergast, Department of Biology, U of Kentucky

**Abstract:** The mammalian circadian system is composed of a main clock in the suprachiasmatic nucleus (SCN) and multiple tissue clocks that regulate physiology and behavior in synchrony with environmental cycles. This organization of the circadian system partitions behavior and physiology to specific times of day to optimize health. Disrupting the liver circadian clock alters the timing of metabolic processes. We previously found that the timing, or phase, of the liver circadian clock is markedly altered when male mice are fed high-fat diet (HFD). In contrast, the liver circadian clock is not affected by HFD feeding in female mice that have circulating estrogens. The goal of this study was to investigate the estrogen signaling mechanism that regulates the liver circadian clock in female mice. We tested whether ER $\alpha$  was necessary to regulate circadian alignment using global ER $\alpha$  KO mice. We measured molecular circadian rhythms from multiple tissues using the PERIOD2::LUCIFERASE reporter. We found the liver, but not the SCN, rhythm, peaked earlier in ER $\alpha$ KO females compared to wild-types fed HFD, resulting in temporal misalignment of tissue clocks. To determine whether ER $\alpha$  signaling was sufficient to regulate the phase of the liver clock during HFD feeding, ovariectomized females were implanted with pellets containing the ER $\alpha$  agonist, propyl-pyrazole triol (PPT), or vehicle. HFD feeding advanced the phase of the liver clock in vehicle-treated females but had no effect in PPT-treated females. These data show that estrogens signal via ER $\alpha$  to prevent disruption of the timing of the liver circadian clock during HFD feeding.

Supported by: TL1TR001997 from UK Center for Clinical and Translational Science, National Institute of Health R01DK124774, and NSF CAREER IOS-2045267

Primary Presenter / email: **Alvord, Victoria** / tori.alvord@uky.edu  
**Graduate Student**  
**Translational Research/Science**  
**Circadian biology**

# Oral Abstracts

## Session **CCTS-Translational**

Abstract Title: **The Impact of Highly Effective Modulator Therapies (HEMTs) on the ABCG5 ABCG8 Sterol Transporters**

Author(s): Meredith Campbell, Isha Chauhan, Victoria Noffsinger, Brooke Brundage, Rachael R. Morgan, Robert N. Helsley and Gregory A. Graf, College of Medicine, University of Kentucky

**Abstract:** Background: Cystic Fibrosis (CF) is caused by a genetic mutation in the CFTR gene that encodes an ATP-Binding Cassette (ABC) Transporter. CF is treated with HEMTs (Ivacaftor + Tezacaftor + Elexacaftor) to rescue CFTR function. Sitosterolemia is characterized by excess xenosterol accumulation and is caused by mutations in either ABCG5 or ABCG8, an obligate heterodimer that secretes sterols into bile and opposes their absorption in the small intestine. Our goal is to determine if HEMTs can also rescue function of ABCG5 or ABCG8 mutants.

Methods: Lentiviral Transduction of Human HepG2 hepatocytes creating cells expressing ABCG5 and ABCG8. Cells were treated with HEMTs and levels of each protein determined by immunoblotting. In vivo, mice fed a Western-Type Diet and administered triple HEMTs using allometric dosing by oral gavage for 5 days. Basal bile, feces, plasma, and tissues were collected and analyzed for total G5G8 protein, plasma and biliary lipids were analyzed.

Results: HEMTs increased G5 protein levels and induced the formation of an unknown high molecular weight form but had no effect on G8 in vitro. Liver weights were increased in the HEMT treated mice compared to controls. Biliary cholesterol, bile acid, and phospholipid concentrations were significantly reduced.

Conclusion: HEMTs alter G5 abundance and apparent molecular weight, suggesting a post-translational modification(s), formation of a G5 homodimer, or novel protein-protein interaction. HEMTs interact with hepatic lipid transporters and disrupt biliary lipid secretion.

Supported by: NIH-NIDDK 1R01DK113625

Primary Presenter / email: **Campbell, Meredith** / mca450@uky.edu  
**Graduate Student**  
**Clinical Research**  
**Cardiovascular**

# Oral Abstracts

## Session **CCTS-Translational**

Abstract Title: **Liposomal clodronate causes macrophage depletion following severe high-thoracic spinal cord injury**

Author(s): Sajeev Kaur<sup>1</sup>, Reena Kumari<sup>1</sup>, Fernanda S. Franca<sup>1</sup>, JayLa A. Hudson<sup>1</sup>, Anna Baur<sup>3</sup>, Amir M Campbell<sup>1</sup>, Michael Hash<sup>1</sup>, Warren J. Alilain<sup>2</sup>, Samir P. Patel<sup>1</sup>, and John C. Gensel<sup>1</sup>; <sup>1</sup>Department of Physiology, Spinal Cord & Brain Injury Research Center, U of Kentucky; <sup>2</sup>Department of Neuroscience, Spinal Cord & Brain Injury Research Center, U of Kentucky; <sup>3</sup>College of Engineering, U of Kentucky

**Abstract:** Spinal cord injury (SCI) leads to an intraspinal inflammatory response including infiltrating blood leucocytes. Some of these subsets of immune cells (monocytes) contribute to ongoing tissue degeneration after SCI. Currently, there are no FDA-approved therapies for SCI. One promising therapy, clodronate liposomes (Formumax), depletes monocyte-derived intraspinal macrophages and several independent laboratories have reported therapeutic effects after lower thoracic SCI. The extent to which clodronate liposomes (CL) are effective after severe SCI or higher thoracic (T3) SCI has not been studied. Here, we determined the effectiveness of CL after T3 SCI after two different injury severities. Adult female Wistar rats were subjected to T3 spinal contusion with two different forces 300 kdyn (5s dwell time) and 400 kdyn (5s dwell time). For each severity, injured rats were randomly divided into two groups, one group received 2 ml Clodronate (7mg/ml) on days 1, 3, and 6 post-injury (once a day) through tail vein injections, and the control group received vehicle (2ml saline). Spinal cords were isolated 7dpi and histological assessment was performed CD-68, IBA-1 and CD-11b. The analysis revealed significant decreases in activated macrophage (CD-68) and macrophage/ microglia (IBA-1) accumulation after T3 injury. Ongoing statistical analysis will determine if macrophage accumulation and the magnitude of CL-mediated depletion are injury severity-specific. Identifying the effectiveness of CL across multiple severities is clinically significant.

Supported by:

Primary Presenter / email: **Kaur, Sajeev** / [ska316@uky.edu](mailto:ska316@uky.edu)  
**Postdoctoral Scholar/Fellow**  
**Basic Research**  
**Trauma**

# Oral Abstracts

## Session **CCTS-Translational**

Abstract Title: **Mapping Of Noradrenergic Neurons In Adult Offspring With Prenatal Fentanyl Exposure Using Light-Sheet Microscopy**

Author(s): C. Dalmaso, Department of Pharmacology and Nutritional Sciences; N. Ahmed, Department of Pharmacology and Nutritional Sciences; M.B. Turner, Department of Pharmacology and Nutritional Sciences; P. Ortinski, Department of Neurosciences; A. S. Loria Kinsey, Department of Pharmacology and Nutritional Sciences, University of Kentucky

**Abstract:** In addition to acute opioid toxicity inducing ventilatory depression, the chronic use and misuse of opioids can trigger cardiovascular dysfunction. Although over 20,000 newborns show severe signs of prenatal fentanyl exposure (PFE) each year, the lack of follow-up studies limits the understanding of the long-term effects on their cardiovascular health. We subjected female rats to fentanyl-self administration during gestation, which resulted in sympathetic activation and hypertension in the adult offspring. The aim of this study was to determine the effect of PFE in noradrenergic neurons density in the brain from adult offspring. Brains from PFE and vehicle-exposed from male adult offspring were fixed with 4% PFA and cleared and stained using electrophoretic-enabled device SmartBatch+ at LifeCanvas Technologies, and probed with an anti-Tyrosine Hydroxylase (TH) antibody. Samples were imaged on SmartSPIM light sheet at 3.6X magnification. The left and right sides of each area were averaged in each brain. Reduction in density (cells/mm<sup>3</sup>) were found in subthalamic nucleus, -46.3; -substantia nigra (reticular), 50.6; substantia nigra (compact), -15.6; substantia nigra (lateral), -109.1; ventral tegmental area (VTA), -15; and caudate putamen, -8. Increases in density were found in hypothalamic region (unspecified), +49.1; hypothalamic region (unspecified), +45.2; posterior thalamus, +84.9; and paraventricular thalamic nuclei, +65.1. Further, the locus coeruleus (LC), the primary site for brain norepinephrine synthesis and release, shows an increase in TH signal in brains with PFE. Further analysis of hypothalamic and brainstem regions showing increased TH+ cells could contribute to elucidating the mechanisms of neurogenic hypertension associated with PFE. Yet, reduction in TH+ cells in dopaminergic areas of the brain such as substantia nigra, VTA, and caudate putamen may indicate a high risk for motor dysfunction that needs further investigation.

Supported by: CCTS minigrant

Primary Presenter / email: **Loria Kinsey, Analia** / [analia.loria@uky.edu](mailto:analia.loria@uky.edu)  
**Faculty**  
**Translational Research/Science**  
**Alcohol/Substance Abuse**

# Oral Abstracts

## Session **CCTS-Translational**

Abstract Title: **Plasminogen Activator Inhibitor-1 Deficiency Augments Hypertension-induced Cardiac, but not Aortic Pathology in Mice**

Author(s): Alex Pettey<sup>1-3</sup>, Sohei Ito<sup>2, 3</sup>, Deborah Howatt<sup>2, 3</sup>, Michael Franklin<sup>2, 3</sup>, David Graf<sup>2, 3</sup>, Nancy Zhang<sup>2, 3</sup>, Hisashi Sawada<sup>1-3</sup>, Hong S. Lu<sup>1-3</sup>, Alan Daugherty<sup>1-3</sup>; <sup>1</sup>Department of Physiology, College of Medicine; <sup>2</sup>Saha Cardiovascular Research Center, College of Medicine; Saha Aortic Center, College of Medicine, University of Kentucky, KY.

**Abstract:** Plasminogen activator inhibitor-1 (PAI-1), the primary regulator of fibrinolysis, is highly abundant in human thoracic aortic aneurysms (TAA), and in the ascending aortas of mice infused with angiotensin II (AngII) prior to overt pathology. The purpose of this study was to determine whether deletion of PAI-1 influenced the development of TAAs. To determine the role of PAI-1 in AngII-induced pathology, whole-body PAI-1 deficient mice (PAI-1 <sup>-/-</sup>) and wild type littermates (PAI-1 <sup>+/+</sup>) were infused with AngII (1,000 ng/kg/min) for 28 days. Despite the upregulation of PAI-1 in TAA, aortic dimensions were not altered by PAI-1 deficiency. However, PAI-1 deficiency augmented grossly visible and histologically evident cardiac fibrosis, primarily within the epicardium. Because of PAI-1's role in regulating fibrinolysis, we next investigated whether cardiac hemorrhage preceded fibrosis in PAI-1 <sup>-/-</sup> mice. Profound accumulation of ferric iron, an indicator of erythrocyte degradation, was observed coincidentally with cardiac fibrosis in PAI-1 <sup>-/-</sup> mice. Ferric iron was minimally observed in PAI-1 <sup>+/+</sup> mice. To verify the presence of cardiac hemorrhage, we infused PAI-1 <sup>+/+</sup> and <sup>-/-</sup> mice with AngII for 1 and 7 days. Cardiac hemorrhage was observed grossly and histologically by 1 day of infusion in PAI-1 <sup>-/-</sup> mice. By 7 days of AngII, cardiac hemorrhage was increased in PAI-1 <sup>-/-</sup> mice compared to 1 day of infusion and was concentrated within the epicardium. To investigate whether PAI-1 deficiency induces cardiac dysfunction, PAI-1 <sup>+/+</sup> and <sup>-/-</sup> mice were infused with saline or AngII and measured by echocardiography at baseline, 7, and 28 days of infusion. While measures of systolic function were minimally altered by PAI-1 deficiency, measures of cardiac size were increased in PAI-1 <sup>-/-</sup> mice infused with AngII, suggesting cardiomegaly. In conclusion, PAI-1 deficiency does not affect TAA formation, but induces cardiac hemorrhage and augments cardiomegaly and fibrosis in AngII-infused mice.

Supported by: NIH 5TL1TR001997-07

Primary Presenter / email: **Pettey, Alex** / alex.pettey@uky.edu  
**Graduate Student**  
**Basic Research**  
**Cardiovascular**

# Oral Abstracts

## Session **CCTS-Translational**

Abstract Title: **Enhancing TIL efficacy in NSCLC through epigenetic reprogramming and computational modeling**

Author(s): Daniel R. Plaugher, Department of Toxicology and Cancer Biology, UK; Avery R. Childress, Department of Toxicology and Cancer Biology, UK; Christian M. Gosser, Department of Toxicology and Cancer Biology, UK; Dave-Preston Esoe, Department of Toxicology and Cancer Biology, UK; Xuilong S, Department of Toxicology and Cancer Biology, UK; Jinpeng Liu, Department of Cancer Biostatistics, UK; Christine F. Brainson, Department of Toxicology and Cancer Biology and Markey Cancer Center, UK;

**Abstract:** Novel therapeutic protocols are desperately needed to treat non-small cell lung cancer (NSCLC), the world's deadliest cancer. Recently, tumor-infiltrating lymphocyte (TIL) therapy has shown promise as a viable and highly personalized approach. Yet many obstacles remain, including optimizing expansion protocols for better in vivo TIL proliferation, enhancing T cell homing and targeting post-infusion, and minimizing IL-2/lymphodepletion side effects. We hypothesize that inhibiting epigenetic enzyme EZH2 will improve TIL expansion and infusion outcomes in NSCLC patients. Additionally, we propose that stochastic modeling of gene signaling can identify and address alternative T cell suppression mechanisms, suggesting novel TIL-combination targets. In a murine NSCLC model, the EZH2 inhibitor valemestostat(Val) combined with anti-PD1 led to tumor regression, robust IFN-gamma T cell responses, increased MHC expression, pro-T cell cytokine signaling, and enhanced tumor-eliminating myeloid populations. To translate these findings to TILs, we are securing NSCLC samples from our Biospecimen Core, establishing patient-derived tumoroids, and expanding TILs ex vivo with/without Val under "young" protocols. At ex vivo endpoint TILs will be assessed for Val-driven differences in viability, differentiation, and reactivity via flow cytometry. Complementary bioinformatic and mathematical approaches using publicly available NSCLC datasets will be used to build signaling networks differentiating immunotherapy responders from non-responders that we will use predict new therapeutic targets through phenotype control theory. Given the refractory nature of advanced NSCLC, improving precision medicine options like TIL therapy is a crucial goal for the field. Our integration of bench science and computational approaches has the potential to deepen understanding and enhance therapeutic responses.

Supported by: T32 CA165990 (DRP), R01 CA237643 (CFB), R01 HL170193 (CFB), P30 CA177558 (Markey Shared Resources)

Primary Presenter / email: **Plaugher, Daniel** / [plaugher\\_dr@uky.edu](mailto:plaugher_dr@uky.edu)  
**Postdoctoral Scholar/Fellow**  
**Translational Research/Science**  
**Cancer**



# Oral Abstracts

## Session **CCTS-Translational**

Abstract Title: **Maternal opioid use with and without HCV infection disrupts the structure and immune landscape of placenta**

Author(s): H. E. True, Dept of Pharmaceutical Sciences, UK; B. M. Doratt, Dept of Microbiology, Immunology, and Molecular Genetics, UK; Q. Qiao, Dept of Biostatistics, UK; D. C. Malherbe, Dept of Microbiology, Immunology, and Molecular Genetics, UK; N. Shelman, Dept of Pathology, UK; C. Cockerham, Dept of Obstetrics and Gynecology, UK; J. M. O'Brien, Dept of Obstetrics and Gynecology, UK; I. Messaoudi, Dept of Microbiology, Immunology, and Molecular Genetics, UK.

**Abstract:** Opioid use disorder (OUD) in pregnancy and its implications on the maternal-fetal interface have been relatively understudied. Therefore, we collected placental tissue from healthy pregnancies (control) and those with OUD, with and without maternal HCV infection. First, placental development was assessed by histological examination of the placenta. Immune cells were then isolated from decidua (maternal) and chorionic villous (fetal) placental tissues, and the frequency and phenotype of immune subsets were determined by flow cytometry. Markers of inflammation, placental perfusion, growth factors, tissue remodeling, and vascularization were measured in placental tissue homogenate by multiplex Luminex assay. Finally, gene expression alterations in placental architecture were assessed by Visium spatial transcriptomics, integrating transcriptomic data with spatial information. Our results indicate that maternal OUD impairs placental perfusion/development and is accompanied by increased markers of inflammation (IL-6, IL-1 $\beta$ ). Furthermore, markers of angiogenesis and placental development are altered in the decidua, including increased EGF and IL-6Ra but decreased FLT-1, FLT-4, and bFGF. The abundance of placental immune cells is varied with OUD/HCV, including decreased frequencies of decidual macrophages and NK cells, critical for blood supply to the fetus, and increased abundance of infiltrating maternal macrophages in fetal chorionic villous. Finally, spatial transcriptomics revealed aberrant infiltration of activated immune cells and modified processes associated with inflammation and angiogenesis. Altogether, these findings suggest a profound impact of maternal OUD with and without maternal HCV infection on the immune landscape of the maternal-fetal interface that can alter fetal development and maturation.

Supported by: This study was supported by grants from the National Institutes of Health: 1R01DA059152-01 (IM), 7R01AI145910-05S1(IM), TL1TR001997 (HT) and pilot funding from the University of Kentucky, including the Clinical and Translational Science Substance Use Disorder pilot grant (IM).

Primary Presenter / email: **True, Heather** / heather.true@uky.edu  
**Graduate Student**  
**Basic Research**  
**Alcohol/Substance Abuse**

# Oral Abstracts

## Session **CCTS-Translational**

Abstract Title: **UKY-86 as a Novel Pharmacological Treatment for Methamphetamine Use Disorder (MUD)**

Author(s): M. E. Wardell, Department of Psychology, U of Kentucky; J. D. Shaykin, Department of Psychology, U of Kentucky; E. D. Denehy Department of Psychology, U of Kentucky; K. R. Guy College of Pharmacy, University of Kentucky; L. P. Dvoskin College of Pharmacy, University of Kentucky; M. T. Bardo Department of Psychology, U of Kentucky

**Abstract:** Purpose: Methamphetamine use disorder (MUD) involves persistent use despite adverse consequences, relapse, and social dysfunction, with overdose deaths rising from 547 in 1999 to 32,537 in 2021 (NIDA, 2023). Currently, no FDA-approved pharmacotherapies exist for MUD. Our laboratory has been investigating UKY-86 as a potential therapeutic. UKY-86 is a selective VMAT2 inhibitor that targets methamphetamine-induced dopamine release mechanisms. We have shown previously that UKY-86 dose-dependently decreases methamphetamine self-administration in rats. The current study determined if UKY-86 has abuse liability.

Methods: Sprague-Dawley rats (n=12; PND 55) underwent jugular catheterization and 1-hour daily self-administration sessions using a standard 2-lever operant conditioning procedure and a terminal FR5 schedule of reinforcement. Rats self-administered UKY-86 (n=6; 3-100 µg/kg/infusion) or saline (n=6) with the unit dose of UKY-86 increasing every three sessions. Rats previously self-administering UKY-86 were then switched to methamphetamine self-administration as a positive control and to evaluate catheter patency.

Results: The number of self-infusions between UKY-86 and saline groups did not differ significantly. When switched to methamphetamine self-administration, rats exhibited significantly higher response rates compared to UKY-86, demonstrating that methamphetamine has reinforcing properties, while UKY-86 does not. Furthermore, the results with methamphetamine indicate that the reason that responding did not occur with UKY-86 was not due to a lack of catheter patency.

Conclusion: UKY-86 shows promise as a potential pharmacotherapy for MUD and may enhance recovery when combined with psychosocial therapy. While further testing is required to ensure safety in humans, UKY-86 may play a critical role in improving MUD treatment success rates.

Supported by: Summer Undergraduate Research Award (SURA) from the College of Arts & Sciences, and the Substance Use Research Priority Area (SUPRA) from the Office of the Vice-President for Research, and Center for Clinical and Translational Science (CCTS) through NIH grant ULTR001998.

Primary Presenter / email: **Wardell, Mallory** / mewa276@uky.edu  
**Undergraduate Student**  
**Translational Research/Science**  
**Alcohol/Substance Abuse**

# Oral Abstracts

## Session COM

Abstract Title: **Frailty in Chronic Pancreatitis Linked to Worse Inpatient Outcomes**

Author(s): Waqas Rasheed, Division of Hospital Medicine; Kshitij Thakur, Division of Gastroenterology and Hepatology; Kristen McQuerry, Biostatistics; Kelsey Karnik, Biostatistics; Darwin L. Conwell, Internal Medicine; Radmila Choate, Epidemiology & Environmental Health, University of Kentucky, Lexington, KY

**Abstract:** Frailty is a state of reduced resistance to stressors leading to adverse healthcare outcomes. Patients with chronic pancreatitis (CP) are particularly vulnerable due to malabsorption and inflammation leading to malnutrition and muscle wasting. Therefore, this study aims to investigate the impact of frailty on inpatient outcomes in individuals with CP using the Hospital Frailty Risk Index (HFRS).

Methods: Inpatient data were obtained from the National Inpatient Sample database (2016-2020). Data analysis was performed using SAS version 9.4. Inclusion criteria required a primary diagnosis of CP. Patients were categorized into frail (HFRS $\geq$ 5) and non-frail (HFRS $<$ 5) groups. A subset of patients was matched 1:1 based on propensity scores derived from baseline characteristics and the Elixhauser Comorbidity Index.

Results: One-fourth (25.45%) of the patients hospitalized with a primary diagnosis of CP were found to be frail. Frail CP patients had a greater need for critical care services (2.7% vs. 0.6%, P-value $<$ 0.0001), a longer length of stay (6.08 vs. 4.18 days, P-value $<$ 0.0001), higher hospitalization charges (\$62,729 vs. \$42,855, P-value $<$ 0.0024), as well as a greater need for home health and inpatient rehabilitation services (P-value $<$ 0.0001).

Conclusion: This study shows that frailty in CP leads to increased severity of illness as indicated by a higher need for critical care services, and greater healthcare resources utilization, indicated by a longer length of stay and higher hospitalization charge. A greater utilization of home health and inpatient rehabilitation services indicates a slower recovery in frail patients. This underscores the importance of developing tailored treatment approaches for frail patients.

Supported by:

Primary Presenter / email: **Choate, Radmila** / waqas.rasheed@uky.edu  
**Faculty**  
**Clinical Research**  
**GI**

# Oral Abstracts

## Session COM

Abstract Title: **Hematological and Cytokine Alterations in a Rat Model of Sepsis Survivor following Spinal Cord Injury**

Author(s): T. Garg\*, K. Iyer\*, D. Patel, K. Zamiar, J. Patel, D. Winchester, Spinal Cord and Brain Injury Research Center and Department of Physiology; S. Rippey, Departments of Surgery and Physiology; H. Saito, Departments of Surgery and Physiology, U of Kentucky; S. P. Patel Spinal Cord and Brain Injury Research Center and Department of Physiology, U of Kentucky

**Abstract:** Sepsis is an infectious dysregulated inflammatory response that could lead to organ failure, tissue damage, and in severe cases, death. If sepsis occurs acutely after spinal cord injury (SCI), it is associated with poorer long-term functional outcomes and increased mortality. Major goal of the current study is to establish rodent model of sepsis survivor following SCI and to identify blood biomarkers.

In this study, rats were divided into four experimental groups: sham, SCI, sepsis, and SCI+Sepsis. Spinal cord was contused at the T10 spinal level at 200 kDyn using an Infinite Horizon (IH) Impactor. At 15 min post-SCI, sepsis was induced by injecting (i.p.) 3 mL of cecal slurry. Rats received antibiotic treatment and fluid resuscitation, beginning 8 hours post-SCI/sepsis and continuing twice daily for the next five days. Blood samples were collected at 24 hours, 72 hours, and 7 days post-injury. Whole blood was used for Complete Blood Count (CBC) analysis and serum for ELISA to quantify inflammatory cytokines.

CBC analysis revealed a decrease in red and white blood cell counts, along with reduced hemoglobin levels, indicating impaired oxygen-carrying capacity following SCI, sepsis, and SCI+Sepsis in a time-dependent manner, with a more pronounced effect in the SCI+Sepsis group. These findings align with increased inflammation observed in cytokine analysis of serum samples, which showed elevated levels of IL-6 and TNF- $\alpha$ . Additionally, IL-1 $\beta$ , IL-10, and IFN- $\gamma$  levels were differentially affected. A detailed analysis of differential blood parameters is ongoing and will be correlated with functional outcomes.

Supported by: This project was supported by funding from the National Institutes of Health (NIH), including grant 1R21NS128749-01A1 (SP/HS) from the National Institute of Neurological Disorders and Stroke (NINDS) and grant P20 GM148326 from the National Institute of General Medical Sciences (NIGMS), U.S. Department of Health and Human Services.

Primary Presenter / email: **Garg, Tanisha** / tanisha.garg@uky.edu  
**Undergraduate Student**  
**Basic Research**  
**Trauma**

# Oral Abstracts

## Session **COM**

Abstract Title: **Variants of Unknown Clinical Significance (VUSs) in Pediatric Cancer Patients at the University of Kentucky**

Author(s): A. Graden, U of Kentucky College of Medicine; J. Tate, C. Sears, S. Zhang, Department of Pathology, U of Kentucky; J. Miller, The Kentucky Cancer Registry, U of Kentucky; N. Holcomb, The Markey Cancer Center, U of Kentucky; N. Hawes, A. Harrington, J. D'Orazio, Division of Pediatric Hematology/Oncology, U of Kentucky, Lexington, KY.

**Abstract:** Inherited cancer risk due to pathogenic variants affects approximately 8-10% of pediatric cancer diagnoses. Germline cancer genetic testing may identify genes that cannot be categorized as benign or pathogenic based on current knowledge and are therefore labeled as variants of uncertain significance (VUSs). Determining relationships between VUSs, pathogenicity, and health disparities supports secondary prevention for families with inherited cancers. Our study used focused exome sequencing and selective analyses of 81 pediatric cancer predisposition-associated genes. To date, over 225 patients with pediatric malignancies treated at the University of Kentucky have been enrolled. Variants were classified as benign, likely benign, VUS, likely pathogenic, and pathogenic, with patient demographic data extracted from electronic health records. Preliminary results indicate that VUSs and pathogenic variants are more commonly observed in early childhood and teenage patients. Both were identified across central and eastern Kentucky, with 55% of VUSs originating from Appalachia. Most counties with VUSs have socioeconomic data below Kentucky's averages. Several genes were associated with four or more VUSs. In contrast to national trends, a higher percentage of VUSs were found in patients with lymphoma, renal, soft tissue, and bone cancers. Variants of uncertain significance are present in Kentucky's pediatric cancer population, with socioeconomic differences between affected communities and state averages. If certain VUSs are re-designated as pathogenic, socioeconomic factors will likely influence cancer surveillance and outcomes. Future work will focus on developing a pipeline to identify VUSs warranting closer monitoring.

Supported by: This research is supported University of Kentucky Markey Cancer Center (P30CA177558); Professional Student Mentored Research Fellowship Project funded by the National Center for Advancing Translational Sciences (UL1TR001998), UK HealthCare and the University of Kentucky College of Medicine. We thank the Joy Wills Endowment for Childhood Cancer Research, the DanceBlue Golden Matrix Fund, support from Beau and Gail Lane, and Jim and Stacy Richardson.

Primary Presenter / email: **Graden, Alexander / awgr230@uky.edu**  
**Professional Student (MD, PharmD, Dentistry, PT)**  
**Clinical Research**  
**Cancer**

# Oral Abstracts

## Session COM

Abstract Title: **Distal Interlocking Screw Backout in New-Generation Retrograde Femoral Nails: A Retrospective Comparative Study**

Author(s): A. N. Musick, Department of Orthopedic Surgery, MGH; R. K. Wagner, MD, Department of Orthopedic Surgery, MGH; K. M. Kraus, BS, U of Kentucky; W. G.S. Southall, BS, U of Kentucky; A. T. Gregg, BS, Department of Orthopedic Surgery, MGH; T. J. Policicchio, BA, Department of Orthopedic Surgery, MGH; M. Muhammad, MD Department of Orthopedic Surgery, MGH; S. T. Duncan, MD, U of Kentucky; D. C. Landy, MD, PhD, Ortho Virginia; A. Aneja, MD, PhD, Department of Orthopedic Surgery, MGH

**Abstract:** INTRODUCTION: The RFNA-Advanced and the T2 Alpha Nails differ in their distal interlocking designs. Recent studies have raised concerns about distal interlocking screw backout with the RFNA, reporting rates as high as 23–30%. The primary objective of this study was to compare distal interlocking screw backout rates between these two nails.

METHODS: This retrospective comparative study included adult patients with diaphyseal or distal femur fractures between 2022 and 2024 treated with an RFNA/T2 Alpha Nail at three centers. The primary outcome was the distal interlocking screw backout rate. Secondary outcomes included time to backout and reoperation rates for screw removal. Outcomes were compared between the RFNA and T2 Alpha.

RESULTS: 103 patients (mean age 59 years [IQR: 38–73], 61% female) were included, with 24 treated with the RFNA and 79 with the T2 Alpha. Backout rates were significantly higher in the RFNA group (38% [95% CI: 20–59%] vs. 5.1% [95% CI: 1.6–13%]). Stratified by fracture location, backout remained higher in the RFNA group for both diaphyseal (6/20 [30%] vs. 1/43 [2.3%]) and metaphyseal fractures (3/4 [75%] vs. 3/36 [8.3%]). Time to backout was earlier in the RFNA group (5 weeks [IQR: 3–6] vs. 19 weeks [IQR: 14–31]). Reoperation rates for screw removal were higher in the RFNA group (21% vs. 0%).

CONCLUSION: The RFNA was associated with a significantly higher rate of distal interlocking screw backout, an earlier time to backout, and an increased reoperation rate for screw removal compared to the T2 Alpha.

Supported by:

Primary Presenter / email: **Kraus, Kameron** / kam.kraus@uky.edu  
**Professional Student (MD, PharmD, Dentistry, PT)**  
**Clinical Research**  
**Orthopedic**

# Oral Abstracts

## Session **COM**

**Abstract Title:** **Timeline of B Cell Maturation in the Skull, Femur, and Dura After Ischemic Stroke in Mice**

**Author(s):** A. McAtee, Department of Neuroscience, U of Kentucky; M. Byrd, Department of Neuroscience, U of Kentucky; H. Murphy, Department of Neuroscience, U of Kentucky; J. Turchan-Cholewo, Department of Neuroscience, U of Kentucky; D. Mercurio, Department of Neuroscience, U of Kentucky; K. Cotter, Department of Neuroscience, U of Kentucky; C. Stuart, Department of Neuroscience, U of Kentucky; A. Stowe, Department of Neurology, U of Kentucky

**Abstract:** It is unknown if, after ischemic stroke, B cell development is induced in the skull and dura, and what roles cells from these areas may play in the post-stroke brain. Therefore, the aim of this project is to determine the timeline of B cell proliferation in the skull, femur, and dura after ischemic stroke. Young (2-14 mos.) male (n=5-6/group) and female (n=7-11/group) C57Bl/6J mice underwent 60-min. MCA occlusion, and femur and skull bone marrow plus dura were processed into single cell suspensions, stained for general leukocyte markers, and analyzed by flow cytometry at 3 days and 3 weeks compared to naïve controls. Cell counts were determined in FlowJo and two-way ANOVA for sex, and time since injury were performed with Sidak's multiple comparisons (GraphPad). Immunohistochemistry on dura with staining for B220, GL7, and CD3 is ongoing. B cells decreased in the femur ( $p < 0.05$ ) and dura ( $p < 0.01$ ) at 3 days post-stroke and in the skull at 3 weeks ( $p < 0.001$ ). When groups were split by sexes, two-way ANOVA on number of B cells in the skull was significant for both sex ( $p < 0.01$ ) and time since injury ( $p < 0.0001$ ), with males showing a significant decrease at 3 days and females showing a significant increase at 3 weeks. These results suggest that the skull, femur, and dura have distinct roles in the B cell response to stroke. Ongoing analysis aims to quantify T cells, antigen presenting cells, and GL7+ cells in these locations after stroke and studies are being repeated in aged mice.

Supported by: NIH Awards: NS077889 and R01NS088555

Primary Presenter / email: **McAtee, Annabel** / ammc230@uky.edu  
**Graduate Student**  
**Translational Research/Science**  
**Neuroscience**

# Oral Abstracts

## Session **COM**

Abstract Title: **Cardiac remodeling, recognition memory deficits and accelerated aging in rat females with prior gestational diabetes**

Author(s): Vivek K Pandey, Sathya Velmurugan, Nirmal Verma, Deepak Kotiya, Florin Despa, Sanda Despa, Department of Pharmacology and Nutritional Sciences, University of Kentucky, Lexington, KY

**Abstract:** Aims/hypothesis: Women with prior gestational diabetes mellitus (GDM) have a higher incidence of age-associated diseases, including type 2 diabetes, cardiovascular disease, and cognitive impairment. Human studies cannot readily determine whether GDM causes these conditions and the underlying mechanisms. Here we used a well-validated rat model of GDM to address these questions.

Methods/Results: Rats with beta cell-specific expression of human amylin, a pancreatic hormone, were used as a GDM model. Five-month-old rat females were randomly assigned to no-pregnancy, one-pregnancy, and two-pregnancies experimental groups. Glucose tolerance tests and transthoracic echocardiography were performed at baseline and during the postpartum period. At 18 months of age, rats were administered the novel object recognition test, followed by euthanasia and organ collection. All females developed glucose intolerance, cardiac remodeling, and impaired left-ventricular relaxation with aging. Females with two GDM-complicated pregnancies had increased left-ventricular mass compared to the other groups following the second pregnancy and till the end of the study. At 18 months of age, females with prior GDM pregnancies presented aggravated demyelination, particularly in the hippocampus and mid-brain region, oxidative stress, and neuroinflammation, and had a lower recognition index in the novel object recognition test compared to nulliparous females. Higher parity exacerbated these effects. Shorter telomeres and reduced mitochondrial DNA content, two hallmarks of biological aging, were found in the brain, heart and pancreas of rats with prior GDM.

Conclusions: These findings support the concept that GDM is a sex-specific risk factor for aging-associated diseases and point to accelerated cellular aging as a contributing mechanism.

Supported by: NIH awards: HL148443, and HL135000 to S.D., NS116058 and AG057290 to F.D.  
AHA award: 19TPA34850094 to S.D.

Primary Presenter / email: **Pandey, Vivek** / vivek.pandey@uky.edu  
**Postdoctoral Scholar/Fellow**  
**Basic Research**  
**Cardiovascular**



# Oral Abstracts

## Session COM

Abstract Title: **Dim Light at Night Causes a Loss in the 24-hour Rhythm of Heart Rate in db/db Mice**

Author(s): A. Prabhat, Departments of Physiology, U of Kentucky; S. Naidu, Departments of Physiology, U of Kentucky; I. Stumpf, Departments of Physiology, U of Kentucky; T. Seward, Departments of Physiology, U of Kentucky; E. A. Schroder, Departments of Physiology, U of Kentucky, Departments of Internal Medicine, U of Kentucky; B. P. Delisle, Departments of Physiology, U of Kentucky

**Abstract:** db/db mice and people with T2D can develop cardiovascular autonomic neuropathy, characterized by decreased heart rate responsiveness to autonomic signaling. Recent technological advances have led to increased and widespread light exposure at night, and recent studies suggest dim light at night (dLAN) disrupts the 24-hour regulation of the heart rate by the autonomic nervous system. We hypothesized that dLAN would have a more pronounced impact on the 24-hour regulation of heart rate in db/db mice. Three to four-month-old control and db/db female mice were implanted with telemetry devices to continuously record heart rate and core body temperature. Mice were housed in 12 h light: 12 h dark cycles (12LD, 200 lux: 0 lux) with ad libitum food in thermoneutral housing followed by 12 h light: 12 h dim light cycles (dLAN; 200 lux: 5 lux) for one week. In 12LD, all control (5/5 mice) and db/db mice (4/4 mice) showed a significant 24-hour rhythm in heart rate with a higher daily rhythmic mean (mesor) heart rate in db/db mice. Following exposure to dLAN, all the control mice (5/5) showed a significant 24-hour rhythm in heart rate with reduced amplitude and loss of rhythms in db/db mice (0/4 mice). Detrended cross-correlation analysis shows a larger time lag in the 24-hour fluctuations between heart rate and core body temperature in db/db (9-20 min) vs controls (3-6 min). These data suggest that dim light at night has a more deleterious effect on the 24-hour regulation of the heart rate in db/db mice.

Supported by: National Center for Research Resources and the National Center for Advancing Translational Sciences, National Institutes of Health, through Grant UL1TR001998 to Prof. Brian Delisle, the Pathway to Independence Grant 2025 by Diabetes and Obesity Research Priority Area, and the Barnstable Brown Diabetes and Obesity Center

Primary Presenter / email: **Prabhat, Abhilash** / apr288@uky.edu  
**Postdoctoral Scholar/Fellow**  
**Translational Research/Science**  
**Cardiovascular**

# Oral Abstracts

## Session **COM**

Abstract Title: **Conserved cis-regulatory elements are critical for circadian regulation of human ion channel gene promoters in the heart**

Author(s): Ezekiel Rozmus, Department of Physiology, U of Kentucky; Alexander Alimov, Department of Physiology, U of Kentucky; Isabel Stumpf, Department of Physiology, U of Kentucky; John McCarthy, Department of Physiology, U of Kentucky; Brian Delisle, Department of Physiology, U of Kentucky; Elizabeth Schroder, Department of Physiology, U of Kentucky

**Abstract:** Background: The circadian clock plays a fundamental role in regulating cardiovascular function. RNA sequencing of mouse ventricles identified ~13,000 transcripts, with a few ion channel genes (Kcnh2, Gja1) exhibiting 24-hour oscillations in expression.

Hypothesis: Core circadian clock and associated proteins interact with conserved cis-regulatory elements in the human KCNH2 and GJA1 promoters to regulate their circadian and overall expression.

Methods: Real-time bioluminescence (LumiCycle, Actimetrics) and Dual Glo luciferase assays were used to analyze cloned promoter-luciferase reporter constructs expressed in C2C12 myoblasts. Bioluminescence was recorded at 10-minute intervals for 7 to 10 days to analyze the period, phase, and amplitude of promoter activity. Promoter variants were generated via targeted deletions and mutagenesis to introduce naturally occurring single-nucleotide polymorphisms (SNPs).

Results: The KCNH2 promoter exhibited robust 24-hour oscillations in C2C12 cells. Deletion and mutational analyses identified a highly conserved tandem E-box element within 1 kb of the exon 1 start site as critical for both circadian and overall KCNH2 promoter activity. SNPs within this element produced variant-specific effects on promoter activity. Deletion analysis of the GJA1 promoter revealed a region whose removal significantly enhanced both circadian and overall expression, indicating a suppressive function.

Conclusions: Our data demonstrate that conserved cis-regulatory elements regulate the rhythmic promoter activity of KCNH2 and GJA1. We identified a critical tandem E-box element in KCNH2, and a suppressor region in GJA1. SNPs in the KCNH2 E-box element differentially affect promoter activity, suggesting potential physiological consequences of genetic variation in this region. These findings advance our understanding of the molecular mechanisms linking circadian rhythms to cardiac electrophysiology.

Supported by: This project is funded by NIH R01HL153042 and pilot funding from the Circadian and Sleep Health for a better Kentucky (CASH-KY) at the University of Kentucky

Primary Presenter / email: **Rozmus, Ezekiel** / Ezekiel.Rozmus@uky.edu  
**Graduate Student**  
**Translational Research/Science**  
**Cardiovascular**

# Oral Abstracts

## Session **IM**

Abstract Title: **Cdkn2a Variants exacerbate DNA Damage-Associated Myocardial Fibrosis in Various Cardiomyopathies**

Author(s): N. Daneshgar, Department of Physiology, U of Kentucky; Division of Cardiovascular Medicine, U of Kentucky; T. Kampourakis, Department of Physiology, U of Kentucky; Division of Cardiovascular Medicine, U of Kentucky; K. S. Campbell, Department of Physiology, U of Kentucky; Division of Cardiovascular Medicine, U of Kentucky

**Abstract:** Fibrosis is central to myocardial repair after infarction and in heart failure, yet excessive fibrotic remodeling contributes to cardiac dysfunction. Recent evidence implicates DNA damage and premature cellular senescence—mediated by the p16 protein encoded by Cdkn2a—in the regulation of tissue fibrosis, although its role in the heart remains unclear. We hypothesized that Cdkn2a variants may disrupt the DNA damage response and senescence pathways, thereby promoting adverse myocardial fibrosis in cardiomyopathies.

We analyzed genomic data from 349 patients in our cardiac biobank with various cardiomyopathies to identify single nucleotide variants (SNVs) in Cdkn2a. Seven unique SNVs were detected in 27 patients, encompassing both ischemic and non-ischemic etiologies. Myocardial tissues from these patients were evaluated for DNA damage using gamma-H2AX immunostaining. Additionally, in silico analyses were performed to predict the impact of these variants on p16 protein stability and protein–protein interactions.

Cardiac tissues harboring Cdkn2a variants demonstrated significantly elevated gamma-H2AX levels compared with controls (ischemic:  $p = 0.0003$ ; non-ischemic:  $p < 0.0001$ ), indicating increased DNA damage. Moreover, in silico analyses predicted that these variants compromise p16 protein stability and protein–protein interactions, thereby reinforcing their contribution to adverse cardiac remodeling and fibrosis.

Our study reveals that Cdkn2a variants correlate with increased DNA damage and fibrosis in cardiomyopathy patients, implicating dysfunctional p16-mediated senescence in pathological cardiac remodeling. These findings provide a rationale for further exploration of DNA damage-targeted therapies to mitigate fibrosis in heart disease.

Supported by: NIH reward: R01HL163977 and NIH reward: R01HL173989

Primary Presenter / email: **Daneshgar, Nastaran** / [nastaran.daneshgar@uky.edu](mailto:nastaran.daneshgar@uky.edu)  
**Postdoctoral Scholar/Fellow**  
**Translational Research/Science**  
**Cardiovascular**

# Oral Abstracts

## Session **IM**

Abstract Title: **Deletion of Carnitine Palmitoyltransferase 1a from Adipocytes Leads to Insulin Resistance in Female Mice**

Author(s): N. Dharanipragada, Department of Internal Medicine, U of Kentucky; G. B. Anspach, Department of Internal Medicine, U of Kentucky; Robert N. Helsley, Department of Internal Medicine, U of Kentucky

**Abstract:** Background: Carnitine palmitoyltransferase 1 (CPT1) is the rate-limiting enzyme in mitochondrial fatty acid oxidation (FAO). Our laboratory and others have shown that CPT1a is the most abundant CPT1 enzyme in white adipose tissue (WAT) in mice and humans, prompting an investigation into its role in adipocyte biology. Methods: CRISPR-Cas9N was used to delete CPT1a in 3T3-L1 fibroblasts. WT and CPT1a KO cells were used to study adipocyte differentiation and insulin responses in-vitro. For in-vivo studies, eight-week old male and female AKO (Cpt1a $\Delta$ Adipo) and littermate controls (Cpt1a $F/F$ ) were placed on a high-fat diet (HFD; 60% kcal fat) for 16 weeks. Glucose and insulin tolerance tests were completed after 11 and 13 weeks on diet. Mice were necropsied after a 16 hour fast, and tissues and serum were collected for insulin and C-peptide analysis, bulk RNA sequencing, and protein expression by immunoblotting.

Results: Murine 3T3L1 KO cells exhibited increased adipocyte differentiation, which was accompanied by a ~50% increase in triglycerides and a 4-5 fold increase in expression of known adipogenic markers. Despite comparable IR $\beta$  phosphorylation, fully differentiated KO adipocytes had reduced Akt and Erk phosphorylation in response to insulin treatment, as compared to controls. Deletion of CPT1a from adipose tissue of female mice resulted in increased body weight and subcutaneous adiposity in response to HFD, as compared to littermate controls. Further, female Cpt1a $\Delta$ Adipo mice displayed a 2-fold increase in fasting insulin and insulin to C-peptide ratios, which coincided with glucose intolerance and insulin resistance in these mice. No changes were observed in male mice across all parameters tested.

Conclusions: Deletion of CPT1a in adipose tissue promotes sex-specific responses in adiposity and insulin resistance. Future research will determine mechanisms by which substrates and products of CPT1a impact insulin signaling in adipocytes.

Supported by: This work was supported in part by the National Institutes of Health grants K01DK128022, IRG2215234, UL1TR001998, P30GM127211, and by an AHA CDA 23CDA1051959 to RNH. This work was also supported by the Undergraduate Summer Training in Cardiovascular Research at the University of Kentucky to ND.

Primary Presenter / email: **Dharanipragada, Nikitha** / ndh226@uky.edu  
**Undergraduate Student**  
**Basic Research**  
**Internal Medicine**

# Oral Abstracts

## Session IM

Abstract Title: **Evaluation of Privacy-Focused Endoscopy Data Extraction Using a Lightweight Open-Source Local Language Model**

Author(s): R. J. Fine, U of Kentucky College of Medicine; B. Ismail, Department of Internal Medicine-Digestive Health, U of Kentucky; H. G. Darnell, Department of Internal Medicine, U of Kentucky

**Abstract:** Large language models (LLMs) have shown varying capabilities in healthcare data extraction. However, commercial LLMs require data to be sent to remote servers, making them unsuitable for handling identified patient information.

This study evaluates the performance of a light-weight open-source LLM (gemma2:9b-instruct-q4\_0) in a local setting. We tested the model's ability to extract 23 variables from upper endoscopy reports (n=88) using a standard work computer (Intel i5-10500 CPU, 16 GB RAM, Windows 10, no GPU). The extraction process utilized a detailed instruction-based zero-shot prompt, providing specific descriptions for each variable. This set-up ensured complete on-device processing without external data transmission.

The median agreement between LLM and human extractions was 93% (range: 78-100%), with 23 reports achieving 100% agreement, 66 exceeding 90%, and only 2/88 reports falling below 80% agreement. Overall agreement for individual variables was high, with a median kappa of 0.89 (range: 0.6-1.0). All variables except one (patulous esophagus detection) showed statistically significant agreement ( $p < 0.05$ ). Perfect agreement (kappa=1) was noted for 8 variables, while 8 had excellent agreement (kappa > 0.9). However, 7 variables showed suboptimal agreement (kappa < 0.8). When we re-ran the model to extract only these 7 low-agreement variables, performance improved, with 2 variables (recommended repeat scope and recommended repeat interval) reaching kappa > 0.8.

The described approach offers an accessible, privacy-preserving tool for automated data extraction using available standard computer hardware, promising for healthcare settings prioritizing data security. While challenges persist with certain variable types, our results reveal significant optimization potential when extracting fewer variables concurrently.

Supported by:

Primary Presenter / email: **Fine, Rebecca / rfi236@uky.edu**  
**Professional Student (MD, PharmD, Dentistry, PT)**  
**Translational Research/Science**  
**GI**

# Oral Abstracts

## Session **IM**

Abstract Title: **Obesity-Associated Inflammatory Responses are Significantly Modified by Insulin Sensitivity and Sex**

Author(s): A. Javidan, Department of Pharmacology and Nutritional Sciences, U of Kentucky; L. Bharath, Merrimack College; E. Tevonian, Massachusetts Institute of Technology; B. Marrah, UW-Madison; A. Konopka, School of Medicine and Public Health, UW-Madison; B. Miller, Oklahoma Medical Research Foundation; M. Bubak, Oklahoma Medical Research Foundation; D. A. Lauffenburge, Massachusetts Institute of Technology; B. S. Nikolajczyk, Department of Microbiology, Immunology and Molecular Genetics, U of Kentucky

**Abstract:** Introduction: Systemic inflammation promotes insulin resistance (IR) and comorbidities like type 2 diabetes. Multiple CD4<sup>+</sup> T cell subsets support inflammation in people with excess weight or obesity (herein, obesity). Autophagy is one key mechanism that regulates T cell-generated cytokines and thus inflammation. We tested the hypothesis that obesity-associated changes in T cell autophagy support inflammation and declines in metabolic health by analyzing T cells from obese insulin-sensitive (IS) and IR subjects for cytokine production utilizing a single-cell proteomics platform, and for indicators of autophagy.

Methods: Archived PBMCs from IS (HOMA-IR < 2.2; N=7) or IR (HOMA-IR > 2.5; N=7) subjects (BMI avg. 32.5, avg age 56.3 yrs) were recovered overnight with IL-2. CD4<sup>+</sup> T cells were negatively isolated from PBMCs using magnetic beads, then stimulated with phorbol ester and ionomycin for 1.5-6 hours to induce (1) autophagy, analyzed by confocal microscopic quantification of lipidated LC3, p62, and LAMP1; and (2) inflammation, based on combinatorial cytokine profiles generated by partial least squares discriminant analysis of up to 25 cytokines produced by each cell.

Results: T cells from IR compared to IS subjects produced a cytokine profile dominated by IL-12 that was similar to a type 2 diabetes T-cell profile. T cells from men compared to women unexpectedly produced a more inflammatory profile. Confocal analysis showed defective autophagy in the IR group compared to IS, as indicated by reduced lipidated LC3B, increased p62, and decreased LC3B/LAMP1 colocalization.

Conclusions: Obesity-associated IR is a more inflamed state than IS (as expected), with CD4<sup>+</sup> T cells from men specifically showing more production of cytokines typical of type 2 diabetes.

Supported by: National Institute on Aging: R01AG079525-03

Primary Presenter / email: **Javidan, Aida** / aja252@uky.edu  
**Staff**  
**Translational Research/Science**  
**Obesity and Diabetes**

# Oral Abstracts

## Session **IM**

Abstract Title: **From Acute Coronary Syndromes and Cardiomyopathy to Fatal Arrhythmias: Re-challenging 5-Fluoropyrimidine Cardiotoxicity**

Author(s): S.E. McMurtry, Department of Internal Medicine, U of Kentucky; S.A. Sertich, Department of Hematology and Oncology, Markey Cancer Center, U of Kentucky; A. Arbune, Department of Cardiovascular Medicine, Gill Heart Center, U of Kentucky

**Abstract:** 5-fluorouracil (5-FU) and capecitabine, are superior chemotherapeutic agents for gastrointestinal and breast cancers. 5-FU cardiotoxicity manifesting as acute coronary syndrome (ACS) or cardiomyopathy was previously a strict contraindication for continued 5-FU exposure due to the risk of recurrence. Several case studies have evaluated rechallenging using anti-anginal medications, such as nitrates and calcium channel blockers, before, during, and after exposure to 5-FU or capecitabine. While short-term studies have revealed favorable results including no further episodes of acute coronary syndrome with repeat exposure, long-term cardiovascular and oncologic outcomes have not been investigated. Fifty-six patients presented to the Cardio-Oncology clinic at the University of Kentucky from October 2020 to November 2024 who were exposed to 5-FU or capecitabine. Of the 56 patients, ten of those were re-exposed to 5-FU or capecitabine using re-challenge protocol with either nifedipine/ diltiazem and isosorbide mononitrate. Nine out of the ten did not have recurrent chest pain or ACS; one patient continued to have anginal chest pain after 5FU discontinuation. No patients had major adverse cardiovascular events and all patients who previously had reduced cardiac function after cardiotoxicity had improvement in their ejection fraction within a 6-month period. For oncologic outcomes, the average number of chemotherapy cycles patients were able to tolerate was 6.1 cycles with one patient completing 29 cycles. The average survival months after 5-FU cardiotoxicity was 16.6-months. While positive cardiovascular outcomes are seen with re-exposure to 5-FU or capecitabine, further studies on oncologic outcomes are needed in comparison to patients who pursued inferior treatments.

Supported by:

Primary Presenter / email: **McMurtry, Shyla** / semc271@uky.edu  
**Medical Resident/Fellow**  
**Clinical Research**  
**Cardiovascular and Oncology**

# Oral Abstracts

## Session **IM**

Abstract Title: **Edaravone Protects the Hippocampus from Brain Damage Following Insulin-Induced Severe Hypoglycemia**

Author(s): A. Thompson, PNS, UK; N. Phelps, IM-Endocrinology, UK; H. Riley, IM-Endocrinology, UK; M. Wooten, IM-Endocrinology, UK; A. Marksby, IM-Endocrinology, UK; E. Brockman, IM-Endocrinology, UK; L. Schoeder, IM-Endocrinology, UK; Z. Beckner, PNS, UK; M. Devore, PNS, UK; I. Papazoglou PhD, IM-Endocrinology, UK; S.J. Fisher MD PhD, IM-Endocrinology and PNS, UK; University of Kentucky (UK); Departments of Internal Medicine (IM)-Endocrinology, Pharmacology and Nutritional Sciences (PNS)

**Abstract:** Introduction and Objective: To determine if Edaravone, a free radical scavenger and neuroprotective agent with antioxidant properties, could prevent brain damage following insulin-induced severe hypoglycemia in a rodent model.

Methods: 10-week-old Sprague-Dawley rats were divided into three treatment cohorts: 1) euglycemic controls, 2) rats treated with insulin-induced (15U mg/kg) severe hypoglycemia (SH: 10-15mg/dL for 90 minutes), and 3) rats similarly treated with SH followed by once daily treatment with Edaravone (3mg/kg) (SH+EDV). After one week animals were euthanized, perfused and brains extracted. Sections from the hippocampus (40µm) were stained for 1) cell death with Fluoro-Jade C (FJC) and Cleaved Caspase 3 (CC3), 2) neuronal inflammation with Iba-1/CD68, and 3) oxidative stress with 4-Hydroxynonenal (4HNE). Stains were analyzed using ImageJ and one-way ANOVA.

Results: As compared to euglycemic controls, severe hypoglycemia increased Iba-1/CD68 (10-fold), CC3 (30-fold), FJC (15-fold) and 4HNE (11-fold) ( $p < 0.01$  vs controls). As compared to SH alone, SH+EDV reduced all stained cells to a level not different from controls ( $p = NS$  vs controls).

Conclusion: Edaravone protected the brain from severe hypoglycemia induced cell death indicated by FJC and CC3 immunohistochemistry staining. Edaravone also reduced neuronal inflammation indicated by reduced Iba-1/CD68 staining, and reduced oxidative stress as indicated by 4HNE staining. Based on this data, post-hypoglycemia treatment with Edaravone could be a potential therapeutic intervention for those who experience severe hypoglycemia.

Supported by: NIDDK award: R01DK118082

Primary Presenter / email: **Thompson, Andrea** / amwo262@uky.edu  
**Graduate Student**  
**Translational Research/Science**  
**Diabetes/Endocrinology**



# Oral Abstracts

## Session **IM**

Abstract Title: **PAQR4 impacts liver metabolic remodeling by mediating ceramide levels and hepatokine signaling**

Author(s): QZ Zhu, Barnstable Brown Diabetes and Obesity Center, U of Kentucky; SZ Zhao, Sam and Ann Barshop Institute for Longevity and Aging Studies, Department of Medicine and Department of Cellular & Integrative Physiology, UT Health Science Center at San Antonio, TX; JB Funcke, Touchstone Diabetes Center, UT Southwestern Medical Center, Dallas, TX; P.E. Scherer, Touchstone Diabetes Center, UT Southwestern Medical Center, Dallas, TX

**Abstract:** PAQR4, a member of the progestin and adipoQ receptor family (PAQR1-11), is implicated in various cancers, including breast cancer and hepatocellular carcinoma (HCC), yet its metabolic role remains unclear. We recently identified PAQR4 as a key regulator in ceramide metabolism by mediating ceramide synthases (CERS). Here, we reveal its critical role in liver metabolism. Liver PAQR4 is upregulated upon injuries including steatosis, hepatitis, and hepatocellular carcinoma (HCC), and correlates with CERS in HCC-livers. To investigate its liver function, we generated doxycycline (dox)-inducible hepatocyte-specific transgenic (Paqr4-Tg) and knockout (Paqr4-LKO) mice. Paqr4 induction in hepatocytes caused transient weight loss due to reduced food intake, accompanied by hypoglycemia, lower hepatic glycogen, and downregulated gluconeogenic genes (Pck1 and G6pc), indicating impaired hepatic glucose production. Metabolic cage studies revealed a shift toward fat oxidation with lower respiratory exchange ratios. Moreover, Paqr4-Tg mice displayed elevated NEFA levels and enhanced adipose lipolysis. In obese conditions, Paqr4-Tg mice fed a high-fat diet (HFD) exhibited similar weight reduction and hypoglycemia upon dox- induction. In contrast, Paqr4-LKO mice displayed minor effects on systemic metabolic effects despite significant alterations in hepatic carbohydrate and lipid pathways. Consistently, PAQR4 overactivation in hepatocytes caused ceramide accumulation and impaired liver mitochondrial function. Moreover, PAQR4 overactivation increased the circulating levels of hepatokine FGF21 and bile acids, which may mediate liver-adipose crosstalk and enhance adipose lipolysis. These findings establish PAQR4 as a key regulator of liver metabolism by regulating ceramide levels and hepatokine signaling. Further studies are needed to elucidate its role in metabolic-associated steatohepatitis (MASH) and HCC progression.

Supported by: AHA855170; UK College of Medicine Startup funds

Primary Presenter / email: **Zhu, Qingzhang** / qzh251@uky.edu  
**Faculty**  
**Basic Research**  
**Obesity Diabetes**

# Oral Abstracts

## Session **DREAM/SPARK**

Abstract Title: **The Impact of Adverse Childhood Experiences on COVID-19-Related Stress and Mental Health in Emerging Adults**

Author(s): B. Angoma, College of Agriculture Food and Environment, U of Kentucky; F. Sesenu, Department of Behavioral Science, U of Kentucky; E. Littlejohn, Department of Behavioral Science, U of Kentucky; Y. Jiang, Department of Behavioral Science, U of Kentucky.

**Abstract:** Adverse childhood experiences (ACEs) are defined as disruptive and harmful events that are typically chronic in nature taking place within a child's social environment. Literature suggests ACEs may amplify the impact of trauma experienced during the COVID-19 lockdowns. We test the hypothesis: The COVID-19 lockdown serves as a predictive factor in shaping the current mental health outcomes of young adults, amplifying the influence of individual ACEs. Survey data was collected from 81 young adults (aged 18-24) from South Africa (n=39) and the US (n=42) using a Qualtrics cross-sectional survey. Respondents were surveyed on their ACEs, pandemic-induced stress, and mental health outcomes. Preliminary findings show the overall sample (44.3% male and 51.9% female) reported relatively low scores (M = 1.17, SD = 1.43) for total ACE burden (score range, 0-7). However, independent sample t-test indicate that participants in South Africa reported significantly higher ACE scores (M = 1.54, SD = 1.68) compared to those in the United States (M = 0.83, SD = 1.06),  $t(79)=2.28$ ,  $p = .026$ , with a medium effect size ( $d = 0.51$ ). Additionally, a linear regression also showed that ACEs significantly predicted mean negative emotions impacted by COVID-related stressors, showing a weak but positive relationship ( $\beta = 0.14$ ,  $t(79) = 2.81$ ,  $p = .006$ ,  $R^2 = .09$ ). Findings show that exposure to ACE serves as a predictive factor in determining COVID-19-related stressors in emerging adults. Insights underscore the importance of further research to explore the interplay between ACEs and pandemic-related mental health outcomes, particularly among emerging adults.

Supported by: SPARK funding award from UK Center for Health Equity and Engagement & NIH CTSA grant (UL1TR001998)

Primary Presenter / email: **Angoma, Botshelo** / Ban247@uky.edu  
**Undergraduate Student**  
**Health Equity Research**  
**Behavioral Research**

# Oral Abstracts

## Session **DREAM/SPARK**

Abstract Title: **The Relationship Among Perceived Environmental Exposures, Socioeconomic Factors, And Chronic Disease Outcomes**

Author(s): Ketrell McWhorter, Department of Epidemiology and Environmental Health, U of Kentucky;  
Mandy Dickerson, Public Health, U of Kentucky.

**Abstract:** Introduction: Exposure to environmental pollutants and hazardous substances significantly contributes to chronic diseases and exacerbates health disparities. While previous research has established links between environmental pollutants and adverse health effects, gaps remain in understanding how perceptions of environmental health risks influence chronic disease prevalence across demographic groups. Additionally, the role of socioeconomic factors in shaping vulnerability to these exposures remains underexplored.

Methods: A cross-sectional observational study was conducted using 15-minute electronic surveys distributed during community outreach events. The surveys collected data on demographics, perceptions of neighborhood and built environments, chronic health conditions, beliefs about environmental health impacts, stress related to community environments, and levels of awareness regarding community environmental issues. Data analysis was performed using SAS version 9.4.

Results: Among 84 respondents, mean age was 28.9±15.1 years. Most were female (76%), 21% male and 2% non-binary, and 59% identified as non-white. Nearly 60% reported having a chronic condition and 4% reported a cancer diagnosis. Eighty percent believed environmental factors contribute to chronic diseases and 27% expressed concern about neighborhood air quality. Almost 30% felt 'slightly' or 'not at all informed' about their community environment, while nearly half experienced stress related to their community environment 1-2 days per week.

Conclusion: This study highlights the intricate relationship between environmental perceptions, chronic disease outcomes, and socioeconomic factors. Despite moderate awareness of environmental health risks, significant gaps in knowledge persist. Addressing disparities through public health initiatives focused on environmental justice, health literacy, and community engagement is crucial to reducing the burden of chronic disease.

Supported by: SPARK funding award from UK Center for Health Equity and Engagement & NIH CTSA grant (UL1TR001998)

Primary Presenter / email: **Dickerson, Mandy** / mdi260@uky.edu  
**Undergraduate Student**  
**Health Equity Research**  
**Chronic Disease**

# Oral Abstracts

## Session **DREAM/SPARK**

Abstract Title: **A Meta-analysis of Labor Determinants and Sleep Health across the Lifespan**

Author(s): J. R. Silva-Jones, Department of Psychology, University of Kentucky; Z. Woolfolk, Department of Psychology, University of Kentucky; A. Calloway; Abigail Wexner Research Institute at Nationwide Children's Hospital, Columbus, OH; M.A. Davenport, Abigail Wexner Research Institute at Nationwide Children's Hospital, Columbus, OH; L. N. Whitehurst, Department of Psychology, University of Kentucky

**Abstract:** Introduction. Previous work has linked work characteristics (i.e., job stress, shift work) with disturbed sleep. Here, we used a meta-analysis approach to examine the effect of labor determinants in the US on sleep outcomes.

Methods. We conducted keyword combination searches in publicly available databases. We included articles that identified labor determinants such as pay, work schedules, and type of work. Effect sizes were computed as the unbiased standardized mean difference between groups, Hedges g. We conducted fixed-effect analyses to account for our small number of studies.

Results. Ten articles from peer-reviewed journals met the criteria for the meta-analysis. For sleep duration, five of six studies examined adult samples (one study on pregnant women) with an approximate average age of 41years. One study examined the effects of labor on child sleep with an approximate average age of 11years. There was a small mean effect size of -.18, indicating that individuals in industries with less pay, inflexible work schedules, and in manual labor positions report shorter sleep durations than their counterparts. For sleep quality, four articles met criteria and only examined adult samples (average age 52years). We found a moderate mean effect of .54 indicating that individuals with less pay and less schedule control reported better sleep quality than their counterparts.

Conclusion. Findings suggest that labor determinants have differential effects on sleep such that more negative work practices yield shorter sleep durations but better sleep quality which may be tapping into subjective versus theoretical differences of what is considered poor sleep.

Supported by: NIH CTSA grant (UL1TR001998) through the DREAM Scholars Program

Primary Presenter / email: **Silva-Jones, Jillian** / jrsi236@uky.edu  
**Graduate Student**  
**Health Equity Research**  
**Behavioral Research**

# Oral Abstracts

## Session **DREAM/SPARK**

Abstract Title: **A Collaborative Model for Diabetes Education: Connecting RDNs and Promotores de Salud**

Author(s): E. Soria Chiroque, Department of Biology, U of Kentucky; G. Mudd-Martin, College of Nursing, U of Kentucky; J. Plasencia, Department of Dietetics and Human Nutrition, U of Kentucky

**Abstract:** Background: Type 2 diabetes disproportionately affects the Latino population in the United States, with a prevalence of 11.5% among Latinos, significantly higher than the 7.2% seen in non-Hispanic Whites. Given the growing importance of cultural competency in healthcare delivery, calls have been made for an integrated model employing both registered dietitian nutritionists (RDN) and promotores de salud, community health workers with Latino communities (promotores). However, there is a lack of research focusing on the specific training needs of RDNs and promotores in the context of Latino diabetes self-management.

Objective: This study aims to explore what both RDNs and promotores know about each other's roles within the context of type 2 diabetes management among Latino communities as well as potential barriers and facilitators for effective collaboration.

Methods: This study will employ data from an online survey disseminated to RDNs and promotores from Kentucky, Alabama, Georgia, Tennessee, and North Carolina to explore perspectives on the feasibility, perceived effectiveness, and practical challenges of integrating promotores into RDN-led diabetes education efforts.

Results: This study will identify key factors affecting the successful integration of RDNs and promotores in delivering culturally appropriate diabetes self-management education, along with the perceived efficacy of this model in enhancing diabetes outcomes.

Conclusion: Findings may provide insights for a scalable framework for addressing diet-related health disparities and improve diabetes self-management outcomes by integrating promotores into healthcare teams, thus extending the reach of nutrition and diabetes counseling to underserved Latino communities.

Supported by: SPARK funding award from UK Center for Health Equity and Engagement & NIH CTSA grant (UL1TR001998)

Primary Presenter / email: **Soria Chiroque, Eduardo** / eso245@uky.edu  
**Undergraduate Student**  
**Health Equity Research**  
**Nutrition**

# Oral Abstracts

Session **DREAM/SPARK**

Abstract Title: **The Impact of Adultification Bias on Self-Image and Academic Success Among Black Women**

Author(s): K. Washington, Kentucky State University

**Abstract:** Adultification, a societal norm that causes Black children to be perceived and treated as more mature than their peers, can have profound outcomes on the academic success and self-image of Black women in higher education. Black women are often expected to embody strength, resilience, and maturity “beyond their years,” resulting in heightened pressure, stress, and feelings of isolation. These expectations may also influence the support afforded to them by their peers, staff, and faculty, thereby negatively impacting their overall success. Although existing research highlights the consequences of adultification for Black women, there remains gaps in research that address how they navigate, counteract or leverage these effects. This study uses data from an online biographical questionnaire of 48 Black women attending or working at the University of Kentucky, with 15 of these participants subsequently participating in four virtual focus groups. Preliminary findings suggest that Black women find supportive relationships with peers, staff, and faculty to be important coping strategies for managing adultification bias in their academic experiences. Although participants shared negative effects of adultification bias, other participants shared positive perceptions of how adultification bias affected their educational trajectories. Future research could involve designing and evaluating mentoring structures that support Black women in intersecting roles at institutions of higher education (i.e., staff members who also are graduate students).

Supported by: SPARK funding award from UK Center for Health Equity and Engagement & NIH CTSA grant (UL1TR001998)

Primary Presenter / email: **Washington, Keyoncee** / keyoncee.washington@kysu.edu  
**Undergraduate Student**  
**Health Equity Research**

# Oral Abstracts

## Session **DREAM/SPARK**

Abstract Title: **Genetic Risk and Perceived Neighborhood Disorder with Dementia Across Diverse Populations: Results from All of Us**

Author(s): X. Wu, Depart. of Biostatistics, U of Kentucky; J. Zhang, College of Nursing, U of Kentucky; I. Tsuchiya, Depart. of Biostatistics, U of Kentucky; Y. Sang, EVPHA IT, U of Kentucky; K. Z. Aung, Depart. of Biostatistics, U of Kentucky; Y. Katsumata, Depart. of Biostatistics, U of Kentucky; E. L. Abner, Depart. of Epidemiology and Environmental Health, U of Kentucky; P. T. Nelson, Depart. of Pathology, U of Kentucky; D. W. Fardo, Depart. of Biostatistics, U of Kentucky.

**Abstract:** Introduction: Both genetic and social factors contribute to dementia risk. Genetic risk may be modified by social factors, such as neighborhood characteristics. While previous studies have commonly constructed social factor scores by summing item scores, item response theory (IRT) can estimate more precise composite scores by modeling observable items. This study aimed to 1) construct perceived neighborhood disorder (PND) scores using IRT models across diverse populations, and 2) examine their interaction with genetic risk in dementia.

Method: Using All of Us data, we constructed four cohorts (aged 65+ years): non-Hispanic White (NHW), Black/African American (AA), Hispanic, and Asian. We applied the generalized partial credit model to construct PND scores within each cohort using the Perceived Neighborhood Disorder Scale. APOE genotype represents genetic risk. Logistic regression was employed to examine associations with clinically diagnosed dementia/memory impairment, adjusting for age and sex. We applied random sampling to balance sample sizes between cases and controls.

Results: 7~8% of participants reported dementia/memory impairment (Table 1A). PND item scores varied across groups (Table 1B). PND scores were approximately normally distributed (Fig.1A). Crime, drug use, alcohol use, and vandalism were the most informative (Fig.1B). Among NHW participants (-/- or -/ε4), a 1-point PND score increase raised dementia odds by 1.11 and 1.18. In Hispanics, as the 1-point PND score increased, the odds of dementia increased by 1.34, 1.78, and 2.39 (Table 1C).

Conclusion: APOE and PND were jointly associated with dementia risk. Future research should include additional social measures, more genes, dementia subtypes, and larger sample sizes.

Supported by: University of Kentucky CCTS DREAM Scholar Program; the National Institute on Aging (NIA) P01AG078116; Alzheimer's Association & National Association Coordinating Center (NACC) NIAP24-1276268.

Primary Presenter / email: **Wu, Xian / xian.wu@uky.edu**  
**Postdoctoral Scholar/Fellow**  
**Health Equity Research**  
**Alzhiemers'**

# Oral Abstracts

## Session **Informatics-AM**

Abstract Title: **Muscle ultrasound is ideally suited for optimal evaluation of functional recovery after critical illness.**

Author(s): Sanjay Dhar, MD, Department of Internal Medicine, Division of Pulmonary, Critical Care and Sleep; Kirby Mayer, DPT, PhD, Department of Physical Therapy; Yuan Wen, PhD, Department of Physiology, University of Kentucky.

**Abstract:** Evaluating the physical function of critically ill survivors is increasingly recognized as a crucial patient-centered clinical outcome. However, the lack of an objective baseline for patient function complicates the interpretation of post-intensive care unit (ICU) functional assessments. Muscle wasting starts early and progresses rapidly during critical illness, leading to ICU-acquired weakness (ICUAW), which can result in delayed weaning and longer hospital stays. The presence and severity of ICUAW are independent risk factors for survival in the ICU.

CT, MRI, DXA, bioelectrical impedance analysis (BIA), and muscle ultrasound are tools used to examine muscle architecture, characterize muscle atrophy, and assess muscle wasting. While CT and MRI provide precise measurements of muscle cross-sectional area and volume, these imaging methods are labor-intensive and costly, with CT also posing risks related to radiation exposure. DXA utilizes X-ray radiation to distinguish between lean and fat tissue, but its application in ICU settings is limited due to equipment and patient logistics. BIA estimates fat-free mass by measuring body water but is limited by significant fluid shifts in ICU patients.

Ultrasound can evaluate various quantitative and qualitative muscle characteristics that correlate with clinical and functional outcomes. B-mode ultrasound quantitatively measures muscle thickness, cross-sectional area, and mass, while echo intensity, pennation angle, fascicle length, and elastography analysis provide insights into the qualitative health of muscle, identifying issues such as fatty infiltration and myonecrosis. Artificial intelligence model automating lower limb muscle ultrasound analysis has shown excellent consistency with human analysis. Early detection of ICUAW may allow for targeted interventions such as physical therapy, nutrition, and stimulation to prevent further weakness and enhance strength and functional outcomes for patients who survive the ICU.

Supported by: CCTS AIM Alliance Award. PI Mayer and Dhar.

Primary Presenter / email: **Dhar, Sanjay** / [Sdhar@uky.edu](mailto:Sdhar@uky.edu)  
**Faculty**  
**Translational Research/Science**  
**Muscle Biology**



# Oral Abstracts

## Session **Informatics-AM**

Abstract Title: **VAMP8-Dependent Platelet Secretion Drives Aneurysm Progression: Insights from Clinical and Experimental Models**

Author(s): Shayan Mohammadmoradi, Saha Cardiovascular Research Center and Department of Molecular and Cellular Biochemistry, U of Kentucky, Lexington, KY; Elizabeth R. Driehaus, Department of Molecular and Cellular Biochemistry, U of Kentucky, Lexington, KY; Kory Heier, Department of Biostatistics, U of Kentucky, Lexington, KY; Hammodah Alfar, Department of Molecular and Cellular Biochemistry, U of Kentucky, Lexington, KY; Smita Joshi, Department of Biological Sciences, Eastern Kentucky U, Richmond, KY; Kr

**Abstract:** Background and Objective: Platelet activation and cargo secretion influence thrombus formation and vascular remodeling, potentially driving aortic aneurysm progression. However, their precise role remains unclear. This study integrates a retrospective clinical analysis of aspirin therapy with an experimental AngII-induced AAA model to evaluate platelet inhibition and VAMP8-mediated secretion in aneurysm pathogenesis.

Methods and Results: A retrospective study (2010–2023) at the University of Kentucky Healthcare used AI-driven natural language processing (NLP) to extract aortic diameters. Cohort 1 included AAA/TAA patients and matched controls for platelet count evaluation, while Cohort 2 analyzed aneurysm growth in patients with serial imaging. Multivariable regression revealed aspirin use was associated with accelerated AAA progression in females with small aneurysms (<50 mm) but had no significant effect in males or TAA patients. Platelets were lower in aneurysm patients but not thrombocytopenic. In an AngII-infused hypercholesterolemic mouse model, platelets accumulated at sites of elastin degradation. Bulk RNA sequencing of washed platelets and aortic tissue showed transcriptomic changes in ECM regulation, inflammation, and platelet signaling, supporting a "platelet-aorta axis." VAMP8 deficiency impaired platelet secretion, delayed thrombosis, and significantly reduced AAA incidence and rupture. Aortic tissue from VAMP8-deficient mice exhibited decreased expression of genes linked to ECM degradation and inflammation.

Conclusion: These findings reveal a critical role for platelet cargo secretion in aneurysm progression and suggest that VAMP8 inhibition protects against AAA. Aspirin therapy's sex-specific effects highlight the need for tailored antiplatelet strategies in aneurysm management.

Supported by: The authors' research was supported by the National Heart, Lung, and Blood Institute of the National Institutes of Health (R35HL150818). Additional support was provided by the NIH National Center for Advancing Translational Sciences through grant numbers UL1TR000117 and UL1TR001998. The content is solely the responsibility of the authors and does not necessarily represent the official views of the NIH.

Primary Presenter / email: **Mohammadmoradi, Shayan** / smo255@uky.edu  
**Postdoctoral Scholar/Fellow**  
**Translational Research/Science**  
**Cardiovascular**

# Oral Abstracts

## Session **Informatics-AM**

Abstract Title: **Prompting Medical Vision-Language Models to Mitigate Diagnosis Bias by Generating Realistic Dermoscopic Images**

Author(s): N. Munia, Department of Computer Science, U of Kentucky; A. Imran, Department of Computer Science, U of Kentucky

**Abstract:** Artificial Intelligence (AI), specifically deep learning has made significant advancements in skin disease diagnoses. However, a major concern with deep learning-based models is the biased performance across subgroups, particularly regarding sensitive attributes like skin color. Toward mitigating such diagnosis biases, we propose a novel generative AI-based framework, namely Dermatology Diffusion Transformer (DermDiT). DermDiT leverages text prompts generated via large vision-language models and multimodal text-image learning to generate new dermoscopic images. Through an effective prompting, DermDiT can generate realistic synthetic images leading to improved representation of underrepresented groups in highly imbalanced datasets for clinical diagnoses. Extensive experimentation showcases that our innovative prompting in DermDiT provides more insightful representations to generate high-quality and useful dermatology images.

Supported by:

Primary Presenter / email: **Munia, Nusrat** / nusrat.munia@uky.edu  
**Graduate Student**  
**Health Equity Research**  
**Dermatology**

# Oral Abstracts

## Session **Informatics-AM**

Abstract Title: **Probing the Neural Bases of Individual Differences in Reward Sensitivity: Applications of Machine Learning Methods**

Author(s): A. M. Schreiber, Department of Psychiatry, U of Kentucky; M. N. Hallquist, Department of Psychology and Neuroscience, U of North Carolina, Chapel Hill, NC; A. Y. Dombrovski, Department of Psychiatry, U. of Pittsburgh, Pittsburgh, PA

**Abstract:** Blunted reward sensitivity is thought to underlie a cardinal symptom of major depressive disorder: anhedonia. Conversely, personality neuroscience has implicated enhanced reward sensitivity in extraversion. Here, we sought to test whether individual differences in neural sensitivity to rewards -- operationalized as subject-level regional activation estimates ('betas') to rewards -- explain variation in self-reported levels of extraversion. Participants (N = 121) completed an explore-exploit learning task during an fMRI scan. Using ridge regression, we regressed extraversion scores on parcel-level (N = 444 per subject) reward betas. Our ridge regression model effectively recovered extraversion scores in the held-out test data ( $r = 0.22$ ). To clarify what regions drove the model's predictive performance, we conducted a PCA on parcel-level reward betas. The first PC significantly predicted extraversion ( $r = 0.24$ ). Contrasting the prevailing view in clinical neuroscience that individual differences should be encoded in a few key brain regions, this first PC captured a wide swath of the brain -- encompassing regions canonically involved in reward processing, as well as other regions belonging to other networks. Our results highlight two key findings: First, consistent with theoretical accounts, higher levels of extraversion are associated with enhanced neural sensitivity to rewards. Second, the neural signature of this enhanced sensitivity to rewards is far more widespread than previously thought.

Supported by: NIMH T32 MH019986 to AMS; NIMH R01 MH048463 to MNH and AYD

Primary Presenter / email: **Schreiber, Alison** / [alisonmschreiber@uky.edu](mailto:alisonmschreiber@uky.edu)  
**Faculty**  
**Clinical Research**  
**Behavioral Research**

# Oral Abstracts

## Session **Informatics-PM**

Abstract Title: **Advancing Research and Innovation Through AI**

Author(s): E. Collier, Center for Applied AI, U of Kentucky; C. Leach, Center for Applied AI, U of Kentucky;  
S. E. Armstrong, Center for Applied AI, U of Kentucky;

**Abstract:** AI technologies have profound implications in a broad range of areas, from generative discovery in basic sciences, to advancements in healthcare, to the redefining of the way we work and interact with one another. The ability of AI to analyze vast amounts of data, recognize patterns, and make predictions is revolutionizing research methodologies, accelerating scientific discoveries, and improving patient outcomes. The CAAI team guides researchers, doctors, and other collaborators through common AI technical barriers to rapidly turn ideas into prototypes. CAAI develops pipelines, self-service tools, and templated modules for the repeatable and verifiable use of AI across research domains.

In this presentation, CAAI will describe its main capabilities and services, including Data Science/Machine Learning, Multi-Modal Models, and Virtual Agents and Automation, giving a few examples to demonstrate use. Discussion of projects like HeartLens will demonstrate how AI can utilize computer vision to enhance diagnostic accuracy and improve early cardiovascular disease detection. RADOR demonstrates how time series forecasting, a machine learning application, can use EMS response data in tabular form to predict opioid overdoses. The presenters will then give attendees ideas on how to leverage services for their own use cases.

Supported by:

Primary Presenter / email: **Armstrong, Samuel** / sam.armstrong@uky.edu  
**Staff**  
**Translational Research/Science**  
**Informatics**

# Oral Abstracts

## Session **Informatics-PM**

Abstract Title: **The Applicability of Google Lens in Dermatology: A Retrospective Diagnostic Accuracy Study in Over 150 Patients**

Author(s): M.N. Baker, Department of Dermatology, U of Kentucky; C. Slone, Department of Dermatology, U of Kentucky; C. Wilson, Elkhorn Dermatology, Georgetown, KY

**Abstract:** Google Lens recently expanded its artificial intelligence-based image comparison feature to identify skin conditions. Specifically, GL accesses public images across Google to provide a list of up to 8 diagnoses that appear most similar to skin conditions captured in user-provided photos. GL remains understudied in literature, specifically regarding its accuracy in detecting skin cancer. Using official diagnoses provided by visiting a dermatologist and histopathologic confirmation as our gold standard, we aimed to investigate Lens's performance in real-world patients and associations to gender, age, and Fitzpatrick phototype. We recruited all patients whose conditions were pathologically confirmed to be basal cell carcinoma, benign nevus, dysplastic nevus, melanoma, psoriasis, seborrheic keratosis, or squamous cell carcinoma from January 1 to November 30, 2023, at a single-center dermatology clinic. 152 patients were enrolled, which led to 257 images of distinct skin conditions initially available for testing. Lens was 54.0% correct within the first diagnosis, 85.4% correct within the first 3 diagnoses, and 95.1% correct within all diagnoses provided. Unsurprisingly, the sensitivity for all conditions increased and specificity decreased as more Google diagnoses were considered along the top-1, top-3, and top-8 results. However, nearly every diagnosis had a sensitivity greater than 90% when all outputs were considered. This study helps dermatologists provide anticipatory guidance regarding the patient usage of Lens. This can also open the way for increased patient education and quicker access to dermatologic care. On the other hand, Lens can foster misinformation and undue stress if used without confirmation.

Supported by:

Primary Presenter / email: **Baker, Mindy** / [mng227@uky.edu](mailto:mng227@uky.edu)  
**Medical Resident/Fellow**  
**Clinical Research**  
**Dermatology**

# Oral Abstracts

## Session **Informatics-PM**

Abstract Title: **Quality Assessment of AI-Generated Response to Patient-Reported Information Gaps Regarding HPV Oropharyngeal Cancer**

Author(s): P. Bidros, College of Medicine, U of Kentucky; C. Bobo, College of Medicine, U of Kentucky; A. Mahairas, Department of Otolaryngology, U of Kentucky; M. Windon, Department of Otolaryngology, U of Kentucky, Lexington, KY

**Abstract:** Prior work has demonstrated high anxiety and significant knowledge gaps regarding HPV and cancer treatment at diagnosis of HPV-positive oropharyngeal cancer (HPV+OPC), with information seeking behavior including internet searching. Artificial intelligence (AI) models are increasingly accessed by patients; however, the quality and understandability of information is unclear.

Patients diagnosed with HPV+OPC and treated at Markey Cancer Center in Lexington, KY from 06/2021 -12/2023 were contacted by telephone and interviewed to elicit unanswered questions they had at diagnosis. These responses were used to prompt two AIs (Google AI and ChatGPT4). Board-certified head and neck oncologists reviewed the responses using the Quality Assessment of Medical Artificial Intelligence (QAMAI). Flesch Kincaid Reading Ease was applied. Results were compared using a two-tailed t-test ( $p < 0.05$ ).

Eleven HPV+OPC patients completed the telephone interview. The following prompts were generated: "pros and cons getting treatment for hpv throat cancer", "side effects radiation hpv throat cancer", "treatment options hpv throat cancer", "would the vaccine have stopped me from getting hpv throat cancer", "what is hpv", and "how is hpv spread". The reading level was on average college level (55.0) for Google AI responses, whereas for ChatGPT4, it was 10th-12th grade level (44.9). 6 board-certified oncologists completed the survey. Most (5/6) physicians found that the information was over-simplified or misleading, ChatGPT4 scored an average of 13.3/30 (fair quality), and GoogleAI scored an average of 21.8/30 (good quality). The quality was significantly better for Google AI ( $p = 0.019$ ), primarily due to the provision of resources.

AI-generated information regarding HPV+OPC is good, however can provide misinformation, and reading level is too complex for most. As AI models evolve, it is essential that physicians remain the "human in the loop" to advise patients and mediate anxiety and concerns.

Supported by: The project described was supported by the NIH National Center for Advancing Translational Sciences through grant number UL1TR001998. The content is solely the responsibility of the authors and does not necessarily represent the official views of the NIH.

Primary Presenter / email: **Bidros, Patrick** / pcbi224@uky.edu  
**Professional Student (MD, PharmD, Dentistry, PT)**  
**Clinical Research**  
**Cancer**

# Oral Abstracts

## Session **Informatics-PM**

Abstract Title: **Predicting Adverse Effects for Antifibrotic Therapy in Pulmonary Fibrosis using Large Digital Twins.**

Author(s): D. Onishchenko, Biomedical Informatics, U of Kentucky; F. Martinez, Division of Pulmonary, Allergy, and Critical Care, Department of Medicine, University of Massachusetts; I. Chattopadhyay, Biomedical Informatics, U of Kentucky

**Abstract:** Pulmonary Fibrosis is a severe and chronic lung disease characterized by progressive fibrosis of the lung tissue, leading to significant morbidity and mortality with median post-diagnostic survival of approximately 4 years, and no cure. Antifibrotic therapies, such as Pirfenidone and Nintedanib, offer modest benefits in slowing disease progression, but are frequently discontinued due to poor tolerability. Predicting long-term adherence to these therapies at the point-of-diagnosis could improve clinical outcomes by personalizing treatment strategies. Here we present an approach to forecast long-term adherence to antifibrotic therapy, at the point of diagnosis, via inferring a generative digital twin of health trajectories from large administrative databases.

Using  $n=10,000$  patients from the Merative MarketScan database (2014-2022) we inferred a digital twin of longitudinal records of age-stamped ICD-10-CM diagnostic codes. We defined treatment adherence as the absence of documented discontinuation for at least three years after therapy initiation. Using a distinct cohort of  $n=1,631$  PF patients with antifibrotic prescriptions, we then evaluated our ability to make point-of-diagnosis prediction of adherence outcomes.

Predictive performance was evaluated using metrics such as area under the curve (AUC), positive predictive value (PPV), and likelihood ratios. Our digital twin framework achieved out-of-sample AUC of 87.9% (95% CI: 86.6% - 89.3%), with a PPV of 96% at 94% specificity. Patients predicted to adhere to anti-fibrotic therapy at the point of diagnosis, were 13.7 times more likely to tolerate therapy compared to baseline. Our approach significantly reduced the predicted discontinuation rate from 32% to 4%.

Our framework demonstrates clinically actionable precision in predicting antifibrotic therapy adherence. Integrating this tool into clinical workflows could enhance decision-making and optimize outcomes.

Supported by:

Primary Presenter / email: **Chattopadhyay, Ishanu** / [ishanu\\_ch@uky.edu](mailto:ishanu_ch@uky.edu)  
**Faculty**  
**Translational Research/Science**  
**Pulmonary**

# Oral Abstracts

## Session **Informatics-PM**

Abstract Title: **Multi-Omic and Biochemical Profiling of Heart Failure Specimens at the University of Kentucky**

Author(s): A. T. Minton, Departments of Physiology and Internal Medicine, U of Kentucky; A. G. Wellette-Hunsucker, Departments of Physiology and Internal Medicine, U of Kentucky; K. S. Campbell, Departments of Physiology and Internal Medicine, U of Kentucky

**Abstract:** In collaboration with UKHealthCare clinical teams, the Campbell Lab has created a cardiac biobank containing more than 20,000 specimens from 650 human hearts. Procurements include myocardium from cardiovascular procedures (e.g., transplantation) and organ donation.

Nucleic acids were extracted from 350 specimens and sent for whole exome and transcriptome sequencing. The average patient age was 52 years, and dilated cardiomyopathy (DCM) was the most frequent clinical presentation (35%). In failing and donor hearts, 340,944 deleterious genomic variants and 6,485 differentially expressed genes were identified. Deleterious variants in the genes encoding titin (TTN), myosin-binding protein C (MYBPC3), and alpha myosin (MYH6) are found in both groups. Moreover, there is significant overexpression of TTN ( $p < 0.01$ ) and MYH6 ( $p < 0.001$ ) transcripts, unlike MYBPC3 ( $p = 0.85$ ).

In DCM patients with pathogenic TTN variants, relative protein phosphorylation (troponin I [TnI] and myosin-binding protein C [MyBP-C]) and content (collagen and alpha tubulin) were quantified using various biochemical assays. Previous data from our lab displayed hypophosphorylation of TnI and MyBP-C in DCM; however, this study shows that those with pathogenic TTN variants deviate from this trend. Tubulin content trended downward ( $p = 0.12$ ), but collagen content remained comparable to donors ( $p = 0.90$ ).

Further analysis of this data will provide a genetic atlas representing heart failure patients in the greater Bluegrass region. Additional omic and bioanalytical studies are underway to explore the contribution of TTN variants to DCM pathology. Our team is happy to share deidentified samples and clinical data with researchers to help develop better therapies for heart failure patients.

Supported by: NIH awards: R01HL173989, R01HL146676, R01HL149164, and R01HL163977

Primary Presenter / email: **Minton, Austin** / [atmi229@uky.edu](mailto:atmi229@uky.edu)  
**Graduate Student**  
**Translational Research/Science**  
**Cardiovascular**



# Oral Abstracts

## Session **Informatics-PM**

Abstract Title: **Swin-KAT: Advancing Swin Transformer with Kolmogorov-Arnold Network for CT Image Quality Assessment**

Author(s): Kazi Ramisa Rifa, Department of Computer Science, U of Kentucky; Jie Zhang, Department of Radiology, U of Kentucky; Abdullah Al Zubaer Imran, Department of Computer Science, U of Kentucky, Lexington, Kentucky

**Abstract:** Accurate and reliable image quality assessment (IQA) plays a pivotal role in optimizing clinical diagnosis. Most of the existing deep learning models depend on proxy IQA scores of radiologists' assessments and rely on complex architectures demanding significant computational resources. However, proxy scores may not always align well with the diagnostic quality followed by clinicians, and the complex framework limits real-time application and scalability on standard clinical hardware. In this paper, we propose a novel reference-free, automated, and reliable computed tomography (CT) IQA model employing a Kolmogorov-Arnold Network-based transformer framework with an attention mechanism dubbed Swin-KAT. Extensive evaluations demonstrate the effectiveness of the proposed Swin-KAT not only in accurately predicting in-domain radiologists' assessment but also in evaluating out-of-domain clinical images of pediatric CT exams. Furthermore, Swin-KAT is capable of quantifying the quality of approximately 50 CT images per second with minimal memory consumption, outperforming existing CT IQA methods.

Supported by:

Primary Presenter / email: **Rifa, Kazi Ramisa** / ramisa.rifa@uky.edu  
**Graduate Student**  
**Basic Research**  
**Radiology**

# Oral Abstracts

## Session **Informatics-PM**

Abstract Title: **Physician Assistant Student Attitudes Toward the Utilization of AI to Enhance Psychiatry Skill Development**

Author(s): Y. Xia, Department of Physician Assistant Studies, U of Kentucky; C. E. Vanderford, Department of Physician Assistant Studies, U of Kentucky

**Abstract:** Objective: To examine Physician Assistant (PA) student attitudes on the utilization of artificial intelligence (AI) in learning psychiatric diagnoses.

Methods: This study analyzed responses from 50 PA students' responses to five questions within an assignment within a didactic psychiatry course. The questions focused on their experience using ChatGPT for psychiatric clinical skill development, utilizing sentiment analysis (measuring positive, negative, and neutral sentiments) and theme frequency analysis to evaluate the effectiveness of AI-assisted learning in psychiatric education.

Results: A clear pattern of educational growth and increased clinical confidence through the AI-assisted learning experience was shown. Students showed significant improvement in their confidence levels for both diagnosis (Compound: 0.41) and treatment planning (Compound: 0.57), with notably positive sentiment trends across responses. The use of ChatGPT as a learning tool proved largely successful (Compound: 0.59 for positive experiences), despite some technical limitations. Students particularly valued the low-stakes practice environment, which allowed them to develop clinical skills without the pressure of real patient interactions. The high frequency of themes related to patient interaction, symptoms, and diagnostic processes across all questions indicates a strong focus on practical clinical skill development.

Conclusions: Research on the utilization of Artificial intelligence in the classroom suggests that while AI-based practice cannot fully replace real patient interactions, it serves as a valuable supplementary tool for developing foundational clinical skills and building professional confidence in psychiatric care.

Supported by:

Primary Presenter / email: **Xia, Yuyan** / [yuyan.xia@uky.edu](mailto:yuyan.xia@uky.edu)  
**Postdoctoral Scholar/Fellow**  
**Scholarship of Teaching & Learning**  
**Psychiatry**

# Oral Abstracts

## Session **CON**

Abstract Title: **Mothers Perception of Hospital Adherence to the Ten Steps to Successful Breastfeeding Predicts EBF in Latinx Mothers**

Author(s): J. Frapolly, University of Kentucky Nursing Student, P. Withers, University of Kentucky Nursing Student, A. M. Linares, DNS, RN, IBCLC, FAAN, FILCA, University of Kentucky Department of Nursing, Global Specialist of Latin America Initiatives

**Abstract:** Introduction: The Ten Steps to Successful Breastfeeding is a framework to promote sustained exclusive breastfeeding. Assessing how well a hospital adheres to the Ten Steps to Successful Breastfeeding is key to outlining necessary modifications in supporting breastfeeding mothers. This study aimed to evaluate Latinx mothers' perception of how well a hospital adheres to the Ten Steps to Successful Breastfeeding and its influence on exclusive breastfeeding (EBF) rates at hospital discharge.

Methods: Secondary analysis of two longitudinal studies. The combined sample (N=74) of self-identified Latinx pregnant women residing in the US. We modified, translated, and evaluated the reliability of the Questionnaire for the Breastfeeding Mother (QBFM), which was applied to evaluate mothers' perception of how well a hospital adheres to the Ten Steps to Successful Breastfeeding.

Results: The QBFM obtained a standardized KR-20 of 0.77. Mothers who EBF had higher scores of the QBFM than mothers who used formula during hospitalization. For each point that the QBFM score increased, the likelihood that the mother was EBF at discharge increased by 1.30 times. Mothers' breastfeeding knowledge was significantly associated with the intention to exclusively breastfeed.

Conclusion: Mothers' perceptions of how well a hospital adheres to the Ten Steps to Successful Breastfeeding was the only significant variable associated with EBF at discharge. The QBFM Spanish version is a valuable instrument that can be used to obtain measurable outcomes and outlines necessary changes after implementing the Ten Steps to Successful Breastfeeding.

Supported by:

Primary Presenter / email: **Frapolly, Jordyn** / jkfr229@uky.edu  
**Undergraduate Nursing Student**  
**Clinical Research**

# Oral Abstracts

## Session **CON**

Abstract Title: **Family functioning is associated with dietary behaviors in Latino(a) adults at risk for T2D and CVD**

Author(s): N. J. Hawes, College of Nursing, U. of Kentucky; G. Mudd-Martin, College of Nursing, U. of Kentucky; M.K. Rayens, College of Nursing, U. of Kentucky; K. V. Key, College of Nursing, U. of Kentucky

**Abstract:** Background: Family functioning has been associated with health behaviors and may be particularly important in Latino(a) cultures in which family interactions and relationships are central. Associations among family functioning and dietary behaviors in Latinos(as) have not been well studied.

Purpose: To examine associations among family functioning, engagement in healthy eating, and diet quality among Latino(a) adults at-risk for type 2 diabetes (T2D) and cardiovascular disease (CVD).

Methods: This was a secondary analysis of data from 262 Latinos(as) (40.64±9.7yrs, 86.3% female) participating in the Corazón de la Familia study who completed the General Family Functioning scale to measure family functioning (score range 1-4); the Health Promoting Lifestyle Profile-II Nutrition subscale to assess engagement in healthy eating (range 1-4) and the Healthy Eating Index (HEI) calculated from Vioscreen™ questionnaires to assess diet quality (range 0–100). Linear regression analyses were used to assess relationships among family functioning, engagement in healthy eating and diet quality.

Findings: Mean family functioning score was 3.16±0.55. Mean score for engagement in healthy eating was 2.28±0.44 and HEI score was 69.28±9.55. The overall models for family functioning and engagement in healthy eating ( $F[9,214]=2.90$ ,  $p=.003$ ) as well as diet quality ( $F[9,208]=2.55$ ,  $p=.009$ ) were significant. Better family functioning was associated with better engagement in healthy eating ( $\beta=.137$ ,  $p=.011$ ) and diet quality ( $\beta=.207$ ,  $p=.040$ ).

Conclusion: Family functioning is positively associated with engagement in healthy eating and diet quality among Latino(a) adults with T2D and CVD risk. These findings provide evidence for the importance of family functioning to support healthy dietary behaviors.

Supported by: NIH/NINR grant R01NR016262

Primary Presenter / email: **Hawes, Natalie** / nataliejo.hawes@uky.edu  
**PhD Nursing Student**  
**Community Research**

# Oral Abstracts

Session **CON**

Abstract Title: **Primary Nurse Framework: All-Registered Nurse Staff Model in Trauma Surgical and Abdominal Transplant Critical Care Unit**

Author(s): J. Sanders, College of Nursing, U of Kentucky

**Abstract:** Background: Registered Nurses (RNs) are crucial healthcare professionals, providing continuous, direct, high-quality care for complex hospitalized patients. Nursing continues to face significant challenges due to staffing crises across the United States. There is an inverse correlation between nurse staffing levels and patient outcomes; an increase in nurse vacancies can lead to a decline in quality and safety of patient outcomes. The nursing shortage negatively impacts patient care, including medical errors, omission of care, adverse events, morbidity, and mortality rates. With inadequate staffing, nurses experience stress, anxiety, and burnout due to increased workload, greater patient-to-nurse ratios in high-pressure environments; risking nurse turnover and leaving the profession. Increase in preventive patient harm events and nurse turnover causes higher costs for healthcare organizations.

**Purpose:** This prospective quality improvement project is to evaluate the impact of an All-RN staffing model on the quality of patient outcomes and nurse satisfaction.

**Methods:** This is a quality improvement initiative design with a pre-post intervention evaluation. The study is conducted at University of Kentucky Healthcare Level-1 Trauma academic medical center in a 12-bed inpatient adult Trauma/Surgical and Abdominal Transplant Intensive Care Unit (ICU). This study will restructure the current mixed-nursing staffing model of seven RNs and two Nursing Care Technicians (NCTs), to an All-RN staffing model of eight nurses per 12-hour shift.

**Results:** Results pending. Evaluating patient harm events Methicillin-Resistant Staphylococcus Aureus (MRSA), Hospital Acquired Pressure Injury (HAPI), Catheter Associated Urinary Tract Infection (CAUTI), Central-Line Associated Bloodstream Infection (CLABSI), and falls. Evaluating nurse satisfaction with pre-post intervention survey.

Supported by: UK Nursing Research Council, UK College of Nursing Advisor-Dr. Julia Marfell, Committee Member-Dr. Jacob Higgins, Committee Member, Clinical Mentor- Dr. Benjamin Hughes

Primary Presenter / email: **Sanders, Jeanette** / jesand2@uky.edu  
**DNP Nursing Student**  
**Quality improvement**