STUDENT RESEARCH SYMPOSIUM

6th Annual Student Research Symposium

JANUARY 10, 2025

UNIVERSITY OF
South Carolina
School of Medicine Greenville

Embassy Suites at Verdae
670 Verdae Blvd.
Greenville, S.C. 29607

UNIVERSITY OF
South Carolina
School of Medicine Greenville

SYMPOSIUM SCHEDULE

Welcome and Opening Remarks ..... 8:30 AM – 9.00 AM
Main Ballroom

Anna Blenda, PhD
Director of Research Strategy and Operations
University of South Carolina School of Medicine Greenville

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

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

Oral Presentations ..... 9:00 AM – 10:30 AM
Main Ballroom

Coffee Break ..... 10:30 AM – 10:45 AM

Poster Session 1 ..... 10:45 AM – 12:00 PM
Carolina Ballroom

Lunch and Recognition of Student Mentors ..... 12:00 PM – 12:45 PM
Atrium

Poster Session 2 ..... 12:45 PM – 2:00 PM
Carolina Ballroom

Awards Ceremony ..... 2:10 PM – 3:00 PM
Main Ballroom

Adjournment

ORAL PRESENTATION SCHEDULE

9 AM - 10:30 AM | Main Ballroom

Vanessa Bartholomew - Abstract #5
Preliminary Evidence of Effectiveness of Frequency Modulated Tumor Treating Fields in the Treatment of Glioblastoma Multiforme in vitro

Kenan Delbridge - Abstract #88
Assessing Physical Activity Behaviors and Skeletal Muscle Mitochondrial Oxidative Capacity in Patients undergoing Chemotherapy for Breast or Gynecologic Cancer

Katherine Howey - Abstract #82
Harnessing Artificial Intelligence for TNM Staging Extraction from Electronic Health Records: A Note-by-Note Analysis in Prostate Cancer Documentation

Kayla Beth Jernigan - Abstract #94
Addressing low osteoporosis screening rates in postmenopausal females younger than 65 years old

Garrett Kaufman - Abstract #70
Functional roles of afu-182 in azole response and pathobiology of Aspergillus fumigatus

Aahil Merchant - Abstract #117
Isolation and Differentiation of SVF Derived Adipocytes in a Murine Model of Insulin Mediated Pseudoacromegaly

Samantha Morales - Abstract #27
Efficacy and Cost Effectiveness of Trigger Finger Management and its Relation to A1c Levels

Dylan Singhi - Abstract #9
Deleterious Impact of Plasminogen Activator Inhibitor-1 (PAI-1) on Podocyte Morphology and Function

Jack Stomberger - Abstract #26
Balancing Depth and Simplicity: Faculty Experiences with the ScholarRx Digital Learning Platform

Emily Thomas - Abstract #22
Comparative Analysis of Laparoscipic and Robotic Appendectomy: A Multi-Hopsital Retrospective Cohort Study

Abstract #71

Veronica Able-Thomas

Authors
Veronica Able-Thomas, MS; Shaelynn Blixt, DO; Mary Blumer, MD

Affiliations
USC School of Medicine Greenville; Prisma Health, Dept. of Internal Medicine.

Diversity, Equity, Inclusion: Understanding the Patient Experience Through Assessment of Health Literacy and Identification of Patient Preferences When Receiving Health Information

Background/Purpose
Effective communication between healthcare providers and patients is essential for quality care; however, medical terminology and providers' communication methods can often create barriers to patients' understanding of health information. This project aims to address health disparities by assessing health literacy amongst patients at an internal medicine resident clinic and assessing patient preferences when receiving information about their health.

Methods
This research project utilizes the Rapid Assessment of Adult Literacy in Medicine – Short Form (REALM-SF) questionnaire to assess health literacy among patients at an internal medicine resident clinic. Additionally, it utilizes surveys to understand the patient experience and identify patient preferences when receiving information about their health.

Results
When assessing health literacy in this clinic population, 15.8% of patients surveyed had below an 8th grade education level. According to the results of the REALM-SF Questionnaire, 12.5% of patients surveyed will struggle with most patient education materials. Patient surveys indicate a need for improved communication methods between patients and physicians.

Conclusions
Understanding patients' health literacy is important for physicians as it enables effective communication tailored to patients' comprehension levels, thereby fostering informed decision-making about their care. It is essential for physicians to be aware of strategies to improve communication and enhance care for at-risk patient populations. Future studies will include a larger patient sample size to increase reliability of results. Additionally, further studies will address the physician's comfort and knowledge when assessing health literacy and caring for patients with low health literacy. In conclusion, this project aims to address healthcare disparities by improving provider's understanding of health literacy and identifying patient preferences; therefore, strengthening the patient-physician relationship and resulting in more personalized, effective, and equitable healthcare.

Student research funded by
Scholars Fellowship Award

Abstract #118

Chase Abshier

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Partial Fundoplication vs TIF: A Retrospective Review

Background/Purpose
Gastroesophageal reflux disease (GERD) is a chronic disease estimated to affect 18-27% of the United States population. The standard for medical therapy is chronic proton pump inhibitor utilization while surgical intervention consists of multiple techniques. The current literature does not provide a definitive answer as to which technique is optimal, therefore this study comparing outcomes between anterior partial fundoplication, posterior partial fundoplication, and transoral incisionless fundoplication is particularly valuable.

Methods
This is a retrospective review of a prospectively maintained database utilizing quality of life (QoL) surveys to measure pre-operative symptoms as well as postoperative GERD symptoms, dysphagia, and bloating. Inclusion criteria consist of pre-operative QoL survey completion in addition to any 2, 6, or 12 month follow up QoL surveys. 227 patients met the inclusion criteria in the 3 procedures: 101 partial anterior fundoplication, 84 partial posterior fundoplication, and 42 TIF patients.

Results
Each of the three interventions resulted in statistically significant decreases in GERD symptoms at both 2 months and 6 months via QoL survey results (all $P < .001$). However, there was no significant difference in the decrease in GERD symptoms seen among the three interventions (all $P > .05$). Likewise, there was no significant difference in the development of postoperative bloating and dysphagia among the three interventions (all $P > .05$).

Conclusions
Both anterior and posterior fundoplication as well as TIF are appropriate techniques for the reduction of GERD symptoms. Postoperative dysphagia and bloating rates are not deciding factors as to which intervention to utilize.

Student research funded by
Scholars Fellowship Award

Abstract #47

Rachel Adickes

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Clinical Nutrition Collaborative

Background/Purpose
Many overweight and obese Americans face barriers to weight management, including but not limited to lack of knowledge about nutrition, lack of time to exercise, and lack of resources to purchase healthier food options. The purpose of this study was to examine barriers that patients face in weight management and methods to overcome those barriers.

Methods
Patients with a BMI ≥ 27 kg/m2 were screened, and the patients were given an opportunity to volunteer to participate in the nutrition clinic; if patients chose to deny participation, the patients were then asked what barriers the patients faced in participating in the study. The patients that volunteered to participate in the study then worked individually with physicians and graduate students for twelve weeks in order to discuss their specific nutrition goals, what barriers they faced in achieving those goals, and how they could overcome those barriers. The patients were provided physical resources, including the option to attend cooking classes and a box of fresh produce every two weeks. Next, the surveys of the patients who denied participation in the study will be qualitatively studied in order to determine the most common barriers that patients face in achieving weight management. At the end of the twelve week period, the effectiveness of the nutrition clinic will be measured by measuring decreases in weight loss.

Results
It is hypothesized that physicians working closely and individually with overweight and obese patients in order to overcome barriers to adequate nutrition will result in weight loss and increased overall health.

Conclusions
Patients working alongside of physicians to overcome barriers to achieving weight management can leads to greater overall health and improved quality of life.

Student research funded by
Scholars Fellowship Award

Abstract #50

David Arnold

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Exploring the Impact of Genetic Mutations on Treatment Efficacy in Colon Cancer

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

Methods
Clinical and mutation data for 181 colon cancer patients was obtained from Prisma Health Cancer Institute's Biorepository. The Hotspot mutation status of 50 cancer-critical genes was determined through multiplex PCR of the tumor samples by Precision Genetics and USC Functional Genomics Core. Data analysis was performed to assess the frequencies of mutations and patient demographics. Additional analysis is being performed using R software and machine learning to identify relationships between different treatments, mutations, and patient outcomes.

Results
The most frequent mutations in the colon cancer patients were in the genes TP53 (54.1%), KRAS (37.6%), APC (33.7%), KDR (29.8%), and PIK3CA (25.4%). The majority of colon cancer cases were classified as adenocarcinoma (94.0%), with the remaining being mucinous adenocarcinoma (3.8%), mucinous (1.1%), sarcoma (<1%), and spindle cell (<1%). The most prominent cancer stages were IIA (20.8%), IIIB (18.0%), and I (12.6%).

Conclusions
Our preliminary analysis demonstrates the variety of genes mutated in the colon cancer dataset. This also aligns with the frequencies of mutated genes observed in previous studies, reinforcing the dataset's quality and potential for ongoing analysis. As we continue our research, we aim to identify novel correlations between mutated genes, treatments, and patient outcomes in an effort to pave the way for improving therapeutic strategies.

Student research funded by
Scholars Fellowship Award

Abstract #99

Brittany Austin

Authors

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Racial Realities: Breast Cancer Through Different Lenses

Background/Purpose

Racial disparities in cancer outcomes are a pressing national concern that influences patient prognosis. To investigate these disparities, we analyzed breast cancer patients at Prisma Health Cancer Institute, focusing on demographics, molecular characteristics, and lifestyle factors, comparing our findings with national trends.

Methods

Our study analyzed 1,425 breast cancer patient records from the Prisma Health Biorepository (2014-2022), comparing African American (248 or 17.4%) and White (1,177 or 82.6%) women. Statistical analysis using JMP, GraphPad, and Social Statistics software assessed cancer staging, molecular subtypes, and BMI.

Results

More African American women were diagnosed with breast cancer before the age of 40 (5.645%) compared to White women (4.843%). The incidence of triple-negative breast cancer (TNBC) was higher among African American women (10.89%) than White women (7.73%), aligning with national trends that show a greater prevalence of TNBC in African American populations. When comparing body mass index (BMI) across groups, White women had an average BMI of 29.40, slightly above the national average of 29.2, placing them in the overweight category. In contrast, African American women had an average BMI of 32.88, exceeding the national average of 32.2, and categorizing them as obese. Among women with a BMI over 25, 7.71% of White women developed TNBC, compared to 10.37% of African American women, suggesting a greater TNBC risk linked to elevated BMI.

Conclusions

Our study analyzes breast cancer patients at Prisma Health Cancer Institute, highlighting population differences. The Biorepository predominantly contains samples from White patients, not reflecting Upstate South Carolina's racial composition. However, racial composition of breast cancer samples in the Biorepository is comparable with census data. Further investigation of these discrepancies is crucial for developing accurate, representative data. This study aims to inform targeted interventions, enhancing physician-patient interactions and contributing to a more equitable healthcare system and improved patient care outcomes.

Abstract #51

Louise Averitt

Authors

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Affiliations

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Burnout in Medical Students Involved in Community Outreach

Background/Purpose

Medical students experience high rates of burnout while going through their training. Research has demonstrated that community involvement may decrease burnout among medical students. One means of community engagement at the USC School of Medicine Greenville (USCSOMG) is Root Cause, a community health fair led by USCSOMG students in high-need neighborhoods. The aim of this project was to evaluate whether participating in Root Cause impacted the levels of burnout among USCSOMG medical students.

Methods

USCSOMG students volunteering at Root Cause events voluntarily completed the Maslach Burnout Inventory prior to each event. One hundred and five surveys collected from 2022 to 2024 were analyzed using Prism and Excel to determine the relationship between Root Cause attendance and burnout. Statistical tests included Pearson correlations and unpaired t-tests.

Results

No statistically significant correlation was found between Root Cause attendance and burnout during the 2022-2023 academic year. However, in 2023-2024, increased Root Cause attendance correlated with decreased levels of burnout among students ($r = -0.3077$, 95% CI [-0.05608, -0.5226], $p = 0.0177$). Furthermore in 2023-2024, students who completed event surveys at multiple Root Cause events had a lower mean burnout score than students who completed only one event survey (mean difference=-3.783 (95% CI [0.006643, -7.632], $p=0.0540$).

Conclusions

In our study we found that increased community engagement through attendance at Root Cause events could lead to decreased levels of burnout among USCSOMG medical students. This encouraging analysis has led to further expansion of Root Cause and encouragement of student volunteerism. Further study is underway to longitudinally evaluate all first-year medical students' levels of burnout in relation to community involvement. As medical schools grapple with high burnout rates, establishing avenues for community volunteering, such as Root Cause, may prove to be beneficial to student wellness and positively impact future patient care.

Student research funded by
Scholars Fellowship Award

Abstract #5

Vanessa Bartholomew

Authors

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Preliminary Evidence of Effectiveness of Frequency Modulated Tumor Treating Fields in the Treatment of Glioblastoma Multiforme in vitro

Background/Purpose

Glioblastoma Multiforme (GBM) is the most aggressive brain tumor in adults and typically portends a very dismal prognosis. A recent Phase III randomized human trial demonstrated that the addition of Un-Modulated Tumor Treating Fields (UM-TTFields) delivered at 200 kHz improved 5-year survival rates from 5% to 13%. Recently it has been proposed due to the inhomogeneity of cell size and ploidy throughout a tumor that delivering TTFields while modulating the frequency (FM-TTFields) resulted in superior outcomes in comparison to UM-TTFields in triple negative breast cancer cell lines (TNBC). The aim of this project was to investigate whether FM-TTFields would demonstrate a similar superiority over UM-TTFields in the treatment of GBM in vitro as was recently demonstrated in TNBC.

Methods

U-118 cells (ATCC) were exposed to FM-TTFields for 72 hours at an electric field (0.83 Vrms/cm at a frequency ranging from 190 to 210 kHz) which was modulated at a frequency of 21.277 mHz. At the end of 72 hours 3 wells of treated cells and 3 wells of untreated cells were stained with Annexin-FITC and 7-AAD and analyzed for viability and apoptosis by flow cytometry.

Results

The mean concentration of cells exposed to FM-TTFields was reduced when compared to the untreated controls (24.92 cells/_l versus 284.83 cells/_l, p=0.001348); viability at 72 hours of FM-TTFields versus the control was also significantly different (6.60 cells/_l versus 265.61 cells/_l, p=0.0004917).

Conclusions

FM-TTFields resulted in substantially lower concentrations of surviving cells than the 50% benchmark others have demonstrated with UM-TTFields. Further validation is ongoing and will be expanded to include other GBM cell lines.

Student research funded by
Scholars Fellowship Award

Abstract #6

Vanessa Bartholomew

Authors

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Primary leiomyosarcoma of the inferior vena cava: a case series

Background/Purpose

Leiomyosarcomas of the IVC are the most common primary malignancy of the IVC; however, these lesions are extremely rare, slow growing, present late and portend a poor prognosis. Our aim is to investigate the presentation, treatment, and outcomes and propose a new standardized anatomic and surgically relevant schematic based separation of lesions.

Methods

A retrospective evaluation of all IVC leiomyosarcomas at a single institution was completed (2008-2021). A comprehensive literature was also completed.

Results

The median age at diagnosis was 66.5 years (range 39-79); three patients were females and three were males (50%). Notable comorbidities were a history of smoking (33.33%), hypertension (66.67%), and hyperlipidemia (66.67%). Histology was consistent with leiomyosarcoma. The mean tumor size was 8.38 cm (range 3.6-14.5). Tumor location was documented in relation to renal veins: half of the tumors arose inferior to the renal veins (n=3), half were at the level of the renal veins or directly involved the renal vein (n=3). Three lesions were FNCLCC grade 3, and three were FNCLCC grade 2. All patients underwent resection. Surgical techniques were noted. All resections were R1. No notable post-op complications or mortality occurred. Recurrences occurred in 50% of patients (n=3). The mean overall survival time for the entire cohort was 57.5 mo. post operation (range 12-179); for those that succumbed to their disease, mean survival was 36 mo. (range 12-72). To date, 50% of the cohort has survived (mean 79 mo.; range 27-129).

Conclusions

While surgically difficult, radical resection is still the standard of care, with malignancy-free five-year survival rates of approximately 31.4%. Due to the complexity of the surgical technique required, we propose a relevant designation of IVC to centralize the involvement of the renal veins, demarcating the three regions of above the renal veins, at the level of the renal veins, and below the renal veins.

Abstract #35

Anna Bazell

Authors

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Applications of Commercially Available Human Amniotic Membrane (hAM)-Derived Products in Peripheral Nerve Repair: A Current Literature Review

Background/Purpose

Peripheral nerve injuries are a major cause of disability worldwide, often leading to lasting functional deficits. Surgical treatments like primary repair or nerve grafting have limitations, frequently failing to fully restore sensorimotor function. Human amniotic membrane (hAM)-derived products, with their regenerative properties, have emerged as a potential therapeutic option in peripheral nerve repair. This review assesses the applications, benefits, and limitations of these commercially available hAM products in the context of nerve regeneration.

Methods

The systematic review was conducted across PubMed, Google Scholar, Web of Science, Science Direct, and ClinicalTrials databases, covering literature from 2010 to 2024. Sixteen in vivo and clinical studies utilizing hAM products for peripheral nerve repair were identified, providing insight into their efficacy and potential applications in clinical settings.

Results

Two preclinical studies demonstrated that hAM-derived membranes promote nerve regeneration by serving as a biocompatible scaffold when wrapped around damaged nerves. Seven clinical studies on idiopathic compression neuropathies reported that hAM products help reduce perineural scarring and prevent recurrence of symptoms. Additionally, three case-control studies found that hAM wrapping correlated with faster functional recovery in surgical patients undergoing nerve-sparing tumor resections. Furthermore, four prospective clinical trials are currently underway, which aim to provide more definitive evidence regarding the long-term effectiveness of hAM-derived products in peripheral nerve repair.

Conclusions

Commercially available hAM-derived products show great promise in enhancing peripheral nerve repair due to their anti-inflammatory, anti-scarring, and regenerative properties. However, current studies are limited by small sample sizes and a lack of standardized metrics to measure nerve regeneration outcomes. Further research is needed to address these limitations and to better understand the underlying biological mechanisms that contribute to the therapeutic effects of hAM products. Future large-scale clinical trials will be essential to confirm their potential and establish standardized clinical protocols for their use in nerve repair.

Abstract #13

Brionna Bennett

Authors

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Improving the Diagnosis of Infectious Endophthalmitis and Keratitis via Next Generation Sequencing and Rapid NanoString Based Pathogen Detection

Background/Purpose

Infectious endophthalmitis is a serious infection that requires prompt detection and treatment. However, choosing the appropriate treatment is challenging because of diagnostic inaccuracies. Current culture-based diagnostic methods are time consuming and poorly sensitive. Around 60-70% of patients presenting with these infections remain negative by culture. Herein, we used 16S Next Generation Sequencing to determine etiologies of infections associated with culture negative cases.

Methods

Sample population for culture-negative samples of endophthalmitis. Extract and purifiy 500 µL of sample using the ultra-clean QIAamp UCP Pathogen Mini Kit. Before DNA extraction, spike all samples with Zymo Spike-in Control II for in situ quality control. Amplify the V1-V2 regions of the bacterial 16S rRNA gene and construct sequence using the Zymo Quick-16S NGS Library Preparation Kit. Evaluate the quality of the sequenced reads using FastQCv0.11.3 and MultiQCv1.9. Examine reads for adapter contamination and low-quality regions. Trim and filter using Trimmomatic v0.39. Use Kraken2 to detect and identify pathogens. Assign taxonomy using GreenGenes, RDP and SILVA databases. Use Bracken and Mothur to estimate taxa abundances.

Results

122 culture-negative samples collected from endophthalmitis (aqueous and vitreous) were included. 16S Next Generation Sequencing targeting the variable regions 1 and 2 of the 16S rRNA was positive in about one third of the endophthalmitis cases (data analysis for keratitis in progress). All bacteria identified were clinically-relevant species, and most were fastidious organisms that are difficult to grow in laboratory conditions, such as Haemophilus influenzae, and Streptococcus species.

Conclusions

This method appears to be a promising diagnostic approach that could substantially improve the diagnostic yield and help treat vision threatening ocular infections that are commonly treated empirically because of low sensitivity of current diagnostic methods instead of targeted therapy.

Abstract #31

Ellie Bisese

Authors
Ellie Bisese; Caroline Wright; Kyle Jardim; Dr. Kelly Quesnelle

Affiliations
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Sex Differences in Associations Between Various Dietary Interventions and the Prevention and Management of Hypertension

Background/Purpose
Hypertension, an insidious yet prevalent chronic illness, can be effectively managed in patients through targeted dietary interventions that not only lower blood pressure, but transform everyday meals into powerful tools for cardiovascular resilience. Through exploration of sex-based differences in the efficacy of dietary interventions for the prevention of hypertension, sex-specific health strategies have the potential to influence the management of hypertension among males and females.

Methods
To assess the current research on this topic, a systematic review was conducted, synthesizing findings from peer-reviewed articles and clinical studies published between 2014-2024. All studies were screened for relevance using an advanced sex and gender search tool developed by the Sex & Gender Specific Health Task Force and Program team at Texas Tech University. Additions to the search tool yielded a final search of "Hypertension [Title], Nutrition (all fields)" and "Hypertension [Title], Diet (all fields)" which isolated relevant studies for analysis.

Results
These searches yielded 112 articles. Nine articles were identified that demonstrated alignment with the objective of this review. Of the studies used, six cross-sectional studies and one prospective cohort study found significant differences in dietary interventions between males and females and the prevention/management of hypertension. Results included a range of findings, such as increased fiber, whole grains, and legumes having a greater inverse relationship with blood pressure in females than in males. Two prospective cohort studies that focused exclusively on female participants were included due to their significant findings; however, the absence of male participants in these studies limits their generalizability.

Conclusions
Several dietary interventions were significantly linked to reductions in blood pressure that differed between males and females. Further studies are necessary as the potential implications of sex-based differences in the dietary management of hypertension could profoundly affect how providers counsel patients on lifestyle modifications to prevent and manage hypertension.

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1R25LM014335 to Quesnelle (co-PI)

Abstract #59

Sarah Brown

Authors

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The Role of Social Determinants of Health on Patient Outcomes Using Lifestyle Medicine Interventions

Background/Purpose

Lifestyle medicine interventions allow physicians to prevent and manage chronic disease by impacting their patient's daily habits. Social determinants of health (SDOH) are critical factors that influence how patients implement lifestyle changes. Evaluating this relationship will allow physicians to tailor their lifestyle medicine recommendations and maximize health benefits. This study aims to evaluate the impact of SDOH on the effectiveness of Lifestyle Medicine Board-Certified Prisma physician lifestyle interventions, through the identification of patient barriers and the analysis of these lifestyle interventions.

Methods

Using a mixed methods approach, qualitative data were gathered via semi-structured interviews, aimed to evaluate the dimensions of lifestyle medicine interventions including lifestyle medicine education in practice and perceived patient barriers and outcomes. Transcripts were recorded using Microsoft Teams and analyzed using the Dedoose Qualitative Coding Apps. Quantitative data were sourced from Epic, Prisma Health's electronic health records (EHR). Demographic information including race, gender, ethnicity, age, and insurance status were collected. Patient lab outcomes including BMI, triglycerides, HDL, and HbAc were collected to assess the effectiveness of the LM interventions. SDOH such as food insecurity and transportation access were identified to assess patient barriers to implementing LM interventions. Data was obtained on patient medications and referral completion to address potential confounding variables.

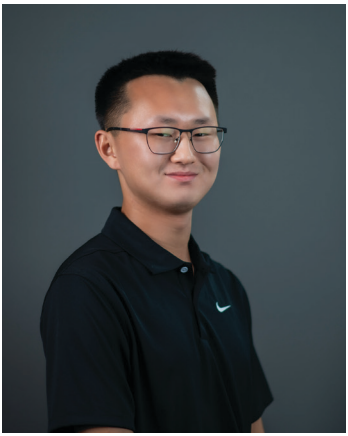
Results

Eight Lifestyle Medicine Board-Certified Prisma Health primary care physicians completed interviews. Data is currently being analyzed in Dedoose to identify SDOH themes. Quantitative data from the EHR is being analyzed with a paired samples t-test. Final results will be completed and analyzed by January 2025.

Conclusions

SDOH play a significant role that may affect patients' ability to reap the benefits of lifestyle medicine interventions. The information gathered will be used to provide insight for LM physicians working with patients with different SDOH backgrounds in order to illuminate how LM interventions can be successful for these populations.

Student research funded by
Scholars Fellowship Award



Abstract #121

David Bu

Authors
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Time to Discontinuation of AEDs when started for AWS

Background/Purpose
Previous research suggests that anti-epileptic drugs (AEDs) are beneficial for the treatment of alcohol withdrawal syndrome (AWS). However, no previous studies have investigated when these medications should be discontinued. This study investigated how seizure incidence compares among patients admitted for AWS and initiated on AEDs for less than and greater than two weeks.

Methods
This will be a retrospective cohort study. The dates of AED initiation and discontinuation, along with seizure presence or absence six months following initiation will be extracted via EPIC chart review. The incidence rate, P value, and risk ratio between the two groups will be calculated.

Results
This is a work in progress and will be updated when results are obtained.

Conclusions
This study will explore an unknown area of AWS treatment and will provide a foundation for further studies. Additionally, this may assist in the development of specific guidelines that include discontinuation time for AED use in AWS.

Student research funded by
Scholars Fellowship Award

Abstract #11

Rowan Burns

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Decreasing 72-hour Readmissions in Sepsis and Pyelonephritis Patients

Background/Purpose
This study aims to evaluate the effectiveness of a targeted intervention to decrease 72-hour hospital readmission rates in patients with sepsis or pyelonephritis in a large southern emergency Dept. (ED).

Methods
This IRB-approved retrospective cohort study evaluated ED readmission rates before and after intervention implementation from January 1 2020 to June 31 2023. The policy was implemented on April 1 2021. Eligible adults (18+) had an ED diagnosis of sepsis or pyelonephritis. Monthly readmission rates were calculated as the proportion of patients readmitted within 72 hours of discharge relative to total number of visits. Pearson's chi-square, Fisher's exact, and Wilcoxon rank-sum tests were utilized to examine differences in the distribution of sociodemographic and clinical variables by 72-hour readmissions status. Interrupted time series (ITS) was used to assess differences in monthly readmission rates pre-policy, during policy implementation, and post-policy.

Results
There were 32,162 patients identified with sepsis or other bacterial infections with 1,621 (5.04%) readmissions within 72 hours. The readmitted group was significantly younger (median age: 52 vs. 57 years), had a higher proportion of White individuals (80% vs. 76%), more self or other insurance types (21% vs. 17%) and higher smoking rates (60% vs. 56%). There were fewer emergent cases (14% vs. 22%) and more urgent cases (66% vs. 62%) compared to those not readmitted. From January 2020 to April 2021, the readmission rate showed a non-significant increase of 0.001 readmissions per admission per month (p=0.07). After policy implementation, an immediate drop in monthly readmission rates of 0.006 was observed, though it was not statistically significant (p=0.29). From May 2021 onwards, a significant decrease of 0.0007 readmissions per admission per month was observed post-intervention (p=0.006). Despite the small magnitude of change, the reversal in the trend direction for 72-hour readmission rates indicates the intervention had a meaningful impact on readmission rates.

Conclusions
Despite the small magnitude of change, the reversal in the trend direction for 72-hour readmission rates indicates that the intervention had a meaningful impact on readmission rates.

Student research funded by
Scholars Fellowship Award

Abstract #105

Victoria Callicott

Authors

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Prehospital Buprenorphine Programs in the United States: A Scoping Review

Background/Purpose

Prehospital buprenorphine administration programs (PBAPs) have proliferated across the United States. Each program follows distinct protocols and success metrics, yet they share the common goal of delivering immediate and follow-up care to opioid overdose patients. Limited information on the availability, protocols, and implementation factors of PBAPs presents challenges for nationwide adoption. This scoping review aimed to identify PBAP locations, common features, effectiveness measures, and research gaps.

Methods

Four databases were used to identify PBAPs from academic manuscripts, media, and conferences up to July 15, 2024. The included programs involved EMS clinicians administering buprenorphine, while those only offering prescriptions were excluded. State EMS offices were contacted, and after three failed attempts, the National Association of Emergency Medical Services Physicians (NAEMSP) listserv was used to query remaining state physicians. Data from manuscripts, news articles, and conferences provided information on PBAP locations, personnel, partnerships, protocols, and outcome measures.

Results

Peer-reviewed sources included three case reports and three cohort studies, identifying thirteen unique PBAPs. Buprenorphine was administered by community paramedics (53.8%), 9-1-1 paramedics (38.5%), or both (7.7%). Administration occurred following naloxone reversal (69.2%) or as follow-up after EMS overdose response (46.2%). Five PBAPs administered 16-24 mg of buprenorphine, and five reported at least one clinical outcome, such as treatment engagement within 7 or 30 days (4), treatment referral (3), transport refusal (2), same-day treatment (1), repeated overdose within 180 days (1), and repeated ED encounter within 180 days (1).

Conclusions

One-third of the United States has implemented a PBAP. However, limited data and a lack of protocol and outcome standardization make comparisons difficult. Further studies on PBAPs' impact on treatment engagement and retention are essential to support these models.

Abstract #112

Sabrina Carrel

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USCSOMG

Research Ready: Meeting Student Needs at USCSOMG

Background/Purpose
Medical student interest in research has increased since USMLE Step 1 became pass/fail. USCSOMG's recently developed Student Opportunities for Academic Achievement Through Research Program in Greenville (SOARinG) program offers a structured research elective during the summer between M1 and M2 years. SOARinG's impact on students' research skills is not yet understood. To evaluate how SOARinG contributed to students' professional development, we measured students' reported experience and self-perceived research expertise before and after SOARinG 2023. Our results will support future refinement and development of the research curriculum at USCSOMG.

Methods
We developed a qualitative REDCap survey to examine students' research skills, experience and confidence before and after 2023 SOARinG participation. Pre- and post-survey responses were compared with chi-squared tests or Fisher's exact test as appropriate.

Results
33 USCSOMG students responded to both the pre- and post-survey, though the frequency of answers to each optional question varied. The number of students who had written a research abstract increased significantly after SOARinG (48.5% pre, 21.2% post, p=0.02). More students had presented at a conference after SOARing (39.4% pre, 69.7% post, p=0.013). Further, more students were familiar with REDCap after SOARing (n=32: 40.6% didn't know what REDCap was pre-SOARing vs 12.1% post) and most students were able to independently use REDCap after SOARinG (n=32: 9.4% pre, 24.2% post). REDCap familiarity and proficiency increased overall after SOARinG (Likert scale, p=0.033). Similarly, students reported feeling more proficient using the Electronic Medical Record (EMR) afer SOARinG (n=33: 33.3% proficient pre, 60.% post, Likert scale, p=0.027).

Conclusions
The survey results of the SOARinG impact showed encouraging changes in students' experiences and confidence before and after the event. Students gained valuable skills in research that will support longitudinal professional development and competitive residency applications. Future work will compare within-year responses in more detail and will compare responses across years.

Abstract #34

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Patient Education and Preferences on A1C Testing: POC vs Venipuncture

Background/Purpose

HbA1C is a blood test that measures glycated hemoglobin for the diagnosis and management of diabetes mellitus. The test can be performed by traditional venipuncture method, or it can be performed as point-of-care (POC) via capillary blood draw. POC can be done in the primary care clinic during an appointment via finger-prick, with immediate results. Venipuncture is performed at an outpatient lab by a phlebotomist at the antecubital or hand site, and results may take 1-3 days. The goal of this research is to determine patient understanding of the test's significance and if they have a preference between the two methods of testing.

Methods

Survey questions were written and reviewed in REDCap. Questions are a mix of multiple choice responses and free-response. Patients that were eligible for the survey were seen by the internal medicine clinic at Prisma, had diagnosed diabetes mellitus, and had previously received both POC and lab methods of A1C testing. The survey was then distributed to patients either in-clinic or via phone call. Patients were verbally questioned and their responses were written by the surveyor. The desired number of surveys is 50-100, and is currently at 40. After the survey collection is complete, survey responses will be analyzed for trends.

Results

Survey results are expected to gauge patient's understanding of A1C testing, and their preferences on testing and why. Preliminary results show that most patients have little to no understanding of A1C significance, and prefer venipuncture testing due to the compassion and efficiency of phlebotomists at the lab. Additionally, many patients find a finger prick to be more painful than venipuncture.

Conclusions

Survey responses thus far indicate a need for more patient education during every follow up with easily understood layman's terms, and to use lab venipuncture methods for A1C tests when immediate results are not needed.

Student research funded by
Scholars Fellowship Award

Abstract #126

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Hybrid Academic/Community Cellular Therapy (CT) Program, Adverse Events and Outcomes Post CAR-T in Hematological Malignancies Including Outpatient Experience: A Retrospective Chart Review

Background/Purpose

CAR-T therapy is a recent development in the treatment of hematological malignancies. There is a need to increase knowledge regarding patient safety related to therapy and its adverse effects (AEs), like cytokine release syndrome (CRS) and immune-effector cell-mediated neurotoxicity syndrome (ICANS), especially from the community setting. As more therapies move to the outpatient setting, there is a need to understand if trends can predict the incidence of these toxicities and their impact on disease outcomes. The purpose is to contribute to existing knowledge about patient AEs and clinical outcomes related to CAR-T therapy at a single academic/community institution's CT program.

Methods

A retrospective secondary data analysis will be performed. AEs to treatment, trends in laboratory results, treatment response, and clinical outcomes/survival rates at different time points are of interest. Statistical analyses will evaluate trends of adverse reactions and outcomes, including descriptive statistics and logistic regressions.

Results

In the preliminary assessment of data, 47 relapsed/refractory patients received CAR-T therapy at Prisma Health's CT program, 72% were infused outpatient; 28% inpatient. There were 47% of patients diagnosed with diffuse large B-cell lymphoma, 40% multiple myeloma, 9% mantle cell lymphoma, 2% acute lymphoblastic leukemia, and 2% follicular lymphoma. Only 2% of patients experienced a grade IV CRS toxicity within the first 30-days of treatment, 60% of patients experienced a grade I or II as their highest CRS toxicity, 0% had grade III CRS toxicity. 11% of patients experienced a grade IV ICANS, 2% grade III, and 15% grade I or II. At 100 days, 38% of patients achieved a complete response; 21% very good partial response; 17% progressive disease; and 9% deceased. Data collection is ongoing.

Conclusions

Ongoing data collection/analysis allows the program to evaluate quality of patient care and safety and will add to the real-world knowledge of trends of clinical outcomes in CAR-T treatment.

Student research funded by
Scholars Fellowship Award

Abstract #110

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Prevena Negative Pressure Wound Therapy on Surgical Site Occurrences Following Open Femoral Access in Vascular Surgery

Background/Purpose

Femoral revascularization procedures in vascular surgery are noted to have a higher incidence of surgical site infections (SSIs) and surgical site occurrences (SSOs). Recently, negative pressure wound therapies (NPWT), such as Prevena, have shown benefits in post-operative surgical site care in improving patient outcomes. This study investigates whether Prevena NPWT on femoral wounds reduces the risk of developing surgical site occurrences.

Methods

A single-center retrospective chart review was conducted on 820 patients who underwent vascular surgery with open femoral access from 2018 to 2024. Patients over 18 with no active infection at the time of operation were included in the study. SSOs were defined as SSIs (superficial and deep), hematomas, seromas, pseudoaneurysms, and other related outcomes. Bivariate analyses were conducted using the Chi-square test for categorical data and the student's t-test for continuous data. Logistic regression analysis identified independent factors associated with SSOs, using variables with p-values <0.10 in bivariate analyses for inclusion. A p-value of <0.05 indicated statistical significance.

Results

White race (OR=1.72, p=0.037), femoral endarterectomy procedure (OR=1.70, p=0.017), and the use of layered staple closure technique (OR=1.77, p=0.003) were independently associated with an increased risk of SSOs. NPWT did not show a statistically significant association with reduced SSOs after adjustment (OR=1.27, p=0.233).

Conclusions

White race, femoral endarterectomy, and layered staple closure were associated with an increased risk of SSO following open femoral access in vascular surgeries. The use of NPWT was not independently associated with a reduction in SSOs. These findings suggest the need for improvements in vascular surgery with targeted interventions in certain demographics and closure techniques to reduce the occurrence of SSOs.

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Abstract #76

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Cultural Humility in Action: Clinician Strategies for Approaching Lifestyle Medicine Interventions Across Cultural Barriers

Background/Purpose

As chronic disease and their associated comorbidities increase, Lifestyle Medicine (LM) poses an opportunity to prevent, treat, and reverse these conditions. However, few studies have elucidated the incorporation of LM into practice. This study aims to measure the effectiveness of LM interventions and explore the facilitators and barriers to implementing LM within a modern health system. Lifestyle Medicine physicians may face additional challenges in treating patients from diverse cultural backgrounds. This substudy will explore the reported challenges and strategies for successfully treating such patients using LM interventions.

Methods

Board-certified LM physicians in Internal Medicine, Family Medicine, and Pediatrics at Prisma Health completed a semi-structured interview on Microsoft Teams regarding methods, facilitators, and barriers to the methods of employing LM practices in the primary care setting. Using the interview transcripts, Dedoose Qualitative Coding App was used to identify overall themes. This sub-study focuses on themes regarding cultural humility in LM interventions.

Results

Eight physicians completed interviews. Data is still being analyzed in Dedoose to identify themes. The following themes are being explored: 1 - Approach (Acknowledging the nuance and difficulty of this situation, Taking time to understand the patient's background and culture, Open-mindedness, respect, and curiosity); 2 – Barriers (Language, Cultural stigmas, Mental health and trauma, Social determinants of health, Adapting recommendations to a different culture); 3 – Facilitators (Adapting recommendations to a different culture, Language services, Screening forms to understand cultural barriers, living environment, current practices, PASOS program, Handouts and education resources for specific populations, Negotiating).

Conclusions

The information gathered will be used to provide insight into the experiences of physicians implementing LM into their practice across patients from different cultural backgrounds in order to illuminate how LM interventions can be successful for these populations.

Abstract #88

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Assessing Physical Activity Behaviors and Skeletal Muscle Mitochondrial Oxidative Capacity in Patients undergoing Chemotherapy for Breast or Gynecologic Cancer

Background/Purpose

Chemotherapy for breast and gynecologic cancer often induces mitochondrial dysfunction, impairing energy production and increasing oxidative stress. This reduces ATP generation, directly diminishing muscle endurance and resilience. Consequently, patients experience fatigue and decreased physical function, highlighting the need for interventions to restore mitochondrial integrity and support recovery. The study's purpose is to determine if physical activity (PA) behaviors at baseline and throughout chemotherapy treatment attenuates mitochondrial dysfunction and increases resistance to chemotherapy-induced fatigue.

Methods

Patient PA behaviors are documented at baseline and each session through a physical activity recall (PAR) questionnaire. The PAR allows the patient to list moderate-to-vigorous physical activity and interval training since their last chemotherapy infusion. Near infrared spectroscopy (NIRS) allows for non-invasive assessment of mitochondrial oxygenation capacity and is measured during exercise and rest periods (on/off kinetics),by assessing changes in oxygenated/deoxygenated hemoglobin. This study applies a generalized linear mixed model (GLMM) with gamma distribution and log link function to evaluate the effect of cycle number on average tau, as well as PA behavior, accounting for individual variability across subjects.

Results

This study is ongoing, and n=23 patients have completed testing. The model revealed a significant positive association between cycle number and average tau (Estimate = 0.1017, $p < 0.001$), suggesting that average time to recovery increases with each cycle. Results also suggest that patients with high PA behaviors may have lower tau values, indicating faster muscle recovery and less mitochondrial dysfunction. This data suggests that likelihood of vigorous PA participation significantly decreases over time (estimate = -0.3103, $p = 0.0395$).

Conclusions

More data is being collected to increase sample size to provide enough power to detect potential correlations. The results of this study may provide insight into how PA behavior before and during treatment correlates with chemotherapy-induced fatigue and mitochondrial dysfunction throughout chemotherapy treatment.

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Abstract #53

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Quantifying Plastic and Reconstructive Surgery Engagement in the Evolution of ICD-10 Codes

Background/Purpose

ICD-10 code specificity is important for detailed diagnostic documentation. Insufficient coding granularity in plastic surgery hinders accurate clinical documentation, impacting education, research, and patient care. This study examines ICD-10 code modification efforts by plastic surgeons and plastic surgery organizations within the last decade, detailing the proposal process and highlighting areas where coding modifications may be explored.

Methods

A retrospective review of all proposals presented to the ICD Coordination and Maintenance Committee from March 2013 to March 2023 was conducted using records from the CDC National Center for Health Statistics. The proportion and timing of successful implementation of plastic surgery-related proposals were evaluated using CMC-provided ICD conversion tables and compared with other surgical specialties using Fisher's exact tests and two-tailed t-tests.

Conclusions

Though few plastic surgeons have taken advantage of the ICD code revision process within the last decade, the success rate for surgical related proposals suggests that this is a feasible method for plastic surgeons and PRS organizations to bring about coding changes that meaningfully impact clinical practice. There are still opportunities for improvement in ICD coding. For instance, the current ICD-10 system fails to classify the spectrum of morphologic severity, laterality, and asymmetry in cases of bilateral cleft lip/alveolus. Plastic surgery practice is known for precision, complexity, and accuracy; ICD codes for plastic surgeons should reflect the same level of detail to improve practice, research, and educational efforts.

Abstract #3

Rachel Donaldson

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Non-Occlusive Airway Balloon Dilator Analysis in the Treatment of Laryngotracheal Stenosis

Background/Purpose
Laryngotracheal stenosis is the narrowing of the airway between the trachea and larynx caused by chronic inflammation or scarring. Treatment options for the condition vary depending on the severity of the stenosis with endotracheal balloon dilation of the stenosis airway becoming a popular option. However, dilation of the airway balloon involves removing supplemental oxygen sources and occluding the airway. Recently, studies have shown promising results from the use of non-occlusive airway balloon dilators for treatment of laryngotracheal stenosis. Our study seeks to analyze if non-occlusive airway balloon dilators provided better intraoperative outcomes during laryngotracheal stenosis repair when compared to occlusive airway balloon dilator?

Methods
This study is a non-randomized retrospective observational cohort study aimed to evaluate intraoperative outcomes of patients treated for laryngotracheal stenosis with either a non-occlusive airway balloon dilator or an occlusive airway balloon dilator. Measurable outcomes include intraoperative medications, oxygen saturation, procedure duration, and types of oxygenation devices used. These are patients of Greenville ENT and Prisma Health who underwent endoscopic repair for laryngotracheal stenosis using airway balloon dilation (occlusive and non-occlusive airway balloon dilators).

Results
Non-occlusive airway balloon dilators used during endoscopic repair of laryngotracheal stenosis will have better intraoperative outcomes when compared to occlusive airway balloon dilators, which will be demonstrated by reduced oxygen desaturation, administration of intraoperative medications, and administration of minimally invasive airway devices.

Conclusions
The outcomes from this study will benefit future patients by providing insight into whether non-occlusive or occlusive airway balloon dilators provided better intraoperative outcomes for patients being treated for laryngotracheal stenosis. These findings may reduce procedure length, limit exposure to unnecessary medications, and prevent medical complications associated with prolonged apneic episodes during airway balloon dilation.

Abstract #33

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ED Utilization in a Primary Care Clinic

Background/Purpose
In recent years, emergency Dept.s (ED) have become increasingly overburdened with non-emergent patient visits, leading to a number of undesired outcomes. Factors such as overcrowding and longer wait-times have contributed to a notable increase in the overall stress and dissatisfaction of both patients and healthcare providers. The current project was designed and conducted with the purpose of (1) establishing a better understanding of the decision making behind ED utilization among high ED users within the Prisma Health Internal Medicine Clinic (PH-IMC) patient population and (2) developing interventional tools that educate patients on alternative resources available at PH-IMC.

Methods
High ED utilizers among PH-IMC patients were identified as individuals who, within a 2-year time period, completed 3 or more ED visits resulting in discharge rather than inpatient admission. A targeted patient survey was prepared and later conducted among these patients via phone calls in order to gather information on barriers to treatment, such as transportation or financial burden. We also inquired about past medical experiences and their awareness of alternative PH-IMC resources like the same-day sick visits and the 24-hour triage line. This data was coded into RedCap and will be further assessed and analyzed for trends that help establish a better understanding behind the preferential use of ED services among this patient population.

Results
This project is currently in the data collection phase; the expected result is the identification of an overall lack of awareness of the PH-IMC resources among high ED utilizers.

Conclusions
Guided by survey data, this project will allow for the development of resources that will potentially lead to decreasing rates of ED utilization among the PH-IMC patient population. With this also comes broader insight into relevant social determinants of health, of which can subsequently be used to inform better methods of addressing patient barriers and improving access to care.

Student research funded by
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Abstract #83

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Preliminary Evidence of Effectiveness of Frequency Modulated Tumor Treating Fields in the Treatment of Glioblastoma Multiforme in vitro

Background/Purpose
Glioblastoma Multiforme (GBM) is the most aggressive brain tumor in adults with very low 2 and 5 year survival rates. A recent Phase III randomized human trial demonstrated that the addition of Un-Modulated Tumor Treating Fields (UM-TTFields) delivered at 200 kHz improved 5-year survival rates from 5% to 13%. Recently it has been proposed due to the heterogeneity of tumor burden that delivering TTFields while modulating the frequency (FM-TTFields) resulted in superior outcomes in comparison to UM-TTFields in triple negative breast cancer cell lines (TNBC). The aim of this project was to investigate whether FM-TTFields would demonstrate a similar superiority over UM-TTFields in the treatment of GBM in vitro as was recently demonstrated in TNBC.

Methods
U-118 cells (ATCC) were exposed to FM-TTFields for 72 hours at an electric field (0.83 Vrms/cm at a frequency ranging from 190 to 210 kHz) which was modulated at a frequency of 21.277 mHz. At the end of 72 hours 3 wells of treated cells and 3 wells of untreated cells were stained with Annexin-FITC and 7-AAD and analyzed for viability and apoptosis by flow cytometry.

Results
The mean concentration of cells exposed to FM-TTFields was reduced when compared to the untreated controls (24.92 cells/_l versus 284.83 cells/_l, p=0.001348); viability at 72 hours of FM-TTFields versus the control was also significantly different (6.60 cells/_l versus 265.61 cells/_l, p=0.0004917).

Conclusions
FM-TTFields resulted in drastically lower concentrations of surviving cells than the benchmarks demonstrated with UM-TTFields. Further validation is ongoing and will be expanded to include other GBM cell lines.

Student research funded by
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Abstract #85

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Clinical Correlations of Vectors of Neoplastic Spread in Patients with Pituitary Adenoma

Background/Purpose

Pituitary Adenomas (PA) are increasingly prevalent benign tumors that can cause significant clinical symptoms due to abnormal hormone secretion and local compression effects, often necessitating surgical resection. However, gross total resection (GTR) is achieved in only about 30% of cases, and recurrence rates can reach up to 50%. This retrospective study examines 69 consecutive transsphenoidal resections to assess the relationship between PA size, anatomical vectors of spread, and surgical outcomes.

Methods

Patients that were included in this study met the following criteria: a pre and post-operative gadolinium T2 weighted MRI (with sagittal, coronal and axial views), the post-operative MRI must have been obtained at least 3 months after surgery and pathologic confirmation of a PA. Patients for whom complete medical information was unavailable were excluded. Standard demographic, clinicopathologic and radiographic measures, to include pre- and post-operative volume measurements, volume and resection percentage calculations were evaluated. Additionally, each MRI was systematically analyzed for tumor extensions along six recognizable anatomical vectors: cavernous sinus, planum, dorsum sella, suprasellar and juxtasellar. Results are reported as group averages with percentage of group total.

Results

The most common pre-operative vector extensions were suprasellar and cavernous sinus. Planum was the least common vector extension. This vector was also the only tumor extension to not significantly correlate with other vectors. Dorsum sella extension indicated a higher likelihood of suprasellar extension. Suprasellar extension significantly correlated with the most vectors, indicating an increased likelihood of dorsum sella, juxtasellar and cavernous sinus extension. Both juxtasellar and cavernous sinus vectors significantly correlated with each other and suprasellar extensions.

Conclusions

Surgeons should now be better informed regarding which specific tumor characteristics represent significant increases in resection difficulty and corresponding post-operative complications.

Student research funded by
Scholars Fellowship Award

Abstract #7

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Radial Scars: To Excise or Not to Excise

Background/Purpose
Radial scars (RS) are benign breast lesions that are often incidentally detected during mammograms and are typically clinically occult. The etiology of RS remains unclear, with potential contributing factors including fibrocystic changes and injury leading to fibrosis and elastosis. The increased detection of RS, partly due to advancements in imaging technology, has raised controversy regarding their differential diagnosis and management, as RS can mimic malignancies on imaging.

Methods
This study conducted a retrospective analysis to examine the incidence of RS, the outcomes of excision versus non-excision, and follow-up outcomes, such as the cancer upgrade rate. The aim was to assess the necessity of excision for RS without atypia when detected on imaging and core needle biopsy.

Results
Our findings revealed an overall upgrade rate of 21.5%. No specific demographic factors, imaging characteristics, or biopsy modalities were significant predictors of upgrade risk.

Conclusions
Our results suggest a more conservative management approach for RS without atypia, recommending excision to prevent potential malignant transformation, as none of the patients in our cohort experienced recurrence after excision. Further research with larger cohorts and longer follow-up periods is needed to refine management guidelines for RS and to identify reliable predictors for progression to malignancy.

Student research funded by
Scholars Fellowship Award

Abstract #2

Emily Duckworth

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Breast Reduction as a Catalyst for Positive Lifestyle Change: A Retrospective Survey Analysis

Background/Purpose

This investigation aims to gain a more comprehensive understanding of the lifestyle changes in patients following bilateral breast reduction (BBR) surgery.

Methods

A retrospective survey was completed by 135 women who underwent BBR between 2016-2024 by a single surgeon. The survey assessed demographics, surgical motivations, exercise, dietary habits, and changes in diagnosed medical conditions and substance use postoperatively. Data was also gathered on resection weight and address. Area Deprivation Index and Social Vulnerability Index analyses were run to determine if geography impacted propensity to experience positive outcomes from BBR.

Results

Conclusions

Approximately 86.7% of participants reported feeling healthier post-surgery, with notable improvements in physical activity (72.6%), diet (51.3%), weight loss (55.6%), and mental health (76.9%). QoL scores increased from 5.3 to 7.8 out of 10. Exercise frequency increased, particularly in high-impact activities. Thirty-six percent of patients intentionally changed their diet. There was no association between resection weight on QoL, body image satisfaction, or weight loss, but higher resection weight was associated with an increase in exercise. Changes in QoL and exercise are similar across different levels of social vulnerability, but "High Vulnerability" individuals experienced a mean weight change of -8.88%, while "Low Vulnerability" patients experienced -2.32% change. BBR encourages positive lifestyle changes, such as increased physical activity and healthier diet. There is no relationship between resection weight and amount of symptom relief experienced after BBR. Individuals living in greater ADI and SVI areas experience increased weight reduction after BBR.

Student research funded by
Scholars Fellowship Award

Abstract #62

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A case of concurrent Immune Checkpoint Inhibitor Associated Necrotizing Myopathy and Acute Inflammatory Demyelinating Polyneuropathy associated with Pembrolizumab therapy for Metastatic Renal Cell Carcinoma

Background/Purpose

Pembrolizumab is a PD-1 inhibitor indicated for a variety of malignancies, including advanced melanoma, head and neck squamous carcinoma, and renal cell carcinoma. Previously reported neurologic and musculoskeletal immune-related adverse events (IrAEs) linked to PD-1 inhibitors include immune checkpoint inhibitor-associated necrotizing myopathy (ICIAM), polymyositis, and acute inflammatory demyelinating polyneuropathy (AIDP). We report a case of concurrent ICIAM and AIDP in association with pembrolizumab.

Methods

A 71-year-old female with a past medical history of metastatic renal cell carcinoma, aortic stenosis, and chronic plantar neuropathy presented with a three-week history of proximal bilateral upper and lower extremity weakness, neck weakness, and associated rapid-onset muscle pain following one cycle of treatment with pembrolizumab for metastatic renal cell carcinoma. At initial presentation, she had 0/5 strength in thighs and deltoid abduction and 2/5 strength in bicep flexion and plantarflexion. Lab studies were notable for CK of 41,000 and myoglobinuria. MRI showcased increased thigh muscle edema and areas of possible myonecrosis, suggestive of possible myositis and necrotizing myopathy. EMG showcased evidence of AIDP with superimposed myopathy of proximal upper and lower extremities; muscle biopsy showcased necrotizing myopathy and type 2 myofiber atrophy. The patient underwent plasma exchange and was started on pulse steroids with good clinical response, as noted by a significant reduction in CK and improved strength; however, she subsequently developed worsening weakness, dysphagia, and acute hypoxic respiratory failure leading to aspiration pneumonia. Treatment with IVIG and high-dose steroids was initiated, leading to marked clinical improvement.

Conclusions

Concurrent ICIAM and AIDP represent a serious and previously unreported autoimmune phenomenon arising from pembrolizumab therapy. Given the increasing use of PD-1 inhibitors and the significant morbidity and mortality associated with neurologic IrAEs, this case underscores the importance of timely interdisciplinary diagnostic and therapeutic intervention in suspected cases.

Abstract #125

Sameer Ebrahim

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Is a spring plate for a posterior wall acetabular fracture a harbinger of eventually needing total hip arthroplasty?

Background/Purpose
Acetabular fractures are complex to manage, particularly due to the significant risk of post-traumatic arthritis, which frequently necessitates conversion to total hip arthroplasty (THA). Posterior wall fractures are especially challenging, as small bone fragments associated with these fractures can be difficult to stabilize using conventional plate and screw fixation. A commonly employed solution is the use of a posterior wall spring plate to provide additional support. However, the senior author's experience suggests that using a spring plate may be linked to an increased rate of conversion to THA, a hypothesis that this study aims to investigate. This issue is increasingly relevant, as immediate THA is now being considered a viable option for younger patients who were traditionally seen as poor candidates for early arthroplasty.

Methods
In this retrospective study, we analyzed 250 cases of operatively managed acetabular fractures treated at a Level-1 trauma center from 2018 to 2022. Patients were categorized by fracture type, surgical technique, and post-operative complications, particularly post-traumatic arthritis requiring THA, using the Judet and Letournel classification. We specifically examined the outcomes of patients with posterior wall fractures treated with spring plates (SP) versus those without (NSP).

Results
Among 102 patients with posterior wall fractures, 34 received a spring plate, and 68 did not. At one-year follow-up, the THA conversion rate was 14.7% in the SP group compared to 7.4% in the NSP group. For isolated posterior wall fractures, 11.1% in the SP group required THA, while none in the NSP group did. The average time to THA was shorter for the SP group (206 days) than the NSP group (320 days)

Conclusions
These findings suggest a potential association between spring plate use, higher rates of post-traumatic arthritis, and earlier THA conversion, offering valuable insights when considering immediate arthroplasty for posterior wall fractures.

Abstract #123

Ryan Ellis

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Effectiveness of Cycloheximide and Spermine Inhibition in Cryptococcus neoformans

Background/Purpose
Cryptococcus neoformans is a fungal pathogen that globally affects roughly 1 million people per year. This pathogen typically infects those immunocompromised with HIV infections most notably. Our research focused on in the presence of varying concentrations of Cycloheximide and Spermine, will agp2 provide resistance against their effects on preventing growth of Cryptococcus.

Methods
Experiments were performed where we grew cells on various concentration plates of YEPA, YEPG, Cycloheximide, and Spermine and spot assays performed. In addition, Logphase liquid growth was performed for the Cycloheximide and Spermine. Growth was monitored over 48 and 72 hours.

Results
The results did not turn out how we initially expected. We found that all strands of Cryptococcus were equally sensitive to Cyclohexamide at 30 and 37 degrees celsius. As for Spermine, the hmn1 mutant was more sensitive than the other strands at 30 and 37 degrees celsius.

Conclusions
Contrary to what was expected, Cryptococcus behaved differently than Saccharomyces when evaluating mutants and inhibitors. Next steps will need to look at differing concentrations to see if that has a varying impact on how the inhibitors will perform against mutant strands of this deadly fungal pathogen.

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Abstract #93

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Overview of sex-related differences in sleep patterns and its association with the development and regulation of type 2 diabetes.

Background/Purpose
Type 2 diabetes mellitus (T2DM) is widely prevalent among both men and women as a comorbidity associated with several different disease states. The development and treatment have been associated with lifestyle factors such as nutrition and exercise, but other factors such as sleep have not been well enough researched to determine its role in the physiology or pathophysiology on glycemic control. The purpose of this research is to review current literature available on the sex-related differences in association between sleep habits and T2DM and potential research that could advance the understanding of the development and management of T2DM with sex-specific needs in mind.

Methods
Literature included in this systematic review were gathered through the use of an advanced sex and gender search tool created by the Sex & Gender Specific Health Task Force and Program team at Texas Tech University that works within the PubMed database. Other terms were added to the query such as, “diabetes”, “sleep”, “REM”, “insomnia”, and “circadian rhythm”, in order to find articles with subjects pertinent to this review. The use of this query resulted in 41 total articles which were then reviewed, and 12 articles were determined to contain sufficient material to meet the criteria of this review.

Results
Of the 12 articles that met the criteria of this review, there was a consensus that both long and short interval sleeping had increased risk of T2DM and loss of glycemic control. There is noted to be a gender difference in all the articles mentioned but there is no clear consensus as to which group may be affected more or how the mechanism of action differs between the sexes. Elevated blood sugar levels were noted specifically in women who were premenopausal when compared to younger populations (male and female) or even older men who participated in short and long interval sleeping.

Conclusions
Sleep habits have shown to have an effect on the incidence and management of T2DM, but there is not yet enough evidence to show how this mechanism works and how it effects men and women differently. Further investigation of these effects and sex differences can improve outcomes in individuals that are at risk for or have developed T2DM.

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Abstract #96

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Drivers of Inequity in Colorectal Cancer Screening Among Minority and Underserved Groups and Proposed Interventions to Bridge Gaps

Background/Purpose
Current screening modalities for colorectal cancer (CRC), particularly colonoscopies, have demonstrated significant efficacy in reducing both the incidence and mortality of colon cancer. Nevertheless, CRC screening rates persist below the national target, largely due to significant gaps in screening across racial and ethnic minorities and underserved groups within the US. While research investigating the causes of the notable disparities is limited, existing literature points to socioeconomic barriers as a potential contributor to the current state of health inequity. These barriers exist at numerous points, including at the patient level to the healthcare system level, alongside environmental and lifestyle risk factors such as limited access to transportation, stable housing, and a healthy diet. Research suggests that multi-component evidence-based interventions at multiple points in the care continuum have the potential to diminish disparities in CRC screening and mortality in disadvantaged groups. The purpose of this study is to investigate the socioeconomic barriers that contribute to notably lower CRC screening across racial/ethnic minority groups and underserved communities and to suggest multicomponent and evidence-based interventions that reduce disparities to lower CRC incidence and mortality based on findings.

Methods
Patients at Prisma Health Center for Family Medicine – Greenville aged 45 years and older, the ages of CRC screening recommendations per USPSTS guidelines, will be sent anonymous surveys that utilize the Health Belief Model (HBM). It will contain questions assessing perceived susceptibility, severity, benefits of taking action, barriers from taking action, cues to action, and self-efficacy about current CRC screening recommendations. Results will be analyzed for trends in responses. Descriptive statistics will be used to characterize and summarize the data obtained. The information will then be analyzed using the commercially available statistical program and examined for significant differences between gender, age, and other similar variables. Analysis will be completed using a chi_square for the non-continuous variables. Significance will be defined as $p<0.05$ level of confidence.

Results
Preliminary analysis of the survey data is expected to reveal key socioeconomic barriers impacting colorectal cancer (CRC) screening rates among minority and underserved groups. We anticipate that common barriers will include lack of transportation, time, insurance, and financial constraints. We also expect to find variations in perceived susceptibility and severity, with minority and disadvantaged groups potentially reporting lower self-efficacy and less trust in healthcare interventions. The results will likely underscore the need for multicomponent, patient-centered interventions, such as those indicated in the cues to action, that address these barriers at multiple levels—from individual patient education to healthcare system improvements.

Conclusions
This research highlights the importance of identifying and addressing socioeconomic barriers to CRC screening in underserved populations. By pinpointing specific obstacles that deter minority and disadvantaged groups from engaging in screening, this study underscores the necessity of interventions that address the gaps in health equity. The findings could provide valuable insights for healthcare providers and policymakers and help guide the development of tools to reduce disparities in CRC incidence and mortality. These efforts are crucial for fostering a more equitable healthcare system and improving outcomes for vulnerable populations.

Abstract #39

Kathleen Fallon

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Investigating Diagnostic Technology Use and Adoption in the Workflow of Sepsis Diagnosis and Treatment in the Emergency Department

Background/Purpose
Sepsis is a life-threatening condition that occurs in response to an infection, and it affects more than 1.7 million Americans each year. Prompt diagnosis is paramount, as each additional hour that treatment is delayed increases the mortality risk by over 7%. Clinical decision support systems (CDSS) have been implemented into the electronic health record databases to help physicians in the emergency Dept. (ED) diagnose and treat sepsis earlier. However, it has been reported that there are still barriers to adoption by all clinicians, especially due to its integration into current workflows. Thus, this research seeks to identify opportunities to facilitate CDSS adoption among ED clinicians.

Methods
An observational study with focus groups and interviews is ongoing to understand current CDSS use and to understand the barriers in the care process. We will evaluate the workflow of triaging and diagnosing a septic patient, document communication between members of the healthcare team, and observe their interactions with the CDSS tool. Analysis of these results will be performed to identify gaps in the CDSS usability and opportunities for better workflow integration.

Results
Preliminary findings from physician observations indicate that false alarms for potentially septic patients and the redundant and time-consuming nature of the CDSS tool are barriers to adoption. Further study will identify patterns of common barriers to prompt sepsis diagnosis and treatment in the workflow.

Conclusions
By investigating workflow and usage of CDSS, a better understanding can be gained of current practices and bottlenecks in diagnosis and treatment procedures. This information can then be used to modify the clinical decision support systems and optimize them for higher physician and nurse adherence, which can in turn improve outcomes for septic patients in the ED.

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Abstract #103

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Retrospective Analysis of Radiation Dose Savings Among Patients Undergoing UAE, PAE, and TIPS Procedures

Background/Purpose
Prostate artery embolization (PAE), Transhepatic Intrajugular Portosystemic Shunt (TIPS), and Uterine artery embolization (UAE) are interventional radiology (IR) procedures that offer treatment for benign prostatic hyperplasia, portal hypertension, and uterine fibroids, respectively. IR procedures have been utilized as minimally invasive procedures that allow for lower morbidity, fewer hospital stays, and overall cost savings. However, IR procedures also require the introduction of radiation to the patient and provider. This may cause negative outcomes such as stochastic injuries or skin necrosis. PAE and TIPS are high does radiation procedures while UAE risks irradiating radiation sensitive reproductive organs. The purpose of this study was to evaluate radiation exposure during these procedures to determine methods of reducing radiation exposure in patients.

Methods
All patients that underwent UAE, PAE, and TIPS procedures between 8/31/2021 and 4/1/2023 at a single institution were retrospectively evaluated. Typical demographic and clinicopathologic data were collected to include technical variables such as procedure time (PT), number of acquisitions (Naq), and fluoroscopy time (FT).

Results
A total of 100 patients underwent PAE (n=32), UAE (n=27), and TIPS (n=41) procedures. PAE and TIPS had the highest averages of contrast dose (140.9 and 112.47) and air kerma (3103.68 and 1696.95). PAE and TIPS had the highest FT (34.4 and 28.8), and Naq (762.32 and 416.82) respectively.

Conclusions
These parameters may contribute to an increased radiation exposure and demonstrate the need for radiation reduction methods. In addition, all patients underwent some form of prior mapping. This may also offer an avenue for reducing overall radiation exposure by employing non-fluoroscopic guiding methods. Future directions include to determine the significance between the clinicopathologic data and radiation exposure.

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Abstract #101

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Sex Differences in Clinical Risk Factors for Alzheimer's Disease Patients with Early-Onset and Late-Onset

Background/Purpose
This study aims to identify clinical risk factors that may be associated with sex (male or female at birth) in Early-Onset Alzheimer's Disease (EAOD) and Late-Onset Alzheimer's Disease (LOAD) patients.

Methods
Retrospective data was collected concerning patient demographics and clinical risk factors in EOAD and LOAD patients; these patients received care at a PRISMA Health Facility during the February 2016 to August 2020 window. Univariate analysis assessed associations between clinical variables in EOAD and LOAD patients, stratified by sex. Logistic regression analyzed variables from the univariate analysis, calculating adjusted odds ratios (ORs) and 95% confidence intervals (CIs) to identify the odds of EAOD or LOAD diagnosis in patients with certain demographic or clinical risk factors, based on sex.

Results
In the adjusted analysis, male EOAD patients were more likely to present with gait dysfunction (OR = 10.797, 3.257-35.792), use of central acetylcholinesterase inhibitor (OR = 3.141, 1.881-5.244), memantine (OR = 1.587, 1.029-2.447), and alcohol consumption (OR = 1.801, 1.155-2.809). Females with EAOD were more likely to present with osteoporosis (OR = 0.345, 0.155-0.778), anxiety (OR = 0.412, 0.203-0.833), use of second-generation antipsychotic (OR = 0.425, 0.230-0.786), and valproate (OR = 0.246, 0.146-0.414). Male LOAD patients were more likely to present with dyslipidemia (OR = 1.720, 1.489-1.987), peripheral vascular disease (OR = 2.324, 1.828-2.955), obstructive sleep apnea (OR = 2.330, 1.768-3.070), alcohol consumption (OR = 1.480, 1.250-1.753), and taking valproate (OR = 1.180, 1.010-1.379). Female LOAD patients were more likely to present with osteoporosis (OR = 0.310, 0.254-0.380), urinary tract infection (OR = 0.638, 0.521-0.782), and rheumatoid arthritis (OR = 0.104, 0.043-0.248).

Conclusions
These findings indicate specific risk factors and comorbidities associated with EOAD or LOAD that were sex dependent. These findings illuminate the need for screening strategies to increase awareness of EOAD or LOAD development in male and female patients.

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Abstract #81

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Evaluating Fatigue and the Effects of Chemotherapy Regimens on Skeletal Muscle Mitochondrial Function in Breast and Gynecological Cancer Patients using Near-Infrared Spectroscopy

Background/Purpose

Chemotherapy induces oxidative stress and subsequent skeletal muscle mitochondrial dysfunction in patients with cancer. Mitochondrial dysfunction is a significant factor in cachexia, a significant contributor to mortality rates in this population. Information lacks regarding the impact of different chemotherapy regimens on skeletal muscle mitochondrial dysfunction and fatigue. To evaluate the effects of varying chemotherapy regimens on skeletal muscle mitochondrial dysfunction and fatigue in breast and gynecological cancer patients.

Methods

The Brief Fatigue Inventory (BFI) is utilized to quantify fatigue levels, providing a comprehensive assessment of fatigue severity and its impact on daily life. Patients complete the BFI at baseline and during each subsequent visit. Following survey completion, patients participate in an on/off kinetics cycling protocol, during which near infrared spectroscopy (NIRS) data is recorded. NIRS is used to noninvasively assess skeletal muscle mitochondrial function by measuring the changes in hemoglobin oxygenation and deoxygenation of the vastus lateralis muscle while cycling on a stationary bike. Data is being analyzed using a generalized linear mixed model with a gamma distribution and log link function to evaluate the effect of cycle number on average tau, accounting for individual variability across subjects.

Results

This study is currently in the data collection phase, with n=23 completed participants. The NIRS model revealed a significant positive association between chemotherapy cycle number and average tau (estimate=0.1017, $p<0.001$), suggesting that average time needed to recover increases with successive cycles. These findings highlight the relevance of cycle progression on average tau while recognizing individual differences across participants. Additionally, analysis revealed that BFI scores showed a significant positive correlation with visit number (estimate=0.0129, $p=0.0472$), suggesting increased fatigue as chemotherapy treatments progress.

Conclusions

These findings may provide insight into how varying chemotherapy regimens affect skeletal muscle mitochondrial function and reported fatigue. This can potentially influence future treatment guidelines for breast and gynecological cancer patients.

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Abstract #32

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Sex-Dependent Nutritional Impacts on Puberty Onset

Background/Purpose
A link between earlier onset of puberty with nutrition and dietary behaviors has been researched for years due to concerns involving increased risk of adverse health outcomes in those with earlier pubertal development. Historically clinical research has focused on the male sex in their research of physiologic conditions; however, lifestyle medicine aims to consider an individual's characteristics in their holistic treatment of their conditions. Our goal was to analyze the current research to determine how nutrition may impact the onset of puberty differently in the sexes.

Methods
The PubMed Advanced Search Builder was used to filter NIH papers by sex and gender differences. The resulting papers were then filtered for early onset puberty and nutrition. These papers were analyzed for patterns in dietary behaviors and their implications in each sex.

Results
Our narrowed search yielded 54 papers related to our focus on puberty and dietary behaviors. The research noted a diet consisting of higher animal protein resulted in a greater sex hormone concentration and a decrease in SHBG in both sexes. Different plant-based diets were found to have different associations with pubertal stages in each sex. Vegetables and lean proteins showed a correlation with breast stage in females, while processed meats and refined grains showed increased testicular volume in males.

Conclusions
Our analysis found that nutritional behaviors in children have sex-specific impacts on puberty. This knowledge can guide clinicians and medical education to focus on customizing diet for children based on their biological sex to prevent earlier onset of puberty and its potential future medical implications.

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Abstract #44

Andre Gagliano

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Defining Medication Reconciliation Practices and Needs at GMH: A Pilot Qualitative QI Exploration

Background/Purpose
Medication Reconciliation is essential to defining a patient's current medication list, but accurate medication reconciliation is difficult to obtain in the high-pressure, time-sensitive Emergency Dept. (ED) setting. Inaccurate medication reconciliation can lead to medication errors and adverse drug events (ADEs). This project develops the groundwork for evidence-based process improvement by defining the current process for medication reconciliation, engaging key stakeholders, and identifying care gaps for intervention within an agile, data-driven, quality improvement (QI) process.

Methods
Initial project development followed a structured, modified Delphi approach, that included literature review, stakeholder engagement, and IRB submission. Process mapping and semi-structured interview protocol were developed to interview healthcare workers (HCW) involved in the medication reconciliation process (ED physicians, pharmacists, nurses, and patients).

Results
Preliminary results include literature review, definition and involvement of key stakeholders, and IRB preparation. Our literature review revealed that while elderly ED patients are clearly at risk due to inadequate medication reconciliation, there is no clear solution to this serious problem. Key stakeholders at Prisma Health include physicians, nurses, pharmacists, and patients. IRB preparation develops the basis for generalizable evidence development.

Conclusions
ED medication reconciliation is a critical process that is limited by the urgency and acuity of ED patient care. Medication reconciliation is a complex process influenced by systemic factors, patient characteristics, and environmental influences. Our key stakeholders have provided valuable insight during our initial partnership. Our process map reveals details of the process and will be essential for agile, rigorous QI cycles. This project has further provided the basis for and initial aim of an HSC seed grant submission. In future work, we will complete semi-structured interviews of key stakeholders to identify challenges and opportunities for evidence-generating interventions. This work will support the development of our system as a Learning Health System.

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Abstract #54

Burns Gaskins

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A Novel AI-Based Solution for Streamlining Prostate Cancer Documentation in Electronic Health Records

Background/Purpose
Clinically, the Tumor, Node, Metastasis (TNM) system is fundamental for cancer staging, shaping prognosis and treatment options. Furthermore, healthcare systems pursuing National Cancer Institute Community Oncology Research Program (NCORP) designation depend on this staging system to access advanced therapies and national research databases. However, the current approach to TNM documentation is labor-intensive, requiring considerable personnel for manual processing. Artificial intelligence (AI) offers a promising channel to streamline this process. Our study evaluates the ability of a novel AI algorithm to automate the extraction of TNM staging from the Electronic Health Record (EHR).

Methods
The AI program analyzed the charts of 100 patients with urology encounters recorded in the EHR, including information regarding standard urological evaluations, PSA values, digital rectal exams, MRIs, and biopsy and pathology reports of patients who underwent prostatectomy. When TNM staging was correctly documented, the AI algorithm extracted the TNM stage (true positive). In cases where TNM staging was absent, charts were classified as true negative (no prostate cancer) or false negative (prostate cancer without documented TNM staging). False positives were defined as cases where documentation stated there was a prostate cancer diagnosis but was not confirmed by biopsy or prostatectomy.

Results
The program analyzed the charts of 100 patients evaluated for suspected prostate cancer, showing a 96.1% positive predictive value and 100% negative predictive value. Additionally, the program demonstrated 100% sensitivity and 95% specificity.

Conclusions
These promising preliminary findings from a small patient cohort suggest the AI program accurately identifies prostate cancer staging based on TNM criteria documented in patients' EHRs. Our research seeks to expand the study to assess whether a more detailed note-by-note approach can improve the AI's accuracy, potentially enhancing workflow efficiency for those currently extracting and documenting this information manually in the EHR and NCORP database.

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Abstract #15

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SARS-CoV-1 Non-Structural Protein 1 Mutagenesis for the Investigation of Coronavirus Immune Inhibition Mechanisms

Background/Purpose

Severe acute respiratory syndrome coronavirus-2 (SARS-CoV-2) was identified as the source of the COVID-19 pandemic, leading to significant human morbidity and mortality. Early treatments and vaccines for SARS-CoV-2 infections were established from foundational research of the closely related SARS-CoV-1 virus that caused substantial disease in years prior. One protein of note is the Non-Structural Protein 1 (Nsp1) of SARS-CoV-1 as it is involved in the mechanism of hijacking host cellular machinery to evade natural immune surveillance. Nsp1 serves two primary functions: host translation inhibition and immune dysregulation of the antiviral interferon response. The exact functional mechanisms of Nsp1, however, are still unclear. Previous studies have suggested that Nsp1 plays a role in host stress granule formation and is associated with the ADAR1 immune regulatory protein. The objective of this research is to determine if the colocalization of Nsp1 and ADAR1 contributes to immune dysregulation.

Methods

QuikChange site-directed mutagenesis was used on myc-tagged_NSP1 wild-type plasmids to create three unique mutants, each with a combination of mutations affecting the translational and/or immune inhibition functions of the protein. Wild-type and mutant Nsp1 plasmids, along with GFP-tagged ADAR1 plasmids were then expressed in the A549 human lung epithelial cells. Western blot and fluorescence microscopy were conducted on the transfected cells to quantify the Nsp1 protein expression as well as localize Nsp1 and ADAR1 intracellularly.

Results

ADAR1 plasmids were successfully expressed in A549; however, the expression was only 5-10% efficient. The expression of Nsp1 was not confirmed due to the interfering signals of endogenous myc proteins that are naturally expressed in the A549 cells. For future expression experiments, Nsp1 mutations will be introduced into new V5-tagged Nsp1 plasmids.

Conclusions

The results of these studies will provide key insights into the mechanisms by which coronavirus Nsp1 proteins contribute to immune evasion by these clinically important viruses.

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Scholars Fellowship Award

Abstract #87

Bricen Ghent

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Investigating Patient-Reported Outcomes Measurement Information System Scores (PROMIS) and Skeletal Muscle Mitochondrial Function in Breast or Gynecologic Cancer Patients Undergoing Chemotherapy

Background/Purpose

Profound fatigue is an adverse effect to chemotherapy that significantly affects patients' quality of life. Near Infrared Spectroscopy (NIRS) noninvasively measures muscle mitochondrial capacity by calculating the volume of oxygenated and deoxygenated hemoglobin and producing the recovery rate constant of skeletal muscle over time. PROMIS® (Patient-Reported Outcomes Measurement Information System) is a set of person-centered measures that evaluates and monitors physical, mental, and social health in adults and children. The purpose of this study is to examine the effects of chemotherapy on mitochondria in patients diagnosed with breast and gynecological cancers undergoing chemotherapy.

Methods

Eligible patients who choose to participate complete a baseline lactate threshold test on a stationary bike to determine their moderate intensity exercise level and an On/Off kinetics test (alternating rest/exercise protocol) to collect the recovery rate over time. The patient subsequently completes the NIRS protocol test prior to the start of every chemotherapy cycle. During each NIRS visit, a PROMIS® survey is administered to assist in determining changes in patients' QOL over time.

Results

The NIRS study is undergoing data collection with n=23 completed female participants. The NIRS data identified a significant positive association between chemotherapy cycle number and average tau (estimate = 0.1017, $p < 0.001$), indicating mitochondrial dysfunction occurs in patients undergoing successive bouts of chemotherapy. PROMIS® scores are being analyzed. We hypothesize patients will have a lower PROMIS® score, representing lowered QOL with each chemotherapy cycle.

Conclusions

Outcomes from this study may inform healthcare providers on the relationship between chemotherapy-induced fatigue, mitochondrial dysfunction, and quality of life, providing a scientific basis for improving fatigue through holistic health interventions during the chemotherapy journey. In the future, this study could also be expanded to investigate the relationship between chemotherapy-induced fatigue, mitochondrial dysfunction, and quality of life in cancers affecting men.

Student research funded by
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Abstract #19

Sarah Goncher

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Stroke Outcome Optimization Project - Comparing Patient Demographics and Language Outcomes

Background/Purpose
Strokes, particularly ischemic strokes, are a leading cause of long-term disability worldwide. Among the various complications, language deficits are one of the most prevalent and disruptive for patients. Creating datasets that analyze these disabilities in relation to patients' medical histories, socioeconomic factors, and other demographics can enhance outcomes for future stroke patients.

Methods
Utilizing the Stroke Outcome Optimization Project dataset that we have developed in previous years, we plan to expand our data collection by recontacting 307 eligible patients to assess key health outcomes. A comprehensive survey has been designed to gather information on education history, language background, socioeconomic status, support structures, and include questionnaires for depression and anxiety, providing a baseline of each patient's demographics. Additionally, the remote MoCA test will be employed to evaluate the patients' current language and cognitive abilities.

Results
By comparing demographic information with language outcomes, we aim to identify trends that could inform prognoses for future stroke patients.

Conclusions
This research has the potential to yield valuable insights that can guide patient education, enhance mental health support, and facilitate recovery strategies. Given the increasing prevalence of strokes, the establishment of such a dataset is crucial for improving the overall care and quality of life for stroke survivors.

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Abstract #98

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Respiratory Syncytial Virus (RSV) and SARS-CoV-2 in Pediatric Patients and its Relationships with Social Determinants of Health

Background/Purpose

Background: The COVID-19 pandemic and the resurgence of respiratory syncytial virus (RSV) raise concerns about their impact on pediatric populations, particularly regarding the influence of social determinants of health. Understanding how socioeconomic status and insurance coverage affect the incidence and severity of these infections is crucial for targeted interventions. Purpose: This project evaluates the impact of social drivers of health on the incidence and severity of pediatric COVID-19 and RSV infections.

Methods

Patient data from pediatric patients with positive tests for either RSV or COVID-19 from December 2020 to February 2021 are acquired and analyzed. Demographics are categorized by gender, race, and socioeconomic status to assess trends in infection severity and incidence.

Results

Preliminary analysis of the data is expected to reveal the entent to which socioeconomic factors influence the incidence and severity of infections. Ongoing analysis will explore specific trends and correlations between patient health factors and pediatric infectious disease.

Conclusions

The findings from this research can inform public health strategies and clinical practices aimed at mitigating the impact of these respiratory infections in vulnerable pediatric populations, thereby enhancing patient care and outcomes in the context of social determinants of health.

Student research funded by
Scholars Fellowship Award

Abstract #79

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Castleman's Disease: a single institution's experience and review of the literature

Background/Purpose

This study aimed to evaluate the diagnosis, treatment, and outcomes of Unicentric (UCD) and Multicentric (MCD) Castleman's Disease diagnosed and/or treated at a single regional institution.

Methods

Following IRB approval, all CD patients diagnosed and/or treated at a single institution between January 1, 1996, and June 1, 2024, were retrospectively evaluated. Demographic and clinicopathologic variables were collected and follow-up and survival were calculated through 6/1/24. A board-certified hematopathologist reviewed all cases. All statistical analyses were conducted in R version 4.2.0.

Results

Stratification of the data by UCD v. MCD was significant for race (p=0.0145), BMI (p=0.0183), elevated ESR/CRP (p=0.021), histologic variant (p=0.001), and lymph node size (p=0.0236): at our institution, UCD patients were more likely to self-identify as White, be overweight/obese, display the hyaline vascular histologic variant on histology, and have larger lymph nodes. Of note, age at diagnosis (p=0.1625), sex (p=0.5648), diabetes (p=0.6683), autoimmune disease (p=0.5433), and family history of cancer (p=0.4349) were not significantly different between UCD and MCD cohorts.

Conclusions

Castleman's disease (CD) is a diagnosis of exclusion and is definitively confirmed by biopsy alone. Imaging is often an important tool for evaluating lymphadenopathy; flow cytometry allows differentiation between CD, lymphoma, and non-Hodgkin's lymphoma. UCD should be suspected in patients presenting with lymphadenopathy and mass-related symptoms: UCD preferentially affects White, overweight/obese individuals; lymph nodes are larger than those in MCD individuals; elevated ESR/CRP is not exclusive to MCD patients. MCD should be suspected when patients present with constitutional symptoms +/- lymphadenopathy. Since CD diagnosis relies on biopsy, pathologists must educate clinicians on results and advise on appropriate management.

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Abstract #49

Hanes Grafe

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Impact of Various Adaptive Sports on Depression and Quality of Life in Persons with Disabilities

Background/Purpose
Disabling injuries, such as spinal cord injuries, traumatic brain injuries, and amputations, impair activities of daily living. Community-based adaptive sports programs have demonstrated success in engaging individuals to become more physically active. The purpose of this study is to examine the effects of adaptive sports programs (using Cycling, Pickleball, and Yoga) in persons with disabilities on QOL and depression as compared to these individuals prior to participation.

Methods
A within subjects design is being used for this prospective study. A cohort of participants with various disabilities was invited to attend any of the adaptive sports studied. Participants could either be novel to the sport or have participated in the sport and underwent a washout period of at least 8 months. Multiple sports could be attended. Participants completed a modified SF-36 Quality of Life survey and the Center for Epidemiologic Studies Depression scale (CES-D) using REDcap online surveys. Participant attendance was tracked at each event. Post-sport data for each questionnaire were collected. Paired sample t-tests were conducted to examine changes at an alpha=0.05.

Results
Fourteen participants completed the pre-intervention surveys and participated in a sport. To date, 12 participants completed post surveys. In these 12 participants, Non-significant ($p>0.05$) but potentially clinically meaningful trends were observed for improvements in physical functioning (20%), as well as role limitations due to physical (26%) health. Some outcomes showed the opposite of what was expected such as increased fatigue (3%) and pain (13.6%). Interestingly an increase in depression (CES-D) was observed with a concomitant increase in emotional well-being (SF-36)..

Conclusions
These preliminary findings may highlight the importance of adaptive sports within communities for improving quality of life and mental health. Larger sample sizes are needed to determine statistically significant changes. The paradoxical mental health results need to be explored further.

Student research funded by
Scholars Fellowship Award

Abstract #30

Patricia Greene

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Unveiling Opioid Prescribing Patterns Following Outpatient Anorectal Surgery

Background/Purpose
Overprescription of opioids following surgery remains a significant contributing factor to the opioid epidemic. Outpatient anorectal surgeries are no exception, often resulting in high opioid prescriptions postoperatively. We report the opioid prescribing patterns within a PRISMA Health colorectal surgery practice following anorectal surgery.

Methods
A retrospective review was performed of patients undergoing outpatient anorectal surgeries between October 2022 and September 2023 within a single colorectal surgery practice. Data was divided into subgroups based on type of anorectal procedure performed. Endpoints were the types of opioids prescribed, number of opioids prescribed, and number of requested refills.

Results
422 patients were analyzed with 407 receiving postoperative opioid prescriptions. The most prescribed opioid was oxycodone with an average number of 30 pills (132 morphine milligram equivalent (MME)) with a range of prescribing 3 to 45 pills. Hemorrhoidectomies were prescribed the most MME at 225, with statistically significant difference in amounts prescribed versus other procedures including fistulotomy, surgeries for fissure, abscess, excision of anal or rectal lesion, and pilonidal cystectomy. There was variability in prescribing between residents, fellows, and attendings, with attending surgeons prescribing the least amount of MME (150 MME). A statistically significant difference was also noted between attending and fellow prescribing habits. 18.75% of patients required at least 1 refill on opioids following initial prescription with 69% of this subgroup requiring only 1 refill. There was no significant difference noted in refill requests amongst different procedures.

Conclusions
Standardization of opioid prescribing based on procedure type, along with preoperative pain management counseling may be beneficial in reducing opioids prescribed and variability in prescribing habits. With this information, there is a need to implement a post-operative pain management protocol without sacrificing patients' pain management satisfaction and recovery.

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Abstract #55

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Decoding Disparities: How Genetic Mutations Impact Breast Cancer Across Racial Groups

Background/Purpose
Breast cancer is the second leading cause of cancer death in women, with African American women facing disproportionately high mortality rates. Research suggests that socio-economic factors and molecular differences largely drive this disparity. Examining genetic mutations helps to uncover the molecular mechanisms influencing these outcomes. However, most studies focus on BRCA mutations, which do not explain the racial disparity. This study analyzes mutations in an additional 50 cancer-associated genes across White and African American patients.

Methods
The study uses data from the Prisma Health Cancer Center biorepository (Greenville, SC, USA) with 194 breast cancer patients (161 White, 33 African American) collected between 2012-2021, screened for mutations by Precision Genetics. Analyzed genes include 10 tumor suppressors, 33 oncogenes, and 7 context-dependent genes. Statistical analysis assessed racial disparities in mutation and subtype frequency.

Results
Racial differences were found in mutation frequencies, notably in the PIK3CA, KDR, TP53, KIT, and MET genes. JAK3 mutations showed a significant racial disparity, with higher prevalence in African Americans (24%) compared to Whites (2%) ($p < 0.001$). Specific mutations varied by race: PIK3CA p.His1047Arg was more common in Whites (30% White, none in African Americans), while p.Ile391Met was higher in African Americans (24% White, 79% African American). African Americans had a higher prevalence of triple-negative breast cancer (TNBC), associated with poorer outcomes (11% White, 27% African American). Overall mutation rates across all genes analyzed were similar (81% White, 82% African American).

Conclusions
While overall mutation rates are comparable, mutation and subtype frequencies differ between African American and White patients. These results emphasize the need for personalized breast cancer treatments that consider genetic variability. Including African American women in clinical trials is crucial, as understanding these molecular differences could lead to tailored therapies and improved survival, especially in African American women who are historically underrepresented in research.

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Abstract #114

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Epigenetic Profiling of Cell-Free DNA in IVF Embryos

Background/Purpose
In vitro fertilization (IVF) is a widely used form of Assisted Reproductive Technology (ART). Currently, embryo selection primarily relies on morphology and genetic screening for aneuploidy. However, analyzing nucleic acids within blastocoel fluid could offer an additional molecular marker to enhance selection accuracy. The project aims to assess the epigenetic state of cell-free DNA contained in the blastocoel fluid-conditioned media from day-5 human embryos to profile the post-translational modifications on histones associated with apoptosis.

Methods
Blastocoel fluid-conditioned media was collected from day-5 IVF blastocysts that underwent preimplantation genetic testing for aneuploidies (PGT-A). Media from euploid embryos (grouped by successful and unsuccessful implantation outcomes) and aneuploid embryos were pooled. Pooled samples were acid extracted to isolate histones present in the media (Histone Acid Extraction Kit, Active Motif). Histone samples were run on SDS-PAGE gels and Western blotted for histone modification specific antibodies: anti-Histone H3K4me3, anti-Histone H3K9me3, anti-Histone H3K27me3, and anti-Histone H3K6ac (Active Motif).

Results
Western blot analysis detected the Histone H3K27 trimethylation modification in the histones extracted from pooled euploid blastocoel fluid-conditioned media samples.

Conclusions
This study shows that histone modifications, specifically H3K27 trimethylation, can be detected in pooled blastocoel fluid-conditioned media from euploid IVF embryos. H3K27 trimethylation is known to be associated with apoptosis and is crucial for early embryo development. Our finding that this apoptotic histone modification is present supports previous research from our lab on apoptotic gene expression in similar media. Future studies will investigate if H3K27 trimethylation levels can serve as a marker for embryo viability based on implantation outcomes.

Abstract #60

Jasmine Hawkins

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Baseline Sunscreen Habits and Awareness Among Medical Students

Background/Purpose

Identifying medical student knowledge of sun protection is integral to the health of the next generation of physicians and their patients. Previous studies have investigated personal practices of sun protection, skin cancer prevention, and knowledge about ultraviolet exposure amongst medical students. However, as cultural, environmental, and educational perspectives vary across regions, it is necessary to investigate these topics within multiple medical schools as understanding these baseline habits can inform targeted interventions to improve sun safety practices on medical school campuses. This study investigates sunscreen habits among students attending the USC School of Medicine Greenville (USCSOMG).

Methods

To determine baseline sunscreen habits and awareness among medical students, a survey with multiple-choice and Likert scale-style questions was distributed through USCSOMG school emails. Data collection is ongoing with a current survey response rate of 18%. Preliminary data was analyzed descriptively.

Results

Preliminary data shows only 33.3% of medical students use sunscreen daily. Among potential barriers to sunscreen use, forgetfulness was cited most often by participants (61.5%) followed by inconvenience (34.6%). Other barriers included cost (23.1%) and lack of awareness (3.8%). Many respondents (50%) indicated they would use sunscreen more frequently if it were freely available on campus. Finally, when asked how much they agreed with the statement, "Sun protection is important for my overall health," only 48.7% strongly agreed.

Conclusions

Sunscreen is one of the most important factors in skin cancer prevention. This preliminary data shows poor sunscreen habits amongst medical students. Significant barriers such as forgetfulness, inconvenience, and cost likely impact sunscreen use. To reduce barriers and increase sunscreen use, the utilization of public sunscreen dispensers, including placement in well-visualized areas at on-campus facilities, may be a positive-protective factor for the overall skin health of medical students.

Abstract #104

Savannah Heitmann

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An Investigation into Deprescribing Proton Pump Inhibitors

Background/Purpose
Proton Pump Inhibitors (PPIs) treat Gastroesophageal Reflux Disease (GERD) by irreversibly inhibiting the H+/K+ ATPase pump, thus decreasing gastric acid secretion. Currently, the American College of Gastroenterology recommends an 8-week course of PPIs for GERD symptoms; however, this class of medication is often overprescribed. Prolonged usage of PPIs has been linked to chronic kidney disease, osteoporosis, dementia, and Clostridioides difficile infection. This study aims to create a deprescription algorithm as there is currently no standardized approach to minimize the amount of rebound acid hypersecretion patients face while discontinuing their PPI.

Methods
In this randomized trial, patients who have been on omeprazole, pantoprazole, esomeprazole, or lansoprazole for more than 8 weeks were assigned to one of four treatment arms designed to gradually reduce PPI use over a four-week period. A cohort of 12 patients was assessed at baseline with the Reflux Symptoms Questionnaire 7 day recall (RESQ-7) and Gastroesophageal Reflux Disease Questionnaire (GERDQ). A GERDQ was administered weekly to monitor symptom changes. Patients who successfully discontinued their PPI will be administered a GERDQ at 1 month, 6 months, and 1 year post-study.

Results
This research is currently ongoing, however, we believe this study will highlight the difficulties patients face in discontinuing their PPI.

Conclusions
Additionally, we hope that this can serve as a foundation for future studies to solidify how providers can best counsel patients in tapering off of their PPI. The creation of standardized guidelines can prevent indefinite prescription of PPI therapy, therefore, reducing pill burden, financial strain due to medication cost, and potential adverse effects as a result of long-term PPI use.

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Scholars Fellowship Award

Abstract #10

Samuel Horkey

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Percutaneous Cholecystostomy

Background/Purpose
Percutaneous biliary interventions include percutaneous transhepatic cholangiography (PTC) and biliary drainage to manage benign and malignant obstruction and percutaneous cholecystostomy. While not the first line therapy, this is an important procedure for high-risk acute cholecystitis patients that are unable to undergo other treatments, such as cholecystectomy. The goal of this project is to retrospectively evaluate percutaneous cholecystostomy at a single institution and evaluate outcomes to include surgery, chronic tubes, or other therapy.

Methods
Following IRB approval, all adult patients (>18 years of age) diagnosed and/or treated for AC with PTC between 2/2016 and 10/2022 at a single institution were retrospectively evaluated. Typical demographic and clinicopathologic data were collected to include, but not be limited to, intra-procedural complications, post-procedural complications, mortality, recurrent cholecystitis, hospital LOS, ICU LOS, and readmission rates.

Results
Overall, 94 patients were retrospectively evaluated. Mean age was 71 (19-94) and mean BMI was 29.5 (14.1-56.7). Mean ASA was 3.16 with most patients ASA 3 or 4). Intra-procedural complications occurred in 1% of patients (n=1; technical success was achieved for 99% (n=93). Post-procedural complications (n=48) such as position change (n=28), pain at the site (n=15) and infection (n=10) were noted.

Conclusions
Percutaneous cholecystostomies have a high rate of technical success (99%) with low rates of intra-procedural complications (1%). While post-procedural complications have been noted to occur in 45% of patients, our cohort showed 51%; however, our recurrent cholecystitis rate was lower than reported (16% vs. 24%). Tube position change increased our post-procedural complication rate the most. At our institution, percutaneous cholecystostomies are rapid, easily performed surgeries with low intra-procedural complication rates, and high, but minor, post-procedural complication rates, allowing high-risk acute cholecystitis patients to be effectively managed.

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Abstract #82

Katherine Howey

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Harnessing Artificial Intelligence for TNM Staging Extraction from Electronic Health Records: A Note-by-Note Analysis in Prostate Cancer Documentation

Background/Purpose
The Tumor, Node, Metastasis (TNM) staging system is essential in oncology for informing prognosis and guiding treatment decisions. It is also a critical data metric for institutions seeking National Cancer Institute Community Oncology Research Program (NCORP) designation, granting access to advanced therapies and resources. However, documenting TNM staging is resource intensive, requiring detailed, manual logging of patient data. Artificial Intelligence (AI) offers a promising approach to enhance workflow efficiency by enabling automated data extraction from patient notes. This study evaluates the efficacy of an AI program in accurately identifying TNM staging through a note-by-note analysis of patient charts. It is an expansion of the pilot study which successfully demonstrated AI's capability at a broader chart level. Accurate analyses at both the note and chart levels are critical to support AI implementation. We hypothesized that this refined approach would increase analysis specificity.

Methods
The AI system analyzed Electronic Health Record (EHR) notes of 100 urology patients, including PSA values, digital rectal exams, MRI, biopsy, and pathology results. The algorithm extracted TNM staging, counting true positives as correctly identified staging in prostate cancer patients, true negatives when no staging was found as patients did not have cancer, false negatives when cancer was present but omitted from documentation, and false positives when staging was detected in patients without cancer.

Results
The AI evaluated 100 patients' notes (n=976) from prostate cancer workups, achieving a positive predictive value of 92.9%, a negative predictive value of 99.7%, sensitivity of 98.9%, and specificity of 98.2%.

Conclusions
Initial findings suggest that this AI program can accurately identify TNM staging from patient notes, showing promise in reducing manual extraction demands. Future research will increase this study to 300 additional patients, assessing its broader implications on workflow efficiency, NCORP-related certification, and expansive applications within medicine.

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Abstract #95

Kyle Jardim

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Intersection of Stress, Sex & Gender, and Coronary Artery Disease

Background/Purpose
Stress is a recognized risk factor for coronary artery disease (CAD) and myocardial infarction (MI). Differences in CAD/MI presentation between males and females are established; however, limited research explores the complex interplay between sex and CAD/MI in relation to lifestyle management. This study assesses the extent of research examining the Lifestyle Medicine pillar of stress management and its relation to CAD/MI outcomes across sex- and gender-specific contexts.

Methods
A literature review was conducted using a PubMed-based search tool developed by the Sex & Gender Specific Health Task Force and Program team at Texas Tech University to identify sex- and gender-specific health literature. Using this tool as a foundation, search terms were refined to include "coronary artery disease" or "myocardial infarction" with a focus on "psychological stress," "mental stress," or "emotional stress," to exclude terms associated with physiological stressors. Articles were screened for relevance to CAD/MI, Lifestyle Medicine, and specific stress factors.

Results
Searches using CAD/MI and sex/gender criteria yielded 69 results for "psychological stress," 35 for "mental stress," and 6 for "emotional stress." Many studies focused on stress effects in post-MI patients or women specifically, while very few explored the potential impact of stress or proper stress management on CAD development or protective benefits for MI between sexes or genders. This limited focus suggests a notable gap in Lifestyle Medicine research on preventive stress management for CAD/MI across sex and gender.

Conclusions
This review reveals a considerable gap in the literature regarding psychological stress and its role in CAD/MI development and prevention across sex and gender. Expanded research in this area could support earlier detection and management of CAD through Lifestyle Medicine approaches, offering new insights for proactive, patient-centered CAD care.

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Abstract #94

Kayla Beth Jernigan

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Addressing low osteoporosis screening rates in postmenopausal females younger than 65 years old

Background/Purpose

Current guidelines recommend universal osteoporosis screening with dual energy X-ray absorptiometry (DEXA) for females 65 years and older. However, many postmenopausal females develop osteoporosis before age 65, especially those with risk factors such as chronic corticosteroid use, family history of hip fracture, and previous non-traumatic fracture. Although the U.S. Preventive Services Task Force (USPSTF) recommends osteoporosis screening in females younger than 65 with increased risk factors, there is variability regarding risk factor criteria between different clinical assessment tools listed by USPSTF. This poses a challenge to implementing standard osteoporosis screening for postmenopausal females younger than 65, especially at our institution where electronic medical records do not identify a care gap until age 65. Within the resident internal medicine clinic at our institution, only 5.9% (14/236) female patients between the ages 50-64 with at least one osteoporosis risk factor had a DEXA ordered prior to our intervention.

Methods

To improve screening rates, we developed a questionnaire for targeted patient discussions for females aged 50-64, facilitated by a medical student researcher from June to August 2024. The responses to the questionnaire were used to calculate a Fracture Risk Assessment Tool (FRAX) score to aid in resident physician clinical judgment for ordering DEXA scans.

Results

After the intervention, 11.8% (28/236) female patients 50-64 years old with at least one risk factor had a DEXA ordered. Among the patients that completed a DEXA within the intervention period, 90% (18/20) had a T-score ≤ -1.0, indicating at least osteopenia, and 35% (7/20) had osteoporosis.

Conclusions

The intervention was effective at accurately identifying postmenopausal female patients at risk for osteoporosis based on DEXA results. Prioritizing preventative screenings is still a barrier within the clinic where patients have medical complexities. Further improvements in early osteoporosis screening utilization are still being investigated.

Student research funded by
Scholars Fellowship Award

Abstract #57

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Impact of the COVID-19 Pandemic on Emergency Department Utilization of Initial Fibrinolysis for the Treatment of ST-Segment Elevation Myocardial Infarction

Background/Purpose
Fibrinolysis is generally considered an alternative to percutaneous coronary intervention (PCI) for ST-Segment Elevation Myocardial Infarction (STEMI) when PCI is not immediately feasible. The COVID-19 pandemic may have impacted the timeliness of PCI. We sought to compare the rate of fibrinolysis use before and during the COVID-19 pandemic.

Methods
Methods: We identified adult patients presenting to US emergency Dept.s (EDs) for STEMI between 2018 and 2021 using a national ED database. The cohort was restricted to individuals receiving fibrinolysis. Patients were divided into two cohorts based on receipt of fibrinolysis during the pre-pandemic and pandemic time periods. The rate of fibrinolysis use was compared between cohorts.

Results
Results: We identified 3,293 STEMI ED encounters receiving fibrinolytic therapy either prior to (n=1,593) or during (n=1700) the pandemic, with rates of 24.5 and 28.2 per 1,000 STEMI encounters, respectively.

Conclusions
Conclusions: Fibrinolytic therapy use increased, but only slightly, during the COVID-19 pandemic. This suggests that the healthcare system adapted quickly to changes during the pandemic in the setting of STEMI treatment.

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Abstract #115

Tatiana Joseph

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A Comparative Exploration of Tools for Measuring Fc Receptor Expression on Human Sperm

Background/Purpose

According to the World Health Organization, about 1 in 6 people experience infertility at some point in their lives(WHO). Both male and female partners can contribute to infertility, but men are solely responsible in 20% of cases (NIH). Traditional fertility methods such as IVF can be expensive, timely, and cause emotional distress if not successful. More understanding on how to address factors impacting male infertility is needed. New methods that combine immunological knowledge of antibody receptor (FcR) expression with traditional semen analysis could bring to light a new understanding of male infertility, and possibly a way to increase fertility rates in those trying to conceive.

Methods

Human sperm samples were collected, treated with Fc block to prevent non-specific antibody binding, and stained with fluorescently tagged antibodies specific for distinct FcRs: CD16, CD32, CD64, CD89, FAIM3. After washing away unbound antibody, samples were then analyzed for fluorescence intensity relative to isotype controls using a Nanodrop 3300 and NxT Attune Flow cytometer. Nanodrop detects the presence of fluorescence within a whole sample, while flow cytometry measures the amount of fluorescent antibody on individual sperm cells.

Results

Our results showed that both Nanodrop and Flow Cytometry were both able to specifically detect the presence of FcR proteins on human sperm. Flow cytometry was able to produce more robust data. However, as far as ease of use and accessibility, nanodrop proved capable of producing similar results to flow cytometry while being more advantageous for everyday clinical assessment.

Conclusions

From a clinical standpoint, it is important to understand which method will be more efficient, accurate, and relevant in assisting patients with fertility struggles. Greater understanding of these methods will mean greater applications of these tools in clinical settings and better understanding of the significance of FcR expression on fertility outcomes.

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Abstract #68

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Investigating Aspergillus fumigatus Physiology in Polymicrobial Infections via Reverse Genetics

Background/Purpose

Aspergillus fumigatus is a widespread airborne fungal pathogen that poses significant health risks, especially in immunocompromised individuals. This study aims to investigate uncharacterized A. fumigatus genes with increased expression when A. fumigatus is placed in a polymicrobial environment in order to elucidate the physiological defense mechanisms of A. fumigatus.

Methods

Ninety-six genes were previously selected based on an RNA sequencing dataset and were knocked out to generate ninety-six distinct A. fumigatus mutant colonies, each with one of the ninety-six genes knocked out, to later be screened for survival deficits. PCR-based gene manipulation and transformation was utilized to create mutants with genes of interest replaced with Hygromycin B phosphotransferase (hph) cassettes, allowing for selection of mutants. Each mutant colony was confirmed through PCR and screened for survival deficits by being grown in Pseudomonas supernatant, Congo Red, Amphotericin B, Hydrogen Peroxide, and Itraconazole.

Results

The generation of fifty A. fumigatus colonies was verified through PCR and gel electrophoresis, with each colony having a distinct gene of interest replaced with a hygromycin resistance gene. Forty-six colonies were unable to be generated due to the high-throughput nature of the experiment. The screening process is currently underway with some mutants already displaying promising survival deficits to certain screening elements compared to controls indicating the genes' possible role in defense or survival mechanisms.

Conclusions

This study illuminates the genes A. fumigatus utilizes in polymicrobial environments and aims to determine if these genes play a role in survival. Future research will involve re-insertion of the gene, localization of the gene through fluorescent tagging, and manipulating each gene's regulation to better narrow each gene's specific role in enhancing pathogenicity. Ostensibly, understanding the function of these uncharacterized genes may lead to novel therapeutic targets for managing resistant A. fumigatus infection in immunocompromised patient populations.

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Clemson MEnTOR program (NIH T35AI134643, PI K. Smith)

Abstract #100

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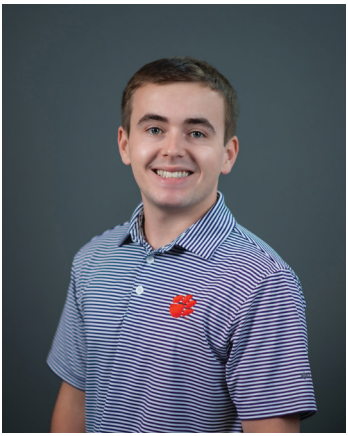
The importance of person-to-person interaction in promoting conversation and engagement with vaccine information within the community

Background/Purpose
Often person-to-person interaction is overlooked when addressing controversial topics. In this study, a vaccine information table was implemented at a monthly medical student-led health fair in Greenville, South Carolina, to better understand how community members engage with medically informed individuals, namely medical students, at an individual level regarding the controversial topic of vaccine education and information.

Methods
Data collection took place between April and October of 2022 at a monthly health fair event. Medical student and faculty volunteers who were present to answer questions or engage in conversation depending on community member preference. For every individual who engaged with the table, the type of interaction and participant tone were recorded on a data collection sheet by a member of the study team serving as an observer. Specific comments, questions, and common themes were recorded as well.

Results
A total of 35 health fair attendees chose to engage with the vaccine information table, representing 31.6% of the total attendance at Root Cause. Of these individuals, 33 of 35 interacted by asking a question, telling a personal anecdote, and/or taking a flyer, with question-asking being the most common mode of interaction. Side effects were the most discussed topic when participants chose to share a personal anecdote. Slightly more than half of interactions (51.4%) were neutral, while 48.6% were positive in nature, with no reported negative engagement.

Conclusions
The overall neutral to positive tone and varied types of interactions observed in this study demonstrate a willingness within the community to engage with vaccine information in a health fair setting. Question-asking seemed to be a major source of interaction initiation pointing to participant's willingness to know more about vaccines. Side effects appear to be the major source of anecdotal information indicating this to be the major theme of discussion. This study highlights the importance of personal individualized interaction as well as the value in medical-student guided interaction and discussion regarding vaccine information and how it can be promoted through medical student-led community health initiatives.



Abstract #70

Garrett Kaufman

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Functional roles of afu-182 in azole response and pathobiology of Aspergillus fumigatus

Background/Purpose

Aspergillus fumigatus is an opportunistic fungal pathogen that causes various pathologies, notably invasive aspergillosis, which has the highest healthcare cost burden of any fungal disease in the United States. According to the CDC, approximately 19% of these infections demonstrate resistance to first-line therapies, namely azole drugs. Previous studies have implicated non-coding RNA expression in A. fumigatus as a potential mechanism for handling environmental stressors. Preliminary experiments conducted in our lab demonstrated a negative correlation between environmental temperature and the level of the non-coding RNA afu-182 expression. Our research seeks to further explore this relationship and its impact on A. fumigatus azole tolerance.

Methods

The CEA-10 strain of A. fumigatus was cultured at 42°C for 48 hours, then spores and mycelia were harvested. This process was repeated for 12 generations. Samples were also collected from CEA-10 and Generation 12 cultured at 37°C. RNA was extracted from mycelia and underwent DNAse treatment and cDNA synthesis. Levels of afu-182 expression were measured using qPCR. Phenotypic assays with voriconazole were performed utilizing spores from each generation.

Results

There was a significant ($p<0.001$) decrease in afu-182 expression from unadapted CEA-10 grown at 37°C to Generation 12 grown at 42°C. CEA-10 grown at 42°C had levels of afu-182 expression that were not significantly different from Generation 12. Notably, when spores from Generation 12 were cultured at 37°C, afu-182 expression did not recover to baseline levels. Phenotypic assays demonstrated that later generations exhibited better growth above MIC compared to CEA-10.

Conclusions

These findings indicate that changes in afu-182 expression may be adaptive and lead to higher levels of azole drug tolerance. As global temperatures rise, it may be possible for environmental strains of A. fumigatus to express lower levels of afu-182, potentially leading to a higher incidence of azole-tolerant infection and mortality.

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Abstract #67

Ronnie Keel

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The Impact of Community-based Adaptive Sports on Depression and Quality of Life in Persons with Disabilities

Background/Purpose

To examine the effects of hospital-sponsored, adaptive sports programs (Cycling, Pickleball, Yoga) in persons with disabilities on quality of life (QOL) and depression as compared to prior to their participation.

Methods

A within subjects' design was used for this pilot prospective study. Participants with disabilities participated in the adaptive sports program. Participants could either be novel to the sport or have participated previously and underwent a washout period of ≥8 months. Before and after program participation, participants completed a modified Short Form-36 (SF-36) and Center for Epidemiological Studies Depression Scale (CES-D) via Redcap surveys, to assess changes in QOL and depression scores, respectively. Outcome data were analyzed using inferential statistics, including paired sample t-tests of both surveys. All results were reported as medians and interquartile range (α=0.05).

Results

Twelve participants completed the pre/post-intervention surveys and at least one sport (Pickleball=5, Cycling=12, Yoga=3). Non-significant ($p>0.05$) but potentially clinically meaningful trends were observed for improvements in physical functioning (20%), as well as role limitations due to physical (26%) health. Levels of depression were observed to increase (20%). Interestingly, energy/fatigue decreased (3%), pain increased (13.6%), and emotional well-being increased (16%).

Conclusions

This study offers preliminary insights into the clinical relevance of adaptive sports in changes in quality of life and depression in people with disabilities. It is possible that adaptive sports may improve physical functioning but also may increase pain and fatigue. Larger sample sizes are needed to determine whether these changes are statistically significant. Additionally, qualitative data would provide deeper understanding into the observed contradictions of quality of life domains related to participating in adaptive sports. Community adaptive sports may have the potential to be valuable in some areas for innovative rehabilitation care.

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Abstract #116

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Exploring Motivation and Barriers in Weight Loss Adherence

Background/Purpose
Obesity is a significant public health issue affecting over 42% of U.S. adults and is linked to various comorbidities, including cardiovascular disease, type 2 diabetes, and mental health challenges. Research emphasizes that motivation plays a vital role in weight management success, especially as patients face barriers such as limited access to healthy foods and social support deficits. This study aims to explore how baseline health metrics, motivation levels, and barriers impact engagement in a structured weight loss intervention.

Methods
Targeting individuals with a BMI ≥ 30, participants are recruited using a guide that evaluates motivation and potential barriers. Upon enrollment, participants complete the Dietary Screener Questionnaire (DSQ) and Weight Control Strategies Scale (WCSS) to document dietary habits and weight control behaviors. They then receive dietary counseling from nutrition students and medical counseling from resident physicians, with baseline biometric and lab data collected (e.g., metabolic panel, lipid panel, A1c).

Results
We anticipate that participants motivated by personal health goals and supported by strong social networks will demonstrate greater adherence and more consistent behavior changes. Conversely, barriers like limited food access, time constraints, and financial challenges may impede engagement. Support resources, including cooking classes and dietary guidance, are expected to enhance adherence and foster sustainable lifestyle changes.

Conclusions
This study will provide valuable insights into the importance of individualized strategies in weight loss programs by emphasizing motivation and barrier identification. Findings are expected to inform the design of future interventions that address specific patient needs, supporting sustained success in weight management. By identifying factors that influence adherence, this research aims to contribute to the development of tailored approaches that enhance long-term engagement and effectiveness in clinical weight loss programs, ultimately contributing to broader public health efforts to reduce obesity rates.

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Abstract #14

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GRASP Dynamic Contrast Enhanced MRI Can Be Used to Monitor Response to Stereotactic Radiosurgery in Head and Neck Paragangliomas

Background/Purpose
GRASP MRI (Golden-angle Radial Sparse Parallel MRI) is an advanced imaging method utilizing radial sampling and compressed sensing for high-resolution imaging with improved temporal resolution and motion robustness. Its benefits include reduced scan times, enhanced image quality, and flexibility in retrospective reconstruction, making it ideal for dynamic and real-time imaging. Paragangliomas (PGLs) are hypervascular neuroendocrine tumors arising from paraganglia. A prior study demonstrated GRASP MRI's ability to differentiate head and neck paragangliomas from schwannomas, with paragangliomas showing rapid wash-in, washout, and higher peak signal intensities compared to schwannomas. Stereotactic radiosurgery is a common treatment for jugular foramen and skull base PGLs. Post-treatment, PGLs may slightly decrease in size but not significantly in volume. This study aimed to assess longitudinal GRASP MRI's ability to track perfusion changes in PGLs after radiosurgery. The hypothesis was that irradiated PGLs would show quantitative differences in enhancement on dynamic GRASP imaging pre- and post-radiation.

Methods
This retrospective study, approved by the institutional review board, included 7 patients with head and neck PGLs treated with gamma knife radiosurgery from 2015 to 2024. Patients underwent GRASP MRI before and at least once after treatment, with a mean follow-up period of 39 months (range 7-71 months). Elliptical regions of interest (ROIs) were drawn in the tumor and control ROIs in the superior sagittal sinus. Signal-time curves from each ROI were analyzed, and wash-in and washout slopes were normalized to the superior sagittal sinus. Mean slopes were compared between pre- and post-radiation groups using a one-tailed paired T-test ($P < .05$).

Results
After radiation, wash-in slope ratios significantly decreased on follow-up scans ($P < .05$). No significant differences were found in the post-radiosurgery washout slope.

Conclusions
GRASP MRI can evaluate post-radiosurgery changes in head and neck PGLs.

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Abstract #23

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Robotic extended-view totally extraperitoneal ventral hernia repair: Single-center experience with 2-year follow-up

Background/Purpose
Enhanced-view totally extraperitoneal (eTEP) robotic ventral hernia repair (VHR) is an advanced approach that improves upon inguinal and robotic retromuscular repair techniques. By directly accessing the retrorectus space, eTEP facilitates a Rives-Stoppa repair in a minimally invasive manner, allowing step-wise myofascial release with transversus abdominis release (TAR) only if necessary. This approach enables abdominal wall reconstruction (AWR) with wide mesh reinforcement while minimizing wound morbidity and supporting rapid recovery. This study reports outcomes from the largest robotic eTEP VHR series to date.

Methods
This retrospective review included all robotic eTEP cases from October 2017 to March 2023. Data on patient demographics, hernia specifics, operative details, and 30-day outcomes (2017-2020) were collected from the Abdominal Core Health Quality Collaborative (ACHQC). Further chart review provided data on eTEP approach type and long-term follow-up through physical exams, imaging, or surgeon entries. The study was IRB-approved and follows STROBE guidelines.

Results
A total of 380 eTEP VHR procedures were performed, with 31.8% on recurrent hernias. The top-down approach was most common (79.5%). The average defect size was 7.6 cm wide by 13.2 cm long. TAR was used in 29.7% of cases, achieving closure in 99.5% overall. Average operative time was 202.4 minutes, with a mean hospital stay of 1.02 days. Surgical site infection (SSI) occurred in 1.3% of patients, and 48.7% experienced surgical site occurrences (SSOs), predominantly seromas, of which 5.5% required intervention. Recurrence rate was 4.2%, with trocar site hernias in 1.6% of patients after a mean follow-up of 28.3 months.

Conclusions
Robotic eTEP VHR offers a customizable repair that merges the strengths of open AWR with minimally invasive benefits, including reduced wound morbidity and shorter hospital stays.

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Abstract #90

John Kurtz

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AI Decision Support Tool for Detecting Stressful Events and Characterizing Neurological Biomarkers to Understand Burnout in Emergency Physicians

Background/Purpose

Burnout as a syndrome is defined as a combination of emotional exhaustion, depersonalization, and a sense of reduced personal accomplishment. The increasing prevalence of burnout amongst physicians is well documented, with workplace-related factors and unstable or stressful environments contributing significantly. Physicians at the front line of care access (including ED and critical care physicians) have the greatest risk of burnout, and ED physicians experience acute subjective and physiologic stress while working clinically. Perhaps more alarming is the correlation of increased burnout with increased rates of physician involvement in patient safety incidents, leading to suboptimal care and costing healthcare systems billions annually. These realities underscore a need for developing preventative measures and tools that identify evidence of potential burnout in physicians before further progression of symptoms.

Methods

We previously hypothesized that adding Artificial Intelligence (AI) data-driven decision support using a prototype portable EEG device may aid in detecting early signs of trauma-related neurological disorders by identifying and characterizing potential biomarkers associated with acute stress. Results from implementing this device showed that traumatic events can be characterized based on personalized calculated thresholds. This study aims to build off this data to create a second prototype device that continuously monitors physiological biomarkers for stress-related symptoms using AI, EEG, and heart rate variability (HRV). This will be worn by physicians in the ED at Prisma Health Greenville Memorial Hospital.

Results

Data collection on site is currently awaiting IRB approval.

Conclusions

We expect the results from on-site data collection to provide further insight into the use of physiologic biomarkers in aiding the detection of preliminary signs of burnout. Additionally, developing a Shiny application to detect stress-related events using AI will give additional insight into the neurological stress that physicians experience on a daily basis and allow physicians to be alerted when burnout is likely to occur.

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Abstract #43

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Supervised machine learning and predictive analytics to determine the optimal allocation of resources for pediatric surgical patients in the United States - A pilot project

Background/Purpose
Medically underserved children in the United States face critical challenges accessing pediatric subspecialty care due to the uneven geographical distribution of specialized providers. Despite increased efforts by governmental organizations and national surgical associations to address these disparities, more than 10 million children live over 60 miles from the nearest pediatric surgeon. While the Right Child, Right Surgeon Initiative (RCRS) seeks to promote equitable access to pediatric subspecialty care, the broader effects of this uneven distribution on health outcomes remain unclear.

Methods
This study examines the distribution of fellowship-trained pediatric gynecologists relative to African American female patients, ages 0 to 21. Using census data and information from the North American Society for Pediatric and Adolescent Gynecology (NASPAG), we compared physician-to-patient ratios by zip code for 2020 and 2024.

Results
Results reveal a stark shortage nationwide, with ratios reaching 110,080:1 in South Carolina (Figure 2). Physician numbers and distribution showed no significant change between 2020 and 2024, and most pediatric gynecologists were concentrated in urban areas, often over 100 miles from their patient populations (Figures 2, 4).

Conclusions
These findings underscore an ongoing shortage and geographic imbalance in pediatric gynecology. Despite initiatives like RCRS, little progress has been made to improve distribution, indicating a need for further research on pediatric subspecialty access for diverse patient demographics across the country.

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Abstract #1

Sydny Long

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Examining the benefits of a medical education-focused clinical anatomy elective for fourth-year medical students

Background/Purpose
Training fourth-year medical students to teach and write exam questions for first-year medical students better prepares the former for future clinical instruction experiences and provides the latter with more diverse, clinically-relevant questions on summative examinations.

Methods
At the USC School of Medicine Greenville (USCSOMG), we provided an elective rotation to fourth-year clinical medical students (M4s) that involved teaching anatomy to first-year students in the dissection lab and writing summative exam questions for these students under the guidance of anatomy faculty. M4s wrote, edited, and contributed questions to eight exams administered to first-year students over the course of their anatomy module for the academic years of 2021-2022 and 2022-2023. Test items were analyzed to determine difficulty, discrimination index, and point biserial with the purpose of assessing question integrity. For each exam, the means of these three values were compared between questions written by anatomy faculty and for those written by M4s.

Conclusions
For the most part, there was no significant difference in any of the eight exams' test item measures between faculty and M4s. These results may be due to the respective strengths that both groups bring to the question-writing experience; advanced knowledge of the content and experience with writing exam questions in the faculty, and familiarity with clinical application of content in the M4s. Based on these results, we recommend that fourth-year medical students receive further opportunities to teach content to and write exam questions for first-year medical students to create a more well-rounded, clinically-relevant curriculum and enhance the educational repertoire of early-career doctors.

Abstract #107

Julia Lunt

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The Impact of High Value Care Education on First Year Medical Students

Background/Purpose
Previous studies have investigated the importance of High Value Care (HVC) education in the medical school curriculum; however, our study focuses on the improvement in HVC knowledge after one lecture and evaluation of how students would incorporate HVC into their future practice. The aim of this study is to assess the impact of HVC education in the medical school curriculum.

Methods
First year medical students at USC School of Medicine Greenville took a HVC pre-survey to assess HVC knowledge prior to an HVC lecture and a post-survey to assess knowledge acquired from the lecture. Both qualitative and quantitative data was collected and input into RedCap.

Results
Quantitative data analysis shows improvement in 3 out of 4 multiple choice questions assessing HVC principles after students attended lecture. Question 1 ("What percentage of total US healthcare spending is associated with medical waste?") showed the greatest improvement with 49.5% of students answering correctly on the pre-survey vs. 84.9% answering correctly on the post-survey. Qualitative data analysis shows an expansion of understanding of what HVC means, the role of physicians in implementing HVC into practice, and how the students, as future providers, would incorporate HVC into their practice. After lecture, common themes of how they would incorporate HVC into their practice include: utilizing shared decision making, ensuring cost effectiveness, being mindful of tests ordered, being a good steward of resources, and establishing closer relationships with patients to better understand theirs needs.

Conclusions
The data collected suggests the benefit of early HVC education in medical schools and the importance of having students reflect on how they will become HVC providers. More specifically, providing a HVC lecture to M1 students at USC-SOMG improved their HVC knowledge in 3/4 multiple choice questions and expanded qualitative responses to open-ended questions when comparing pre-survey to post-survey.

Abstract #40

Megan McFarland

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Non-Traumatic Rhabdomyolysis in the Setting of COVID-19 Infection

Background/Purpose
We present a 31-year-old male in SC with multiple sclerosis receiving ocrelizumab infusions every six months, not vaccinated against COVID-19, with COVID-19 infection complicated by non-traumatic rhabdomyolysis and transaminitis. This patient tested positive for COVID-19 seven days before admission. Primary care provider (PCP) evaluation the prior day revealed elevated liver function tests (LFTs). PCP sent patient to the emergency Dept. for elevated LFTs and dark urine.

Methods
Differential diagnoses included COVID-induced myositis resulting in rhabdomyolysis, immunotherapy-induced hepatitis, viral hepatitis, drug intoxication, or mononucleosis.

Results
Labs showed immeasurably high creatinine kinase (CK), elevated LFTs, and urinalysis suggestive of myoglobinuria (Table 1). Laboratory studies ruled out Hepatitis A-C, Epstein-Barr virus, and acetaminophen overdose. Ultrasound of right upper quadrant and CT abdomen/pelvis without contrast revealed no acute abnormalities. Two liters intravenous Lactated Ringer's bolus followed by 150 mL/hr, titrated to 100 mL/hr over his 6-day hospital course resulted in downtrending CK.

Conclusions
Viral etiology should be considered for rhabdomyolysis without antecedent trauma. Prompt intravenous fluid resuscitation in this patient improved labs. COVID-19 infection causing myalgias may warrant CK testing.

Abstract #36

Gina McKay

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Impact of Social Determinates of Health on Access to Private Duty Nursing Services for Children with Tracheostomy tubes in South Carolina Communities

Background/Purpose

Securing private duty nursing (PDN) remains challenging for children with medical complexity (CMC). Without an in-home nurse, family members assume caregiving responsibilities 24 hours a day, often sacrificing employment and time to rest. Despite access to financial support from Medicaid and studies showing improved outcomes with PDN services, many pediatric patients with tracheostomy tubes are without private duty nurses. More research is needed on what factors impact insufficient private duty nursing.

Methods

This study sought to assess the association between socioeconomic status (SES) from census tract/block data and the ability to obtain in-home private duty nursing. 25 caregivers of pediatric patients with tracheostomy tubes were recruited from Prisma Health's two pediatric complex care clinics, providing coverage for patients across two-thirds of South Carolina. Patient demographic and medical information was obtained through the Electronic Medical Record (EMR) and Child Opportunity Index (COI) determined as a marker of SES. A patient's caregiver completed a telephone survey regarding accessibility of PDN for their tracheostomy-dependent child over a 12-month period.

Results

25 respondents completed the surveys, each of which had a tracheostomy-dependent child. Patients were stratified based on their accessibility to PDN. Notably, 64% (16/25) of respondents reported poor access to PDN services including no or poor access to PDN services for which they qualify. A slight correlation was noted between having a lower COI and having improved PDN services available.

Conclusions

Despite qualifying for nursing services, most children with tracheostomy tubes were unable to access adequate PDN services. A small correlation was seen that families residing in neighborhoods with low COI have improved access to PDN services. More research is needed to determine factors contributing to this trend. A larger study including family input may provide more insight into barriers families face when seeking PDN services to support CMC and their substantial care needs.

Abstract #117

Aahil Merchant

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Isolation and Differentiation of SVF Derived Adipocytes in a Murine Model of Insulin Mediated Pseudoacromegaly

Background/Purpose
Insulin mediated pseudoacromegaly (IMPA) is a rare insulin resistance syndrome characterized by acromegalic features. Patients with IMPA have extremely elevated insulin levels and normal growth hormone and IGF-1 levels. Our lab previously demonstrated that this condition may be linked to pathogenic variants in the FGF21 signaling pathway (FGFR1 and KLB). These genes play a key role in adipocyte insulin sensitivity. Our lab previously used induced pluripotent stem cell (iPSC) derived adipocytes to demonstrate adipocyte dysfunction associated with IMPA; however, the iPSC model was labor-intensive and expensive. Our objective was to derive adipocytes from the stromal vascular fraction (SVF) of a newly developed murine model of IMPA. We hypothesized that these adipocytes would provide similar results, in a relatively rapid and cost-efficient manner.

Methods
Inguinal white adipose tissue was collected from 6 to 8-week-old wildtype and mutant mice, and the tissue was digested and centrifuged to isolate the SVF. SVF cells were grown on media conducive to pre-adipocyte growth until 90% confluent for 3 passages. Subsequently, pre-adipocyte differentiation to adipocytes was induced via a media encouraging adipogenesis, and media was changed every other day for 10 days.

Results
At day 8 of the differentiation process, suspected adipocytes with lipid droplets became visible via microscopy. However, on day 9, large breaks in the cell monolayer were observed, and subsequently wide-scale cell death prevented successful further differentiation of adipocytes.

Conclusions
While unsuccessful at differentiating adipocytes, we obtained some promising signs regarding the feasibility of obtaining SVF derived adipocytes from our mouse model of IMPA. SVF-derived adipocytes may provide a cost-efficient and more rapid alternative to iPSC derived adipocytes. Future experimentation should involve protocol adjustments to improve differentiation efficiency and cell viability, including collecting tissue from younger mice and coating the cell culture plates. These efforts could reveal important information about the implications of this rare disease.

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Abstract #20

Lily Moore

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Influence of the Six Pillars of Lifestyle Medicine on Breast Cancer with Consideration of Sex and Gender: A Systematic Review

Background/Purpose
Lifestyle medicine is a medical specialty that uses therapeutic lifestyle interventions as a primary modality to treat chronic conditions. These interventions fall under six pillars: nutrition, exercise, restorative sleep, positive social connections, avoiding risky substances, and stress management. Increasing data suggests these six pillars influence patient outcomes in various disease states, such as breast cancer. This systematic review examines whether current scientific research sufficiently addresses the appropriate preventative and treatment measures for reducing breast cancer risk, morbidity, and mortality relative to sex and gender.

Methods
A comprehensive search was performed using PubMed to identify sex and gender-specific health literature regarding breast cancer and the six pillars of lifestyle medicine. Keywords in the search included but are not limited to “diet”, “exercise”, “physical activity”, “sleep”, “substance use”, and “stress”.

Results
Using the sex and gender-specific PubMed search tool, 37 total articles were published between 1995 and 2024 regarding physical activity (22) and exercise (15) interventions for breast cancer patients. 16 articles were published between 1987 and 2017 regarding dietary interventions for breast cancer patients. There were less than 5 articles published under topics relating to the lifestyle medicine pillars of avoidance of risky substances, restorative sleep, stress management, and social connection.

Conclusions
While breast cancer research is extensive, the vast majority of research is not related to preventative and treatment modalities relating to the six pillars of lifestyle medicine. Studies also almost exclusively focus on postmenopausal female subjects. Minimal research exists on breast cancer cases in premenopausal females, males, and non-binary patients. Given higher mortality rates for male versus female breast cancer patients, and the rising incidence of breast cancer in premenopausal females, the scientific community would benefit from incorporating sex and gender differences in explorations of the effects of lifestyle medicine pillars.

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Abstract #27

Samantha Morales

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Efficacy and Cost Effectiveness of Trigger Finger Management and its Relation to A1c Levels

Background/Purpose

Stenosing tenosynovitis, typically managed nonoperatively via corticosteroid injection, is a common condition involving the inflammation, thickening, and subsequent triggering of the flexor sheath, A1 pulley, and volar plate. While typically idiopathic, patients with diabetes mellitus are known to have a higher prevalence, lower success rates with non-operative treatment, and increased treatment failure rates with higher A1c levels. This study aims to investigate the efficacy of corticosteroid injections and surgery to treat trigger finger in diabetic populations, stratified by hemoglobin A1c levels. This data will be used to evaluate the most appropriate and cost-effective treatment algorithms based on A1c level.

Methods

CPT code query was used to identify diabetic patients who presented to Prisma orthopedic hand surgeons for stenosing tenosynovitis from March 2016-2020. Inclusion criteria, screened via RedCap, included being 18+ years old, diagnosis of both diabetes mellitus and stenosing tenosynovitis, and treatment via corticosteroid injections, surgical release, or both. Patient records were reviewed to collect data about treatment, comorbidities, A1c levels, and outcomes. Descriptive statistics were reported, and logistic regression was used to quantify the impact of A1c levels on injection success rates.

Results

Out of 222 patients, 63.3% had success with injections alone, while 36.7% eventually required surgery. Those who required surgery had higher average A1c levels (8.1 vs 7.46). Logistic regression showed that for every 1 unit increase in A1c, the odds of injection success decreased by 20%. ROC curve analysis suggests an injection success threshold A1c of 7.14.

Conclusions

Thus far, our results affirm that increased hemoglobin A1c levels can be tied to reduced success in treatment of trigger finger with corticosteroid injections alone. Immediate surgical release is likely more cost-effective in patients with an A1c above 7.14, but analysis on cost effectiveness stratified by A1c level is forthcoming.

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Abstract #73

Luke Morcos

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Establishing a PPI Deprescription Algorithm

Background/Purpose

The aim of this project was to establish the most effective protocol for patients to discontinue daily proton pump inhibitor (PPI) usage when no longer indicated. This would help to reduce the financial burden, adverse effects associated with chronic PPI use, and pill burden in populations taking numerous medications. This involved protocol directed at mitigating the symptoms of rebound reflux associated with this class of medications and other symptoms of gastroesophageal reflux disease.

Methods

Established patients of the Greenville Prisma Continuity clinic known to be on long term PPI prescriptions were randomly preassigned to one of 4 different treatment protocols. Patients were enrolled over the phone and were given baseline assessment with validated surveys GERDQ and RESQ7. Patients were then called weekly and resurveyed for 4 weeks. Trial success was based on both mitigation of rebound symptoms during the 4-week trial period as well as long term discontinuation after later follow up.

Results

Ultimately, not enough patients were enrolled and completed the trial to draw any significant results regarding which treatment group was most effective. 12 patients were successfully able to complete the protocol period. This highlights the difficulty in discontinuing this class of medication as patients were understandably either reluctant to attempt or complete discontinuation.

Conclusions

While this project failed to establish a dominant discontinuation algorithm for patients with chronic PPI use, it does stress the importance of providers reviewing the necessity of PPI continuation. PPI discontinuation when no longer indicated, while difficult, will help alleviate financial and iatrogenic burden on patients. Further study should be done to help identify the optimal approach to PPI discontinuation.

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Abstract #120

Katherine Morgan

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Alertness, Effort Perception, and Performance: A Case Study

Background/Purpose

Developing efficient strategies to improve physical and cognitive performance is a universal, timeless mission. This case study examines the application of a tool to support this goal by addressing the following inquiries: Does perception of effort significantly influence exercise performance? Can sleep metrics, such as alertness, quality of sleep, and length of sleep, calculated by the ReadiWatch hardware predict effort perception and performance? This project, focusing on exercise performance, was conducted as a precursor to an emergency medicine resident fatigue study using the same ReadiWatch device. Outcomes from this case study will exemplify how the ReadiWatch may be used to minimize perception of effort to aid in higher performance.

Methods

A ReadiWatch was worn for three consecutive weeks to gather sleep metrics. Exercise involved running an average of 40 miles each of these weeks. The ReadiOne data analysis platform, Strava, and Apple Watch were utilized to aggregate data.

Results

A total of 18 runs and the preceding night of sleep were analyzed. Length of runs ranged between 2.36 – 13.25 miles, with the majority being >10 miles. Distance alone was not a strong predictor of relative effort or perceived exertion. Relative effort and perceived exertion appear highly correlated ($R^2 = 0.83$). Both perceived exertion and relative effort appear highly determined by average alertness ($R^2 = 0.33$ and $R^2 = 0.46$, respectively).

Conclusions

The literature examines the consequences of four+ hours of sleep deprivation in a single night on perception of effort. However, this demonstrates a gap in understanding the impact of minimal changes in sleep hours on perception of effort over a longer duration, i.e. multiple weeks. This study explores the impact of more nuanced, day-to-day changes in sleep on perceptions of effort and fatigue with the intention of generating insight that can be applied to evaluating clinical readiness.

Student research funded by
Scholars Fellowship Award

Abstract #42

Jakayla Moses

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Exploring targeted mass spectrometry use with conditioned media from IVF-embryos as a screening tool for apoptotic protein presence

Background/Purpose

Assisted Reproductive Technologies (ART) are methods used to treat infertility, with one common type being in vitro fertilization (IVF). According to the CDC, the success rate for IVF was around 27% in 2021. This rate depends on various factors, such as the mother's age and the morphology and ploidy status of the implanted embryo. This study aims to enhance IVF embryo implantation by identifying apoptotic proteins in blastocoel fluid-conditioned media from aneuploid and euploid IVF-embryos using mass spectrometry.

Methods

Blastocoel fluid-conditioned media was collected from day 5 IVF-embryos following PGT-A. Samples were pooled based on ploidy status. Albumin in samples was removed prior to protein concentration. In-solution trypsin digestion was performed prior to separation via Dionex UltiMate 3000 nano-flow liquid chromatograph using a C-18 reverse phase capillary column and a standard acetonitrile/water gradient. The column is interfaced to a Thermo Q-Exactive quadrupole-orbitrap mass spectrometer by an integral nanospray tip. Analysis of peptides was done by tandem mass spectrometry (LC-MS/MS) using high resolution of the fragment ions.

Results

Preliminary mass spectrometry of samples identified the TEK/TIE2 protein, unique to media from euploid embryos and absent in media from aneuploid embryos along with peptides from 19 different proteins.

Conclusions

Using mass spectrometry, this study reports the preliminary identification of a receptor tyrosine kinase, TEK/TIE2, that plays a role in the development of the vascular system. Ongoing studies are utilizing targeted mass spectrometry to assess proteins in media from euploid embryos with known implantation status to identify potential biomarkers of implantation outcomes.

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Abstract #124

Alicia Moylan

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Addressing Lifestyle Medicine Components of the Female Athlete Triad: Expanding the Definition for Sex and Gender

Background/Purpose
The female athlete triad is a condition characterized by menstrual dysfunction, decreased bone mineral density, and low energy due to nutritional imbalance, with or without an eating disorder. This condition is commonly seen in young female athletes participating in high-intensity sports. Current research centers around balancing dietary intake with energy expenditure and forms of exercise that improve bone health, in biological females. This review aims to assess the literature for preventative and surveillance factors within the pillars of lifestyle medicine as well as considerations of an analogous condition in biological males and transgender individuals with the expansion of athletics.

Methods
A systematic search was performed in PubMed using the Sex and Gender Specific Search Tool developed by Texas Tech University for literature published through July 2024. Data was filtered using search terms relating to the female athlete triad, sex- and gender-differences, nutrition, physical activity, stress management, risky substances, sleep, social connection. Results were screened, and relevant studies were selected for further analysis.

Results
Broadly, 35 articles related the female athlete triad to sex and gender. When narrowed under the pillars of lifestyle medicine, there were 6 results concerned with nutrition, 17 regarding physical activity, 1 each for sleep and social connection, and zero for stress management and avoidance of risky substances. The nutrition and sleep studies did not address specific diets or sleep patterns, but rather their role in overall energy availability predominantly in females. Several articles discussing physical activity identified how elements of the triad increased risk for specific injuries, including consideration for males.

Conclusions
Numerous studies illustrate the impact of physical activity and nutrition in the development of the female athlete triad and future sequelae. Further research is needed to establish clearer evidence-based dietary and exercise guidelines for similar conditions in males and transgender individuals.

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Abstract #8

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Pre-hospital Bacterial Resistance Surveillance in Greenville, SC, USA

Background/Purpose

The rise of hospital-acquired infections, particularly those with antibiotic resistance, has increasingly become a concern for the medical community around the world. While hospitals have surveillance protocols in place for pathogens, many hospital systems do not routinely monitor for the presence of antibiotic-resistant microbes in patient transport vehicles. Ambulances could be a potential harbor and infection source for these dangerous infections. Specifically, ambulances performing hospital-to-hospital transfers and hospital-to-home transfers may serve as a route for the spread of antibiotic-resistant bacteria, due to the high rate of antibiotic-resistant bacteria found in hospitals3. Furthermore, while ambulance cleaning protocols are intended to destroy microbial contamination, some pathogens may be equipped to survive the decontamination process and be more likely to contribute to subsequent provider and patient infections. To determine the potential for ambulance-acquired antibiotic-resistant infection, Prisma Health ambulances were tested for the presence of bacteria and samples were subjected to antibacterial susceptibility testing.

Methods

A two-inch square area was sampled with a sterile wet-swab for 15 seconds, then stored in transport media and plated the same day. Initial testing of total bacterial load in multiple sites within ambulances identified target sites for more in-depth analysis. Total colony forming units, Methicillin resistance, Carbapenem resistance, and extended-spectrum beta-lactamase production were evaluated for each of the targeted swab sites with samples taken before and after ambulance cleaning where appropriate.

Results

The study found that cleaning significantly decreases bacterial presence, but there is no significance difference between antibiotic-resistant bacteria before and after cleaning. The most common antibiotic-resistant bacteria found in Prisma ambulances was MRSA, but carbapenem- resistant and ESBL-producing bacteria were found on the floors.

Conclusions

In conclusion, the presence and transfer of pathogenic bacteria in Ambulances is a threat to our healthcare system, and further evaluation and research of infection-prevention protocols should be considered to reduce the spread of these harmful bacteria.

Student research funded by
Scholars Fellowship Award

Abstract #108

Kenny Nguyen

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Enhancing Systematic Review Efficiency with Artificial Intelligence: Developing a Severity Scoring Tool for Pediatric RSV

Background/Purpose
Respiratory Syncytial Virus (RSV) remains a leading cause of respiratory illness in children under five, often leading to severe outcomes. Despite the existence of scoring tools for infection severity, they lack standardization, limiting their utility in clinical settings. This study compares the efficiency and consistency of artificial intelligence (AI)-assisted and manual screening methods in developing a standardized severity scoring system for pediatric RSV.

Methods
A systematic review of severity scoring tools for RSV was conducted using Rayyan AI, screening 5,663 articles from a pool of over 19,000 studies. The inclusion process also utilized AI to streamline screening, ensuring consistency and efficiency, and enhancing focus on high-yield studies that meet specific criteria. Through rigorous inclusion criteria and AI-assisted screening, 32 articles were selected, each contributing key clinical parameters relevant to RSV severity assessment, such as oxygenation levels, respiratory effort, and mechanical ventilation.

Results
Analysis of the selected studies indicates common themes in severity assessment, with oxygenation levels, respiratory rate, and other clinical signs emerging as consistent indicators of RSV severity. Additionally, parameters such as ventilation requirements, length of hospitallization, and use of intensive care support were frequently utilized across studies to differentiate mild from severe cases. The AI-assisted review process reduced screening time, enhancing accuracy and refining study selection to emphasize key parameters such as oxygenation levels, respiratory rate, and respiratory support needs.

Conclusions
This study's systematic approach and use of AI-driven screening offer a strong foundation for a validated RSV severity scoring tool. Such a tool holds potential to improve clinical decision-making, enhancing assessment of severity in pediatric patients. Future studies could focus on prospective application and integration into electronic medical records for real-time use in pediatric settings. Standardized severity scoring could ultimately enhance resource allocation, triage accuracy, and patient outcomes, addressing a critical need in RSV management.

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Abstract #75

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Analyzing the Impact of Supplemental Continuous Glucose Monitoring and Foodshare Programs on Glycemic Control Among Women With Diabetes Mellitus.

Background/Purpose

The prevalence of diabetes among women in South Carolina is growing. Uncontrolled maternal diabetes is associated with significant maternal and neonatal morbidity and mortality. The Wellness and EmpOwerment for Women (WOW) program provides primary care and diabetes management to women with or at risk for diabetes. This study examines the association of continuous glucose monitors (CGM) and FoodShare as supplements to medical diabetes management, with change in HbA1c over 12 months.

Methods

Women of childbearing age (18-45 years old) with a diagnosis of diabetes mellitus (T1DM or T2DM) were referred to the WOW program. Participants were included if they had a baseline and 12-month HbA1c measurement. Additionally, clinical assessments and questionnaires also were taken at baseline and 12-month appointments to measure comorbidities, demographics, and socioeconomic factors. Patients also were offered continuous glucose monitors (CGM) and access to a food share program. The collected data was summarized using means, standard deviations, and tabulations. Multivariate regression analysis was performed to examine the association between participation in continuous glucose monitoring and Foodshare programs on changes in HbA1c, controlling for demographics, socioeconomic factors, and comorbid diagnoses of hypertension and depression.

Results

This study found that CGM utilization was statistically significantly associated (0.04) with a reduction in HbA1c (-1.46). Participation in a food share program was not significantly associated with a change in HbA1c.

Conclusions

The study demonstrates the clinical promise of a program focused on CGMs as a supplement to medical management for glycemic control. Future efforts should focus on expanding use of such tools with the establishment of primary care and regular follow-up for women with diabetes in South Carolina.

Student research funded by
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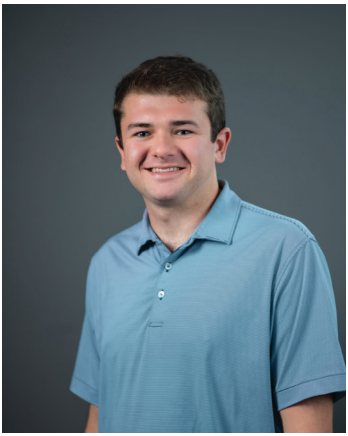

Abstract #97

Connor O'Brien

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Sex Differences in Clinical Risk Factors for Dementia Patients with and without Encephalopathy

Background/Purpose
This study aimed to identify any sex-specific differences in clinical and demographical risk factors for dementia patients with encephalopathy and without encephalopathy.

Methods
Data was retrospectively collected for 128,769 patients treated at Prisma Health-Upstate (previously Greenville Health System) diagnosed with dementia from February 2016 to August 2020. Univariate analysis was done to assess both differences in dementia patients with encephalopathy versus without encephalopathy, as well as sex differences within these two cohorts. Variables from the univariate analysis were used to create a multivariable logistic regression model. This produced adjusted odds ratios (ORs) and 95% confidence intervals (CIs) to predict which clinical variables were more likely to be associated with male versus female sex in the two dementia subpopulations.

Results
In both dementia patients with encephalopathy and without encephalopathy, males were more likely to present with a history of alcohol use, tobacco use, peripheral vascular disease, and memantine use. Females were more likely to present with osteoporosis, anxiety, UTI, URI, insulin use, GI ulceration, headache, CHF, rheumatoid arthritis, SSRI use, and buspirone use. In dementia patients with encephalopathy, females were more likely to have a history of cancer (OR = 0.615, 95% CI, 0.512-0.740), while in the non-encephalopathy group, males were more likely to present with this (OR = 2.573, 95% CI, 2.045-3.238).

Conclusions
The findings of this study demonstrate differences in sex-specific risk factors present in dementia patients of varying etiologies. An understanding of these potential risk factors, and how they may differ among certain types of dementia, can aid in the identification and management of these patient populations.

Student research funded by
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Abstract #45

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Exploratory observational study of shift work exposure and arterial stiffness

Background/Purpose
Cardiovascular disease (CVD) remains the leading cause of death in the U.S., with shift workers, especially night shift workers, facing a higher CVD risk. Emergency Medical Services (EMS) and healthcare personnel often work night shifts, making them a key study population. Non-invasive tools, such as blood pressure (BP) measurement, pulse wave velocity (PWV), and pulse wave analysis (PWA), help quantify CVD risk and assess intervention impacts. Studies suggest that even one night of sleep loss—common among night shift workers—can cause abnormal BP, PWV, and PWA patterns. This study aims to determine the association between prior night shift work exposure and CVD risk among EMS and healthcare workers.

Methods
We used an observational design to study EMS and healthcare personnel in Western Pennsylvania. Up to 100 participants will be recruited, with a prospective cohort sub-study of up to 50 EMS personnel who undergo bi-annual assessments for five years; all other participants will be assessed once. Study components include a comprehensive survey and physiological measurements with standard BP devices and the Sphygmocor device. The survey, conducted through the REDCap tool, covered demographics, shift schedules, exercise, sleep, and fatigue, while physiological measurements included BP, PWA, and PWV. Data were collected in the APL lab and approved community locations. Participants received a $50 gift card and, if applicable, a parking voucher.

Results
The average age of participants in this study is 26.8. An observed PWV of participants (5.8 m/s) was below the European Heart Journal average (6.1 m/s).

Conclusions
Findings could inform targeted interventions, health policies, and occupational health guidelines to reduce night shift workers' CVD risk, particularly for EMS and healthcare workers critical to public health. Further analysis is needed due to limited sample size and ongoing data collection.

Student research funded by
Scholars Fellowship Award

Abstract #89

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Sex and Gender Differences in Alzheimer's Disease: The Preventative Potential of Lifestyle Medicine

Background/Purpose
Lifestyle medicine encompasses an interdisciplinary approach towards disease prevention and management through lifestyle modifications. The six pillars of lifestyle medicine defined in this investigation include exercise, healthy eating, restorative sleep, positive social connections, stress management, and minimizing risky substances. This literature review explores diverse factors contributing to the elevated incidence of Alzheimer's disease in the female sex and discusses the implications of lifestyle medicine for its prevention.

Methods
A sex and gender-specific PubMed search tool was employed to compile sex and gender data about the development of Alzheimer's disease, with a particular focus on its onset in post-menopausal women. The search tool was further implemented to identify lifestyle modifications to help reduce the differential impacts of physiological processes in postmenopausal females leading to the development of Alzheimer's disease.

Results
The Pubmed Search tool generated 34 total articles associating the postmenopausal development of Alzheimer's to dietary factors, with numerous studies citing insulin resistance and increased visceral adiposity secondary to hormonal changes during postmenopause as contributing factors to the development of Alzheimer's Disease. 19 articles investigated the impact of exercise on the development of Alzheimer's Disease, and 6 articles discussed the impact of sedentary lifestyle and inactivity on disease progression. Exercise appears to reduce Tau-phosphorylation, but the relationship may not be significant if an interaction with a positive APOE status exists. As it pertained to risky substances, 24 and 22 hits were gathered for alcohol and smoking, respectively. 54 articles discussed the relationship between positive social connections and Alzheimer's Disease with many implicating limited social support as a risk factor for Alzheimer's disease.

Conclusions
The search tool implicated increased visceral adiposity, insulin resistance, and hypometabolic states secondary to decreased estrogen in postmenopausal females as potential causative agents in the development of Alzheimer's Disease, and further research regarding modifying these factors through lifestyle modifications is warranted.

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Abstract #66

Tina-Nhung Pham

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Prehospital Buprenorphine Programs in the United States: A Scoping Review

Background/Purpose

Prehospital buprenorphine administration programs (PBAPs) have increasingly spread throughout the United States, yet limited information is known on PBAP availability, protocols, and implementation. This scoping review determined where PBAPs operate and identified common protocol features, existing measures of effectiveness, and persisting research gaps.

Methods

Four databases identified PBAPs from academic manuscripts, popular media, and national conferences from database inception to July 15th, 2024. Programs were included if emergency medical services (EMS) clinicians administered buprenorphine. State EMS offices were contacted by phone and email and asked if PBAPs operated within the state. After three failed attempts, physician representatives from remaining states were queried through the National Association of Emergency Medical Services Physicians (NAEMSP). Data extraction included PBAP location, personnel and community partnerships, protocol characteristics, and outcome measures. Results were reported per the Preferred Reporting Items for Systematic Reviews and Meta Analyses extension for Scoping Reviews.

Results

Seventeen states had at least one PBAP, 31 reported none, and two were unknown. Seventeen titles met criteria, identifying 13 unique PBAPs across the Southeast (5), West (4), Northeast (3), and Southwest (1). Prehospital buprenorphine administration (PBA) was administered by community paramedics (53.8%), 9-1-1 paramedics (38.5%), or both (7.7%), mostly post-naloxone reversal (69.2%) or 24-48 hours after overdose response (46.2%). Nine PBAPs detailed protocols; eligibility and dosing varied. Clinical outcomes included treatment engagement, 30-day mortality, and overdose recurrence, with outcome definitions differing. Six programs noted patient and operational barriers, including COVID-19 and EMS clinician bias.

Conclusions

One-third of the United States implement a PBAP, yet limited information and lack of concurrence between protocols and outcomes measurement prevent comparison and generalization of results. Consensus on standardized outcome measures and investigations utilizing robust study designs are necessary to accurately assess effectiveness of PBAPs in the U.S.

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Abstract #69

Maria Gabriela Pita

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Beyond Fitness: Revolutionizing Women's Health Monitoring with INCORA - The Ear-Inserted Wearable Changing Disease Prevention

Background/Purpose

The rise of wearable health monitoring devices has transformed personal healthcare, yet many existing technologies primarily focus on fitness and wellness rather than disease management and prevention. This gap underscores the need for innovative devices tailored specifically for women's health, designed by women who understand the unique healthcare challenges they face. This ongoing clinical trial investigates the efficacy of INCORA earrings, a pioneering wearable health monitoring device, by comparing its performance against the gold standard monitoring device, TytoCare. The primary measures of interest include heart rate, temperature, and oxygen saturation.

Methods

Thirty participants have been enrolled at the University of South Carolina School of Medicine-Greenville. Each participant is required to wear the INCORA earrings for a minimum of six waking and six sleeping hours daily while simultaneously taking measurements of heart rate, temperature, and oxygen saturation using the TytoCare device. Time stamps will facilitate direct comparisons between the readings from the earrings and the TytoCare device.

Results

Preliminary findings will contribute to validating the effectiveness of the INCORA earrings in providing accurate health metrics, aiming to establish a new standard for wearable health technology. The innovative design of these earrings marks a significant advancement as the first wearable health monitor intended for insertion in a body cavity, enhancing comfort and usability for women.

Conclusions

This research highlights the critical need for precise medicine that accommodates the unique health needs of women. By shifting the focus of wearable technology from solely fitness and wellness to comprehensive disease management and prevention, the INCORA earrings represent a groundbreaking step toward more inclusive and effective healthcare solutions. Ongoing analysis will determine their potential to redefine personal health monitoring, particularly for women.

Student research funded by
Scholars Fellowship Award

Abstract #21

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Understanding the relationship between aspects of clinical encounters and overall satisfaction in an LGBTQ+ primary care clinic

Background/Purpose
LGBTQ+ individuals currently face many mental and physical health disparities, due in part to limited access to culturally competent, evidence-based care. Many LGBTQ+ individuals report having experienced stigma in healthcare settings, which can influence a patient's willingness to seek care. As such, it is important to understand factors related to LGBTQ+ patient satisfaction with healthcare, though limited published data on this topic exist currently.

Methods
. In a secondary analysis of patient surveys, we used regression analysis to explore how specific aspects of the clinic experience (staff interactions, aspects of the visit, outcomes) related to overall satisfaction of patients dedicated LGBTQ+ sub-clinic housed in a Family Medicine teaching clinic.

Results
We found that LGBTQ+ patients report higher satisfaction when providers perform physical exams in an inclusive safe manner and we demonstrated that satisfaction is most influenced by the interaction with the residents compared to other staff members and attending physicians. We also showed that having to travel farther to a physician can have a negative effect on overall satisfaction with the patient's visit.

Conclusions
These findings demonstrate the importance of training in how to make exams more comfortable for this population, as well as training in gender inclusivity for all members of the healthcare team, particularly the primary provider. Furthermore, our findings emphasize the need for more gender-affirming providers to improve access, especially in rural areas.

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Abstract #78

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Diversity in Healthcare Website Images: a visual content analysis of Australian massage therapists' and general practitioners' website pages.

Background/Purpose
The visual representation displayed on healthcare websites plays an important role in shaping public perceptions and accessibility of services. Including different demographics in these images is crucial to reducing healthcare disparities, empowering underrepresented populations, and facilitating patient trust. This study aims to analyze the visual content presented on the websites of Australian massage therapists and general practitioners, with a specific focus on the diversity of images related to gender, race, age, ability, and body shape.

Methods
A quantitative visual content analysis was conducted reviewing a total of 150 websites of the included professions (massage therapists = 100 websites; general practitioners = 50 websites). Data collection involved a systematic review of the website images based on predefined image-related categories and categories that explore the diversity of the depicted individuals.

Results
Preliminary analysis indicates a lack of diversity in the visual representation displayed on both massage therapist and general practitioner websites, though people of color were better represented in the GP images than the massage images (11.5% v 6.9%) and men were more highly represented in the GP images (32.6% v 23.3%). In contrast, massage images were more welcoming compared to the GPs (50.3% v 38.6%) and were more likely to represent a provider relationship (69.3% v 38.9%). Tattoos were also more highly represented in the massage images (4.4% massage v 0.2% GPs).

Conclusions
The findings suggest that the current visual landscape may not adequately reflect Australia's multicultural society. This lack of inclusivity could negatively impact patient trust in healthcare services and perpetuate inequitable patient care. Further recommendations include developing guidelines for inclusive visual representation to better reflect the diverse community served by healthcare professionals in Australia.

Student research funded by
Scholars Fellowship Award

Abstract #113

Madeline Reilly

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Does Sternal Talon Plating Increase Healing in Sternal Nonunion After Cardiac Surgery?

Background/Purpose
Sternal closures can occur in numerous ways: conventional wire closure, muscle flaps, and more recently, Talon Plating. Talon plating is a mechanism in which a titanium fixation device (talon plate) is placed over the sternal opening and hooked to paired intercostal spaces on either side of the sternum. Talon plates enhance sternal closure by further approximating the separated sternal halves.This study analyzed incidence of postoperative adverse events (infection, dehiscence, reoperation, rehospitalization) for talon plating, compared to other mechanisms (muscle flaps, sternal rewiring) of sternal closure following open-chest surgeries.

Methods
A retrospective data analysis and electronic medical record (EMR) review of patients who had undergone open chest surgery was performed with consent. Any patient who had undergone median sternotomy using talon plates from 2016-2023 by the Prisma Health Upstate Dept. of Surgery was eligible for inclusion. Patients who developed infected wounds or mediasternitis were excluded from this study. After our initial chart review, there were a total of 13 patients who met the criteria for our initiatives.

Results
Of the 13 patients who met the criteria, only 2 of our patients (15%) who had undergone talon plating needed to be readmitted to the hospital after 30 days. 3 (23%) of our patients needed reoperation within 90 days. 0 (0%) of our patients experience mortality as a result of the talon plates within 90 days.

Conclusions
Talon plating appears to be a more effective method of sternal closure, with reduced postoperative adverse events, as compared to standard methods of sternal closure. Additional research is needed to further elucidate the potential benefits of talon plating in reducing adverse postoperative events.

Student research funded by
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Abstract #86

Luis Rivero

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Identifying Differentially Expressed Genes during Acinetobacter baumannii Infection of Human Cell Lines Using RNA Sequencing

Background/Purpose

This study investigates the genetic mechanisms employed by Acinetobacter baumannii during its replication within human lung cells, aiming to identify therapeutic targets against this highly antibiotic-resistant pathogen. We used RNA sequencing (RNA-Seq) to analyze gene expression in lung cells infected with A. baumannii, focusing on genes and metabolic pathways relevant to the pathogen's replication process.

Methods

RNA-Seq data were processed using RNA extraction, sequence alignment, and data normalization techniques to detect differential gene expression accurately. We performed gene expression and pathway analyses in R, utilizing databases such as KEGG to identify differentially expressed genes and metabolic and regulatory pathways that A. baumannii may exploit during lung cell infection.

Results

We identified several genes with significant upregulation or downregulation in infected cells, indicating their potential role in infection and pathogen replication. Preliminary findings suggest the involvement of key pathways essential to A. baumannii replication, providing possible targets for therapeutic intervention.

Conclusions

This study maps genetic interactions crucial to A. baumannii pathogenicity, highlighting potential actionable targets to inhibit its replication. The insights gained offer a foundation for developing new therapeutic approaches aimed at mitigating the impact of A. baumannii infections on patients.

Student research funded by
Scholars Fellowship Award

Abstract #17

Maegan Rudolph

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Validation of Temperature, Heart Rate, and Blood Oxygen Saturation Measurements from Incora Earrings Wearable Technology for Monitoring of Menstrual Cycle and Fertility

Background/Purpose

Wearable technology has been widely adopted in recent years as it allows individuals to engage in monitoring their health. Incora Health, a company based in the Upstate of South Carolina, aims to elevate the utility of wearable devices for women. Incora earrings take an innovative, inconspicuous form to monitor heart rate, blood oxygen saturation, and temperature, and from these measurements provide information for menstrual tracking and fertility. This study focuses on a Phase I trial that is currently being conducted to evaluate the accuracy of the Incora earrings for vital sign measurements, with menstrual tracking being evaluated in future studies.

Methods

Eligible participants within driving distance of USCSOMG are invited to an in-person enrollment visit during which they complete baseline measurements and receive a pair of the Incora earrings and a TytoCare device for comparison measurements. Over the course of one full menstrual cycle, participants are instructed to wear the Incora earrings and take TytoCare measurements each day from home. The data from these measurements is stored in the Incora iPhone app. After one full menstrual cycle, participants return to USCSOMG for an exit appointment.

Results

Incora earrings are expected to provide highly accurate measurements due to the restricted motion of the earring post, thereby improving the signal-to-noise ratio. At this point in time, participants are continuing to be enrolled in the study and data is still being collected. We anticipate preliminary results by early 2025.

Conclusions

The outcomes of this study will indicate the utility of Incora earrings, a new wearable device taking a unique form. Future studies will more specifically evaluate the ability of the earrings to predict fertility through vital sign measurements. With its innovative device, Incora Health is bridging the gap between wellness and healthcare, providing users with an individualized map of their menstrual health through lifestyle-friendly technology.

Student research funded by
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Abstract #77

Jennifer Rumsey

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Emergency Clinician log in frequency and EHR application loading speed differ across workstation types: a quantitative pilot study of Emergency Clinician: workstation interactions across technological transition

Background/Purpose

Background: Rapidly changing healthcare technology necessitates transitions that support clinician workflow, staff satisfaction, and patient care. Until a recent upgrade, the GMH emergency Dept. (ED) used legacy manual log in (T0) and badge-swipe log in (T2) workstations. Upgrades to faster modern technology require emergency physicians (EPs) to adapt to new configurations. In this context, we evaluated and compared how EPs interact with each workstation to define key EP:workstation interactions and inform future workstation design.

Methods

Methods: We quantified EP: workstation interactions in a convenience sample of 20 Prisma-employed adult and pediatric EPs at GMH. The ATracker Pro mobile app tracked workflow, application use, loading speed, and task duration during 2 hours of EP shifts. Observed events were quantified by frequency and duration and compared across T0 and T2 workstations using t-tests. The study was IRB exempt as QI; consent was obtained from all participants.

Results

Results: Most measured workflow tasks, login times, and clinical application interactions did not vary significantly between workstation types. EPs logged in more frequently on T2 workstations due to short (<5 min) automatic log outs. Notably, the EPIC Electronic Health Record (EHR) software loaded significantly faster (p=0.009) on the new (T2) computers.

Conclusions

Conclusions: This pilot study reveals a variable impact of technological changes on EP workflows. While the transition to new T2 computers did not significantly alter most tasks or application use times, the EPIC EHR loaded more quickly. This may improve EP workflow efficiency. However, the T2 workstations introduced new challenges as login frequency increased due to auto-logouts. Future work will include surveys and interviews to explore the perceived impact of this change. Overall, findings suggest technological advancements can both enhance aspects of performance and introduce inefficiencies. Future workstation design will need careful consideration of security and efficiency priorities to optimize EP:workstation interactions.

Student research funded by
The Prisma Health Dept. of Emergency Medicine

Abstract #61

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Lifestyle Medicine in Practice: Lifestyle Medicine Provider Methods and Impact on Patient Outcomes within Prisma Health

Background/Purpose
Lifestyle Medicine (LM) interventions provide physicians with a critical toolkit to combat the increasing morbidity and mortality from chronic diseases in the United States. To maximize the effectiveness of the evidence-based practice of LM, more studies are needed to demonstrate what LM looks like in practice and the impact on patient outcomes. The goal of this study is to describe the methodology that Prisma Health board-certified LM providers utilize and measure the effectiveness of LM interventions for chronic disease on patient outcomes.

Methods
Eight board-certified LM physicians in primary care at Prisma Health were invited to complete a semi-structured interview regarding methods, facilitators, and barriers to employing LM practices. The hour-long interview was recorded, and the transcript was analyzed using the Dedoose Qualitative Coding Apps. The presence of social and economic factors, such as food insecurity and lack of transportation, as indicated by patients were assessed to understand patient barriers to implementing lifestyle change. To assess health outcomes, quantitative data (BMI, HbA1c, lipid levels, and exercise vital signs) are being collected from Prisma's electronic health record system and will be analyzed using a paired samples t-test with an alpha=0.05.

Results
All eight LM providers completed interviews. Themes that emerged demonstrated that LM providers utilized motivational interviewing, FITT principles for physical activity and SMART goals when establishing lifestyle changes with patients. LM providers also relied on community-based resources such as FoodShare, Exercise is Medicine Greenville® and Walk with a Doc. Patient data is currently being analyzed to demonstrate the impact of LM intervention on biological markers of chronic disease.

Conclusions
LM practices provide physicians with unique evidence-based interventions to reduce chronic disease and improve patient outcomes. The information gathered will be used to provide insight for both physicians and healthcare systems working with patients with chronic conditions to illuminate how LM interventions can be successful for these populations.

Student research funded by
Scholars Fellowship Award

Abstract #48

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Sex and Gender Specific Impacts of Whole Food, Plant-Based Nutrition on Colorectal Cancer: A Review on Dietary Fiber and Risk Reduction

Background/Purpose
This study aims to systematically investigate the existing literature on colorectal cancer in relation to the whole foods, plant-based nutrition pillar of lifestyle medicine, with a focus on sex- and gender-based differences. By conducting a thorough PubMed search, the goal was to identify patterns and gaps in current research, particularly how lifestyle interventions may differ in their impact on colorectal cancer prevention and treatment between men and women. The findings will provide a foundation for more targeted interventions in lifestyle medicine, considering both biological sex and gender influences.

Methods
A search of PubMed was conducted from June to July 2024 to identify research on colorectal cancer, focusing on whole food, plant-based nutrition and sex and gender. The search was conducted using an advanced toolkit developed by the Sex & Gender Specific Task Force and Program team at Texas Tech University (1). MeSH terms associated with whole food, plant-based nutrition were chosen through iterative discussion among the study team members.

Results
Our search yielded 117 studies under the whole foods, plant-based nutrition pillar, of which 7 of those were found under the additional MeSH term “dietary fiber,” exploring the relationship between dietary fiber intake, colorectal cancer risk, and sex- and gender-specific dietary patterns. The results found an inverse relationship between dietary fiber intake and colorectal cancer risk in both sexes. However, the strength of these relationships related to sex and gender differs based on factors such as fiber source and life stage. For example, lower levels of estrogen found in postmenopausal females may serve as an explanation for the differing strengths of risk reduction associated with colorectal cancer.

Conclusions
The findings suggest that increasing dietary fiber intake and customizing dietary patterns based on sex, gender, and life stage—such as menopausal status—may play a protective role in reducing colorectal cancer risk.

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Abstract #12

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Ectrodactyly: System Wide Treatment Strategies and Outcomes in a Pediatric Orthopaedic Hospital Healthcare System

Background/Purpose

Ectrodactyly is a rare deformity with central deficiency of the foot resulting in clefting of the limb. Treatment can be nonoperative in those patients with adequate foot function, the ability to wear shoes, and no pain. Operative treatment is considered when pain develops over the plantar aspect of the foot or the cosmesis is unacceptable to the patient. Literature to guide treatment on Ectrodactyly is limited, consisting of mostly case reports of surgical outcomes. This study's primary objective was to review a pediatric population with ectrodactyly and report observed treatment strategies and outcomes.

Methods

A retrospective review among 21 Shriners Children's hospital locations identified patients under the age of 18 with a diagnosis of Ectrodactyly involving feet. Patients were reviewed and included when inclusion criteria were met. Patient demographics, clinical history and surgical data were collected.

Results

A total of 200 patients (54% female), ranging from 10 months to 18 years of age, were included. The study sample's racial composition was heterogeneous. Using preoperative radiographic images, participant cleft feet were classified by the criteria described in the Blauth system. All types were observed with II (69), III (51), IV (73), and V (64) being predominant. Approximately half of the sample (53%) underwent surgery with most consisting of cleft closure (29%) or combination of cleft closure and realignment osteotomy (42%). Three patient surgeries (3%) resulted in complications including calcaneal displacement, protruding hardware of the medial foot requiring removal and debridement, and wound dehiscence following right knee disarticulation.

Conclusions

Ectrodactyly is a rare condition with variable presentation. More severely involved feet with deep central clefting and splaying of the forefoot may require surgical intervention. Surgical strategies include correction of the cleft and narrowing of the forefoot to facilitate weight bearing and shoe wear. In this review, approximately half of patients required surgical intervention.

Abstract #38

Emma Sherman

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The implementation and utilization of a new supplementary resource between first- and second-year medical students.

Background/Purpose
Most medical students supplement the formal medical school curriculum with third-party resources. To improve integration of third-party resources within the curriculum, the USC School of Medicine Greenville incorporated ScholarRx, which the company defines as a digital learning platform for medical schools. The overarching goal of this project was to identify how medical students utilized ScholarRx. Specifically, we investigated which modalities were most frequently used, differences between ScholarRx usage amongst first- and second-year students, and usage throughout different modules.

Methods
De-identified data was sourced from ScholarRx and retrospectively analyzed to evaluate student usage patterns and trends. Dependent variables included number of students users, distinct number of resources used, and the time that students spent on ScholarRx resources including express videos, flash cards, bricks, and Qmax (a question bank for students). The population studied was the first- and second-year students of the USC School of Medicine Greenville during the 2023-2024 academic year. The two cohorts had different organization of curriculum due to a curricular refresh. The data was organized, analyzed, and graphed using Microsoft Excel.

Results
Key findings of this preliminary research reveal that the first- and second-year students spent more time on Qmax and Bricks than express videos and flash facts. Furthermore, when examining time spent across modalities, second-years spent most time on Qmax, with increased use before Step 1. First-years spent most time on Bricks, and the modules with the highest average brick usage were Foundations 1, Foundations 2, and Musculoskeletal/Dermatology/Rheumatology.

Conclusions
The data suggests that first-years used the bricks, especially in courses in which they were assigned. Second-year students' ScholarRx use of the question bank coincided with dedicated study for USLME Step 1. Future implications of this research will focus on identifying factors that influence student engagement with ScholarRx and exploring the relationship between ScholarRx usage and academic performance.

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Scholars Fellowship Award

Abstract #29

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A case of suspected Drug Induced Subcutaneous Lupus following IVIG therapy

Background/Purpose
Drug induced subacute cutaneous lupus (DI-SCLE) is a form of subacute cutaneous lupus (SCLE) typically associated with medications such as antihypertensives, proton pump inhibitors, and anticonvulsants. Recently, more therapeutics have been associated with the development of DI-SCLE, including IVIG. We report a case of suspected DI-SCLE in a patient treated with IVIG for chronic inflammatory demyelinating polyneuropathy (CIDP).

Methods
A 59-year-old male with past medical history of hypothyroidism, autoimmune gastritis, COPD, and CIDP presented to the dermatology clinic with non-pruritic erythematous papulosquamous rash in photodistributed areas following monthly IVIG infusion. The patient reported a waxing and waning pattern of rash development, with symptom onset 10-15 days following infusion and resolution prior to subsequent treatment. Following initial relief with topical steroids, the patient reported worsening rash with more severe presentation following infusions. A punch biopsy showcased interface dermatitis along with perivascular and periadnexal lymphocytic inflammation, consistent with drug eruption or autoimmune process. The patient elected to discontinue IVIG therapy on numerous occasions with resolution of symptoms, however quickly restarting treatment due to severe debility in the setting of CIDP. Various differently branded IVIG products were tried, each leading to rash development. At this time, the patient reported new onset pruritus associated with rash which was controlled with antihistamines. Topical steroid escalation resulted in lesion improvement. Previously involved areas resolved with post inflammatory hypopigmentation.

Results
Awaiting laboratory testing for ANA and SSA antibodies.

Conclusions
Diagnosing DI-SCLE continues to present a clinical challenge due to a lack of formal diagnostic criteria and varying clinical presentation. This case adds to existing limited reports suggesting a possible new association between IVIG and DI-SCLE. As the use of IVIG therapy for a variety of conditions continues to expand, clinicians should have a high index of suspicion for DI-SLCE in patients presenting with new onset rash following therapy.

Abstract #9

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Deleterious Impact of Plasminogen Activator Inhibitor-1 (PAI-1) on Podocyte Morphology and Function

Background/Purpose
PAI-1 is a serine protease inhibitor that promotes thrombosis and fibrosis by inhibiting urokinase-type and tissue-type plasminogen activator (uPA and tPA) activity. Increased PAI-1 levels and local expression are associated with poor long-term outcomes of kidney and cardiovascular diseases, linked in part to decreased degradation of extracellular matrix leading to glomerulosclerosis and tubulointerstitial fibrosis. This study investigates whether PAI-1 also directly affects podocyte morphology and function, contributing to glomerular injury.

Methods
Primary podocytes were isolated and cultured from wildtype (WT) and PAI-1 knock-out (KO) mice, treated with either vehicle or puromycin aminonucleoside (PAN), which injures podocytes. We also studied three glomerular injury models in mice with intact PAI-1 versus PAI-1 KO transgenic mice, and quantified podocyte density and glomerular collagen IV deposition.

Results
In cultured podocytes, the knockout of PAI-1 significantly increased RhoA activity with decreased Rac1 and Cdc42 activity. In both primary (Nep25) and secondary (5/6Nx) podocyte injury models, systemic PAI-1 knockout protected podocytes against injury with reduced glomerular matrix compared to WT. PAI-1 podocyte conditional knockdown (KD) preserved podocyte loss and reduced glomerulosclerosis in the Nep25 model compared to WT, while the WT1+ cell density and glomerular collagen IV deposition were comparable between the two groups in a mild hypertensive model with angiotensin infusion and uninephrectomy (AngII+Unx).

Conclusions
Through Rho GTPases, PAI-1 directly impacts podocytes by modulating the cytoskeleton, revealing a novel mechanism of action. Podocyte-specific PAI-1 KD provides less glomerular protection compared to systemic PAI-1 KO, indicating the involvement and cross-talk of cells in secreting and responding to PAI-1.

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Abstract #80

Alexandra Smith

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Macro and Micro Level Artifical Intelligence Analysis of Prostate Cancer TNM Staging from Electronic Health Records

Background/Purpose
The National Cancer Institute Community Oncology Research Program (NCORP) provides hospitals access to advanced therapies and national research databases. A key criterion for NCORP designation is thorough documentation of patients' cancer metrics, including their Tumor, Node, and Metastasis (TNM) stage. The TNM staging system classifies cancer severity and spread based on three factors: the size and extent of the primary tumor, involvement of nearby lymph nodes, and the presence of distant metastasis. However, the extensive documentation required for TNM staging is resource-intensive, prompting our investigations into the use of Natural Language Processing Artificial Intelligence (AI) to streamline this process.

Methods
Our studies evaluated macro and micro-AI analyses for TNM staging in prostate cancer. For the macroanalysis, AI was given each patient's complete electronic health record (EHR) to extract a single TNM stage. Human verification of 100 patients, showed that the macroanalysis model (n=98 after exclusions) achieved a 96.1% positive predictive value, 100% negative predictive value, 95% specificity, and 100% sensitivity. The microanalysis, on the other hand, examined each urology clinic visit individually; here, the AI reviewed provider notes for each visit, extracting a new TNM stage at each time point. This model (n=976) demonstrated a 92.9% positive predictive value, 99.7% negative predictive value, 98.2% specificity, and 98.9% sensitivity. These results were analyzed using a Z-test for two independent proportions ($p<0.05$).

Results
Both approaches demonstrated feasibility; however, the microanalysis approach showed a statistically significant improvement in specificity ($p=0.035$) without a significant reduction in sensitivity ($p=0.298$), positive predictive value ($p=0.230$), or negative predictive value ($p=0.589$).

Conclusions
An additional advantage of the microanalysis model is its ability to track staging changes over time, making it particularly valuable for applications requiring continuous monitoring of cancer progression. Our ongoing research will expand to include 300 patients to explore these applications further, focusing on enhancing efficiency in NCORP documentation.

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Abstract #58

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The Impact of Sarcopenia on Pancreaticobiliary Cancer Prognosis

Background/Purpose
Sarcopenia, defined as low skeletal muscle mass with loss of function, can be seen with increasing age, disease, or lifestyle factors and has been associated with increased adverse health outcomes. Prior studies have found mixed results on whether sarcopenia has an impact on survival outcomes in patients with cancer. The primary aim of this study is to investigate the impact of preoperative sarcopenia on gastrointestinal cancer prognosis at a single institution.

Methods
In total, 64 patients who had CT imaging prior to surgical interventions for pancreaticobiliary primary tumors between 2016 and 2019 at a single institution were retrospectively evaluated. The presence of sarcopenia was assessed using the skeletal muscle index (SMI). The SMI is calculated by measuring the total cross sectional skeletal muscle area at the L3 vertebral level, which is then normalized for height. Progression-free survival, overall survival, and other variables were analyzed with respect to the sarcopenic and non-sarcopenic groups.

Results
The mean progression-free survival for the sarcopenic group was 29.19 months, which was not significantly different than the mean progression-free survival for the non-sarcopenic group at 47.42 months (p=0.1490). Overall survival significantly differed between the two groups, with the sarcopenic group having a mean overall survival of 30.46 months, while the mean overall survival for the non-sarcopenic group was 53.03 months (p=0.0034).

Conclusions
Preoperative sarcopenia may be a valuable condition to address in patients with gastrointestinal cancer to improve tolerance to chemotherapy and overall survival outcomes.

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Abstract #26

Jack Stomberger

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Balancing Depth and Simplicity: Faculty Experiences with the ScholarRx Digital Learning Platform

Background/Purpose
ScholarRx is a multidisciplinary digital learning platform providing resources to medical students to help with Step One and didactics studying. This external resource was implemented within USC School of Medicine Greenville during a curricular refresh to be a supplementary resource for medical students as well as to offer faculty a central resource for asynchronous learning, whether it be lectures (bricks), tutoring sessions, or practice problems (QMAX). The goal of this study was to gain insight on faculty perception of the resource, its uses, and its advantages and disadvantages with quality, content, and applicability.

Methods
Biomedical Science faculty who had used ScholarRx were invited to participate in this qualitative study. Participants (n = 5) were interviewed using a series of semi-standardized questions. We conducted an applied thematic analysis on the deidentified transcripts and coded them iteratively.

Results
Participants discussed their understanding of ScholarRx, how they used it in their teaching, and identified the pros and cons based on their experiences with the resource. Most found the resource to be efficient and versatile with its multiple modalities (bricks, practice questions, flashcards, etc) and utilized it for asynchronous learning study materials as well as practice quizzes. They also saw its usefulness for Step One study. However, a few thought ScholarRx to be at an introductory level lacking the adequate depth or breadth to stand alone for in-house lecture material, leading to more time spent editing or searching for sufficient resources.

Conclusions
ScholarRx has potential for greater incorporation into the curriculum, and many faculty have expressed interest in expanding their use in teaching as well as exploring other aspects of the program. Future research should evaluate the strengths and opportunities of effective implementation to support successful medical student matriculation into clerkship learning.

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Abstract #56

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The Impact of Community-based Adaptive Sports on Depression and Quality of Life in Persons with Disabilities

Background/Purpose

Disabling injuries impair daily activities which often lead to a decreased quality of life (QOL) and depression. Community-based adaptive sports programs have demonstrated success in engaging individuals to become more active. Several programs exist to provide variability in physical activity. Most studies also look at either QOL or depression, while few studies simultaneously examine the effectiveness of both parameters. The purpose of this study is to examine the effects of community-based adaptive sports programs in persons with disabilities on QOL and depression as compared to individuals prior to participation.

Methods

A within subjects design was used for this prospective study. A cohort of participants with disabilities participated in the adaptive sports program. Participants could either be novel to the sport or have participated in the sport that underwent a washout period of 8 months. Preparticipation, participants completed a modified SF-36 to assess changes in QOL and the Center for Epidemiologic Studies Depression scale (CES-D) to assess changes in depression. The questionnaires were distributed using REDCap software. Following completion, post surveys were sent. Outcome data was analyzed using t-tests with α=0.05 set as significant.

Results (anticipated)

A total of 14 participants completed surveys before participating in the program; 12 completed post surveys. The total number of completed events is as follows: Yoga: 20, Cycling: 3, Pickleball: 2. Non-significant ($p>0.05$) but potentially clinically meaningful trends have been observed in these pre/post 12 participants for improvements in physical functioning, energy, and emotional well-being. Interestingly there was a trend for an increase in levels of depression (20%) and pain (13.6%) after completion of the adaptive programs.

Conclusions

These preliminary findings may elucidate the innovative use of adaptive sports within communities for improving QOL and depression. Future research could look at improved physical fitness of adaptive sports programs on individuals with disabilities.

Student research funded by
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Abstract #63

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Racial/Ethnic and Sex Disparities in Pediatric Primary Hypertension: A Systematic Review

Background/Purpose
Racial/ethnic and sex disparities in the prevalence of adult hypertension are well documented. Despite the escalation of hypertension rates among children and adolescents in the United States limited attention has been given to examining demographic differences in pediatric hypertension. The goal of this study is to systematically assess the current prevalence of hypertension in the pediatric population by sex, race/ethnicity, and body mass index (BMI) in the United States.

Methods
PubMed, Cochrane, Embase, and Web of Science databases were searched for eligible studies from January 1996 to April 2024. Inclusion criteria consisted of studies conducted in the United States that contained demographic data (sex and race/ethnicity) and defined pediatric hypertension as elevated blood pressure after three consecutive non-sick visits with a clinician. Meta-analyses were conducted in Stata v18 to determine overall prevalence of pediatric hypertension and prevalence by race/ethnicity, sex, and BMI.

Results
The literature search identified 21,212 publications, from which 9 studies meeting the inclusion criteria were selected. The overall prevalence of pediatric hypertension was 4%. Among females, prevalence was 3% , while males were 4%. Across all racial/ethnic groups except African Americans, females exhibited lower prevalence rates compared to males. Non-Hispanic blacks and Hispanics had a similar overall prevalence at 4%. Non-Hispanic whites was 3%. All studies demonstrated a positive association between increasing BMI and the prevalence of pediatric hypertension. However, among those with obesity, African Americans had the lowest prevalence of pediatric hypertension compared to all other racial/ethnic groups.

Conclusions
Although the latest guidelines on pediatric hypertension issued by the American Academy of Pediatrics in 2017 have made significant progress in simplifying the identification and diagnosis of pediatric hypertension, they do not incorporate consideration of race/ethnicity in screening recommendations. While ample evidence supports the link between weight and hypertension, this study highlights the racial/ethnic differences between that association and underscores distinct sex disparities in pediatric hypertension.

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Abstract #28

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Medication Adherence to sodium-glucose cotransporter-2 (SGLT2) inhibitors versus glucagon-like peptide-1 (GLP-1) receptor agonists: a meta-analysis

Background/Purpose
Glycemic control with antihyperglycemics in individuals with diabetes has long been associated with reductions in the incidence of chronic kidney disease (CKD). Recent evidence has also demonstrated that sodium-glucose cotransporter-2 inhibitors (SGLT2Is) slow the progression of CKD. However, optimal medication adherence with antihyperglycemics is needed to achieve outcomes. We sought to perform a meta-analysis to compare medication adherence to SGLT2Is versus glucagon-like peptide-1 receptor agonists (GLP-1RAs).

Methods
A systematic search of Medline and Embase was conducted through October 2023. To meet inclusion criteria, articles had to be published in full text form and directly compare medication adherence to SGLT2Is versus GLP-1RAs. Only studies evaluating real-world data and utilizing proportion of days covered (PDC) to measure adherence were included. Non-adherence, defined as the proportion of patients with a PDC<80%, was the primary outcome for this study. A subgroup analysis evaluating results among studies conducted in the US was performed.

Results
We identified 8 studies evaluating 205,103 patients for inclusion. Most studies derived data from the US (n= 5 studies). The proportion of patients with non-adherence (i.e., a PDC<80%) ranged from 27%-62% among those taking SGLT2Is and 26%-80% among those taking GLP1-RAs across included studies. Upon meta-analysis, SGLT2I use was associated with lower risk of non-adherence compared to GLP-1RA use, but no statistical difference was observed (relative risk [RR] = 0.86; 95% confidence interval [CI] 0.72-1.02). In the analysis including only US studies, SGLT2I use was associated with 23% lower risk of non-adherence compared to GLP-1RA use (RR = 0.77; 95% CI 0.72-0.82).

Conclusions
In this meta-analysis, SGLT2I use was associated with higher medication adherence vs. GLP-1RA use; however, this difference was not statistically significant in the overall analysis. SGLT2I use was associated with higher adherence when analysis was limited to US studies. Adherence may differ across antihyperglycemic regimens and thus impact their achieved outcomes.

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Abstract #111

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Optimizing Dialysis Care: A Retrospective Analysis of Omentopexy's Impact on Catheter Function

Background/Purpose
End-stage renal disease (ESRD) is a significant global health concern. Peritoneal dialysis (PD) is a common form of renal replacement therapy. Its success depends on the proper functioning of the peritoneal dialysis catheter which can be affected by various complications, including catheter malfunction. The optimal surgical approach to minimize catheter complications remains debated. Omentopexy, a procedure where the omentum is secured to the anterior abdominal wall, may improve catheter function; however, evidence on its efficacy is limited.

Methods
This retrospective cohort study analyzes the outcomes of 400 patients following initial peritoneal catheter placement at Greenville Memorial Hospital from January 1, 2018, to May 15, 2024 to explore this technique's potential benefits. Data collection is ongoing, and the study primarily aims to compare the rate of catheter malfunction between patients who received omentopexy and those who did not. Secondary objectives include evaluating readmission rates, reasons for catheter removal, and characterizing the peritoneal dialysis patient population at Greenville Memorial.

Results
We anticipate that omentopexy may be associated with lower rates of reoperation for peritoneal dialysis catheter malfunction. Statistical methods, including logistic regression analysis, T test, and ANOVA, will be utilized for data analysis.

Conclusions
By collecting data on patient comorbidities and prior abdominal operations, we seek to better understand the impact of these patient factors on the function of peritoneal dialysis catheters. By comparing our primary (reoperation for catheter malfunction) and secondary outcomes (readmission within 30 days and catheter removal) between patients who underwent omentopexy and those who did not, we hope to provide more definitive evidence on the association of omentopexy with favorable patient outcomes. The anticipated results will add evidence on the viability of omentopexy as a standard practice, help identify patient populations that may benefit most, and support tailored treatment for those with specific comorbidities.

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Abstract #102

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Evaluating Outcomes and Complications of Inspire® Hypoglossal Nerve Stimulation for Obstructive Sleep Apnea: A Retrospective Analysis

Background/Purpose
Obstructive sleep apnea (OSA) is defined by the presence of an apnea-hypopnea index (AHI) ≥ 5/h accompanied by excessive daytime sleepiness, unrefreshing sleep, extreme tiredness, and/or impaired quality of life (QoL) related to sleeping. OSA increases the risk of incidence of cardiovascular disease, and traffic accidents, as well as reduced QoL. In recent years, hypoglossal nerve stimulation (HNS) has been shown to be a minimally invasive technique that acts through synchronized stimulation of the upper airways, improving the severity of OSA in patients. Inspire® is a type of HNS that is synchronized with breathing. It produces a contraction of the genioglossus and geniohyoid muscles of the tongue with repercussions on the palate through the palatoglossus muscle, facilitating the patency of the upper respiratory tract. Inspire® is indicated in patients >18 years old, with a BMI <35, moderate/severe OSA, AHI >15, and inadequate adherence/tolerance or rejection of CPAP. Given the lack of published annual rates of stimulator implantation surgery, we are currently unable to define the frequency or risk of complications in patients with upper airway stimulation implants. There is also restricted patient demographic and follow-up data and no information on surgeon experience and case volume; thus, it is difficult to ascertain whether complications are device, procedure, or patient dependent Additionally, this study found increased cases of revision surgery and device explantation. Further investigation is necessary to identify risk factors and areas for operative improvement.

Methods
Utilizing a retrospective chart review, 204 patients that received implantation of the device at PRISMA Health upstate sites were analyzed. Inclusion criteria is patients who have undergone Inspire implantation device at PRISMA Health Upstate and that the patients are over the age of 18. Exclusion criteria is patients under the age of 18. The date of surgery, surgeon, operative time, anesthesia time, patient co-morbidities, age, complications, and AHI prior to and after surgery were recorded. This data will be used to examine the cost of surgery as well as the benefits, rates of complications, and common risks of the procedure. Additionally the change in operative time as the surgeon performed more operations will be examined. Data will be collected from Epic based on CPT/ICD 10 codes, and managed using REDCap, a HIPAA compliant online database.

Results
Results are currently a work in progress however are expected to be available before presenting. Expected results include decreased operative times as the surgeons gained experience with the procedure. Decreased AHI following activation of the implant and low rates of complications are also expected.

Conclusions
In conclusion, hypoglossal nerve stimulation (HNS) using the Inspire® device appears to be a promising alternative for patients with moderate to severe obstructive sleep apnea who are intolerant or unresponsive to CPAP therapy. The significance of this study lies in its potential to advance the understanding of hypoglossal nerve stimulation (HNS) as a viable treatment for obstructive sleep apnea (OSA) in patients unable to tolerate or benefit from CPAP. By documenting both the benefits and complications associated with the Inspire® device, this research aims to contribute critical insights into patient outcomes, surgical learning curves, and operative improvements. Finally, this study underscores the need for long-term data on HNS and paves the way for future research on optimizing HNS protocols, reducing healthcare costs, and enhancing the quality of life for OSA patients.

Abstract #64

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Pain Interference and Impaired Sleep in Breast Cancer Survivors Taking Estrogen Deprivation Therapy

Background/Purpose

Breast cancer survivors (BCS) are frequently prescribed estrogen deprivation therapy (EDT) to decrease the risk of cancer recurrence. Unfortunately, insomnia is a common adverse effect of EDT. Poor sleep quality is associated with daily fatigue and has been shown to exacerbate pain interference. These side effects can impair the quality of life in BCS, and patients are more likely to discontinue these medication regimens. Previous studies have explored the short-term impact of EDT on sleep; however, objective and longitudinal sleep data in BCS is limited. This study examined the effects of disturbed sleep on reported pain interference (PI) in BCS taking EDT over long periods of time.

Methods

Thirty-three BCS receiving EDT wore a ReadiWatch™ actigraphy device for two months. These devices measured multiple metrics to examine sleep, resulting in a cumulative ReadiScore™ that represents sleep quality. Additionally, participants answered pre- and post-study questionnaires, including the Pittsburgh Sleep Quality Index (PSQI) and the Patient-Reported Outcomes Measurement Information System (PROMIS) questionnaire for PI.

Results

A paired samples t-test comparing PSQI data prior to and following the study showed significant decrease in PSQI across the 2-month study period ($p < 0.05$). Spearman correlation examining the relationship between ReadiScore and PI, revealed a significant negative correlation, rho (32) = -0.44, $p < 0.05$. PI and PSQI were significantly, positively correlated, rho (32) = .353, $p < .05$.

Conclusions

Data suggest that participants' perceived sleep quality improved by wearing a ReadiWatch™ and having access to objective sleep data. Additionally, participants with poor sleep effectiveness experienced increased pain interference in their daily activities. Finally, pain interference in participants was directly correlated to their perceived sleep quality. This study can provide insight into the effects of disturbed sleep on pain interference in BCS, which may ultimately benefit quality of life and medication adherence in BCS.

Abstract #22

Emily Thomas

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Comparative Analysis of Laparoscipic and Robotic Appendectomy: A Multi-Hopsital Retrospective Cohort Study

Background/Purpose
Appendectomies are one of the most commonly performed procedures by general surgeons in the United States and the laparoscopic approach has been the standard for decades. However, adoption of robotic assistance for the treatment of diseases of the appendix continues to grow. Despite this growth, clinical outcomes regarding laparoscopic versus robotic appendectomy remain unclear.

Methods
We conducted a multi-hospital retrospective cohort study of patients who underwent appendectomy between August 1, 2021 and February 29, 2024. We compared preoperative clinical characteristics, intra-operative surgical details, and post-operative outcomes between laparoscopic and robotic groups. The post-operative outcomes analyzed included conversion to open, need for extended resection, 30-day return to the operating room, need for blood transfusion, 30-day readmission, abscess requiring drain, and death. Statistical analysis included chi-square tests, student t-tests, and multivariable logistic regression.

Results
A total of 1,431 patients (1,079 laparoscopic, 352 robotic) were included for analysis. The robotic group was found to have a higher proportion of Caucasian patients, more American Society of Anesthesiologist (ASA) class 2 patients, and a higher proportion of non-elective cases. We also found that more robotic appendectomies were completed at community hospital sites rather than larger academic medical centers. Robotic surgery was associated with significantly lower rates of conversion to open ($p < 0.001$). Additionally, robotics was associated with significantly lower rates of unexpected extended resections ($p=0.015$). We also saw trends towards statistical significance for reduced need for blood transfusion and abscess requiring IR drain in the robotic group. To account for preoperative differences between the two groups, a multivariable logistic regression analysis was performed, and the robotic group was associated with a 66% decreased risk of any complication (OR = 0.34, 95% CI [0.17, 0.68]).

Conclusions
Robotic appendectomy demonstrates favorable clinical outcomes compared to the traditional laparoscopic approach. These findings support the advantages of a robotic-assisted approach to appendectomy.

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Scholars Fellowship Award and the Prisma Health Dept. of Surgery

Abstract #72

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Treatment of Atorvastatin leads to multidrug resistance in colorectal cancer cells

Background/Purpose
Multidrug resistance (MDR) is a feared complication that can arise during treatment of cancer. Patients face a significantly higher risk of morbidity and mortality when the efficacy of their chemotherapeutic regimens is compromised by resistance. One documented mechanism is the increased activity of the P-glycoprotein (Pgp) transporter where the protein pumps chemotherapeutic agents from tumor cells. A common cause of increased activity of Pgp is the overexpression of ABCB1 gene, which encodes for the Pgp. In most cancer cases, MDR occurs after exposure to chemotherapeutic agents; however, MDR has been identified in chemotherapy-naïve cells with no clear explanation. Our study looks at statins and the possible link of MDR in chemo-naive cancer cells.

Methods
We hypothesize that exposure to Atorvastatin can lead to overexpression of ABCB1 and confer resistance to future chemotherapy treatment. Our goal is to analyze cell lines from colorectal cancer patients (Caco2 and Sw480 cell lines) that have been treated with Atorvastatin in order to identify common overexpressed genes that may contribute to multidrug resistance. The cancer cells were analyzed for expression using RNA-Seq and measurement of the transcriptome was performed using Genome Workbench.

Results
"We anticipate that the results of our study will allow us to identify genomic alterations in the pharmacokinetic pathway, through genes such as ABCB1, which play roles in cancer progression and the development of MDR.

Conclusions
Statins are the drug of choice in the treatment of hyperlipidemia and the prevention of cardiovascular disease. In the United States, statins are among the most prescribed medications. With the incidence of colorectal cancer increasing, identifying statin-induced multidrug resistance to current chemotherapeutic agents is imperative. This would allow for the development of novel drug therapies and the improvement of personalized medicine to tailor specific chemotherapeutic agents to a patient's genomic profile.

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Abstract #92

Yash Verma

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Transcriptional Responses to Necrotizing Fasciitis-causing Acinetobacter baumannii Infection in Human Macrophages

Background/Purpose

Necrotizing fasciitis (NF) is a severe bacterial infection known for its rapid progression and high mortality rate. Acinetobacter baumannii is a pathogen of critical concern that's prevalent in NF and notable for its multidrug resistance. Previous research shows that various strains of NF-causing A. baumannii (NFAb) display increased survival within macrophages after phagocytosis compared to non-fasciitis causing strains, suggesting unique immune responses or evasion mechanisms. This study aims to identify the unique transcriptional responses of macrophages infected with NFAb strains by focusing on gene expression profiles that underlie its pathogenicity and immune evasion techniques.

Methods

Human macrophages were infected with different strains of A. baumannii: necrotizing fasciitis isolates (NFAb1 and NFAb2) and two reference strains (19606 which is low pathogenicity and 17978 which is high pathogenicity). RNA-sequening (RNA-seq) was carried out to see how genes are differentially expressed in response to the various strains. R studio was utilized to analyze the data through expression normalization, principal component analysis, and differential expression analysis. The results were then visualized and interpreted using gene ontology analyses, volcano plots, and heatmaps.

Results

We expect to see significant differences in how macrophages respond to NFAb strains compared to reference strains. It's likely that key immune-related genes and pathways, especially those associated with cytokine signaling, macrophage activation, and inflammation will be differentially regulated during infection with NFAb strains compared to reference strains.

Conclusions

This study sheds light on how NFAb strains may evade the immune system and survive inside macrophages after phagocytosis through alteration of the antimicrobial immune response. Our results could lead to new treatments targeting bacterial survival pathways by identifying key gene expression patterns that aid with immune evasion and intracellular survivals. Understanding these mechanisms will hopefully lead to improved treatment options for necrotizing fasciitis caused by multidrug-resistant A. baumannii and may inform therapeutic strategies for all types of A. buamannii infection

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Abstract #41

Charlotte Vogel

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Effects of the subjective mystical experience on major depressive disorder in patients receiving intravenous ketamine

Background/Purpose
Some patients with major depressive disorder (MDD) are resistant to traditional treatments such as antidepressants and psychotherapy. Studies have shown that psychedelic substances such as psilocybin, LSD, MDMA, and ketamine can induce a subjective mystical experience that is associated with improvement of MDD symptoms. Although the mechanisms of typical psychedelics (psilocybin, LSD, MDMA) and ketamine are broadly understood, knowledge on their exact psychological effect is lacking. This study aims to investigate the effect of the subjective mystical experience created by subanesthetic doses of intravenous ketamine on MDD.

Methods
In this prospective, observational study, approximately 20-30 adults (ages 18 or older) will receive subanesthetic doses (0.5 mg/kg) of intravenous racemic ketamine. Inclusion criteria include an established diagnosis of MDD, evaluation by treating psychiatrist, and an absence of previous psychedelic substance use. The subjective mystical experience will be evaluated using the Mystical Experience Questionnaire 30 (MEQ30), and depressive symptoms will be evaluated using the Montgomery Asburg Depression Rating Scale (MADRS) and the self-administered MADRS (MADRS-S) survey. Data will be collected by written/computer surveys and phone/in-person surveys and will be stored in Redcap. Specifics of statistical analysis will be discussed with a statistician.

Results
Results are still being collected. We expect to find an inverse correlation between the subjective mystical experience and depressive symptoms, such that higher MEQ30 scores will be associated with lower MADRS/MADRS-S scores.

Conclusions
We expect the degree of the subjective mystical experience created by subanesthetic doses of intravenous ketamine to be associated with an improvement in MDD symptoms. These findings will provide further insight into the mechanism of action of intravenous ketamine, which may advance its use in the clinical environment for MDD and, with future studies, perhaps a variety of other mental health conditions and pain syndromes.

Abstract #18

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Robotic vs. Laparoscopic excision of gastrointestinal stromal tumors: The experience of a regional institution

Background/Purpose
Gastrointestinal Stromal Tumors (GISTs), are uncommon gastric tumors with new diagnoses between 4000 and 6000 per year. The most common mesenchymal tumor of the digestive tract, GISTs are most often found in the stomach or small intestine; however, they can occur anywhere in the gastrointestinal tract. While identified mutations in these tumors can be effectively controlled with chemotherapeutic agents, the only curative treatment is complete surgical resection. Surgical resection has traditionally been performed as open or laparoscopic depending on location, size, and growth pattern; recently, the introduction of robotic surgery has revolutionized the minimally invasive approach. This study aims to evaluate the efficacy of Robotic surgery as an alternative when compared to laparoscopic as a means for minimally invasive surgery.

Methods
A retrospective study was performed on all patients diagnosed with GIST at a single institution between January 1, 2005 through February 30, 2022.

Results
Overall, 232 patients that underwent surgical resection were retrospectively evaluated; 73 underwent open surgery, 118 laparoscopic resections, and 41 robotic resections. The majority of GISTs studied were located within the stomach (74%) or small bowel (24%) with the remaining being located within the esophagus or colon. Initial analysis noted longer average operating times but reduced intraoperative blood loss and reduced length of hospitalization when comparing robotic resection to laparoscopic.

Conclusions
Minimally invasive surgery utilizing robotic systems provide an opportunity to provide effective curative treatment to GIST patients while reducing length of hospitalization, minimizing intraoperative complications, promoting optimal patient outcomes.

Abstract #4

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Ankle Range of Motion Following Surgical Correction of Early Relapse in Clubfoot

Background/Purpose

The current standard of care for clubfoot deformity involves Ponseti casting, heel cord tenotomy, and bracing. Recurrence, however, is common and often requires repeat heel cord tenotomy, posterior release (PR) of the ankle, and transfer of the anterior tibialis (ATT). The primary objective of this study was to examine clinical and radiographic outcomes comparing two surgical methods, ATT performed in isolation versus simultaneous ATT and PR, for the management of recurrent clubfoot deformity in a pediatric population.

Methods

A retrospective review was performed to identify patients who underwent ATT in isolation and ATT with PR for patients with recurrent clubfoot deformity after initial Ponseti casting. Post-operative follow-up endpoints included patient ankle range of motion (ROM), radiographic measures, and pedobarography (PEDO) loading patterns. Linear mixed effects models were used to compare outcomes for surgeries in isolation versus surgeries not in isolation.

Results

Results indicate that surgeries in isolation had a significantly greater PEDO lateral loading than surgeries not in isolation after accounting for correlations within patients ($p = 0.029$). Regarding radiographic results, surgeries in isolation had significantly lower calcaneal pitch than surgeries not in isolation after accounting for correlations within patients ($p = 0.002$). Additionally, surgeries in isolation had a significantly greater tibiocalcaneal angle than surgeries not in isolation after accounting for correlations within patients ($p = 0.033$). No statistically significant differences in the ROM outcome of ankle dorsiflexion with knee extended were found between ATT in isolation versus ATT with PR.

Conclusions

No significant differences in ankle ROM were identified between the two surgical strategies. Radiographic outcomes in those feet undergoing simultaneous ATT and PR resulted in more normal measures of the calcaneal pitch and tibiocalcaneal angles. Our findings show simultaneous ATT and PR can be safely performed with expected good results in the management of recurrent clubfoot.

Abstract #65

Cameron Whitacre

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Efficacy of Platelet-Rich Plasma Injections in the Management of Large-Joint Osteoarthritis: A Review

Background/Purpose
Osteoarthritis (OA) is the leading cause of chronic pain and disability affecting an estimated 595 million people or 7.6% of the global population. While joint arthroplasty is the current gold-standard, patients often desire less invasive alternatives. Platelet-rich plasma (PRP) has shown promise in early OA-symptom management. This study aims to evaluate the role of PRP in improving pain and function in patients with large-joint OA.

Methods
A PubMed literature search was performed in July 2024. MeSH terms included “Osteoarthritis” and “Platelet-Rich Plasma.” Inclusion criteria were human randomized controlled trials and papers in English. Pain and function outcome measures were extracted and compared. Scores were converted to percent change from baseline at 6, 12, and ≥18 months. Number of injections and leukocyte concentration were also evaluated.

Results
103 studies were identified and 44 were excluded, leaving 59 studies for analysis. 91% (N=54) investigated the impact of PRP on knee OA. In patients with knee OA, improvement in pain scores with PRP ranged from 4.10-75%, 5.76-76%, and -14.95-51.16% at 6, 12, and >18 months respectively. Improvements in function ranged from 1.91-76%, 2.14-77%, and 4.09-61.08%, respectively. Maximum percent change with PRP was higher than any control interventions. These results were not replicated in shoulder, hip, or ankle OA. Three PRP injections had the highest maximum percent change from baseline in pain (4.1-75%, 6.01-76%, and -14.9-38.10%, respectively) and function (1.91-76%, 2.73-77%, and 4.09-61.08%, respectively) compared to one, two, five, or six injections. Leukocyte-poor PRP had greater improvement in pain (0-75%, 9.25-76%, and 30.45-51.16%, respectively) and function (1.91-76%, 2.73-77% and 18.32-61.08%, respectively) compared to leukocyte-rich PRP.

Conclusions
These results support the use of PRP for the management of knee OA leading to improvements in both pain and function with 3 injections and LP-PRP yielding the greatest improvements.

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Abstract #74

Joshua Wiggins

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Dissecting the Impact of Robotics: An Investigation of Nontechnical Skills in Robotic-Assisted Surgery

Background/Purpose
Poor nontechnical skills (NTS) of a surgical team have been associated with detrimental surgical outcomes and patient safety. NTS are cognitive and social skills, such as communication, teamwork, and situational awareness, that impact performance. Robotic-assisted surgery (RAS) places unique demands on the NTS of surgical team members, as the technology physically distances team members in the operating room and reduces the ability to communicate non-verbally. Limited NTS assessment tools for such procedures are available, and are susceptible to observational bias, thus, there is a need for objective measurements. This study aims to identify the critical NTS required of each team member throughout robotic-assisted procedures and lay the groundwork for the development of a validated NTS assessment tool that utilizes objective physiological metrics.

Methods
Human factors and ergonomics approaches to investigate RAS were completed. A hierarchal task analysis (HTA) and cognitive task analysis (CTA) for robotic-assisted procedures was completed to decompose the steps of two robotic surgeries and understand the thought processes and NTS required by each surgical team member, to identify which objective metrics can be used to measure NTS.

Results
Preliminary results show that for the surgeon, the demand for effective closed-loop communication increased while at the robotic console due to limitations in non-verbal communication, particularly when coordinating instrument swaps with the surgical technician. The study also identified the need to systematically investigate ergonomics, which encompasses proper console adjustment and monitor placement to limit musculoskeletal strain, as a new NTS category especially relevant to RAS. These can be measured through wearable, non-intrusive motion tracking sensors.

Conclusions
Future work includes testing a novel NTS assessment tool derived from the findings of our HTA and CTA and completing data collection with sensors in RAS. These will contribute to developing better NTS assessments and training to promote effective teamwork in surgery.

Abstract #37

Victoria Wilson

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Lifestyle Interventions for Sarcopenia: An Investigation of Sex and Gender Differences

Background/Purpose
Sarcopenia, a condition characterized by gradual reduction in muscle mass and strength, is associated with significant disability and mortality. Current recommendations center on adoption of healthy lifestyle modifications such as resistance training and adequate protein intake. This review aims to assess the literature for sex- and gender-differences in sarcopenia across a broader range lifestyle interventions including nutrition, exercise, quality sleep, supportive social connection, effective stress management, and reduction of risky substances.

Methods
A systematic search was performed in PubMed using the Sex and Gender Specific Search Tool developed by Texas Tech University for literature published through July 2024. Data was filtered using search terms relating to sarcopenia, sex- and gender-differences, nutrition, physical activity, stress management, risky substances, sleep, social connection. Results were screened, and relevant studies were selected for further analysis.

Results
Of the 195 articles returned by the database, 44 included sex- and gender-differences, sarcopenia, and lifestyle medicine interventions: nutrition (14), physical activity (26), risky substances (3), quality sleep (1). Many studies illustrated the importance of resistance training and adequate protein intake, with sex and age differences. For instance, food insecurity was associated with increased sarcopenia risk in females of any age and elderly males. Another study emphasized a pronounced risk in younger women with low HDL levels and low protein intake. Regarding physical activity, a significant association between resistance training and sarcopenia was found only in men. Other literature demonstrated that older women benefited from resistance training combined with adequate protein intake.

Conclusions
While numerous studies indicate gender differences in the impact of physical activity and nutrition in preventing sarcopenia, their heterogeneity complicates drawing any meaningful conclusions. Further research is needed to establish clearer evidence-based dietary and exercise guidelines for sarcopenia tailored to both gender and age.

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Abstract #109

Caroline Wright

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Exercise is Medicine: Sex Differences in the Impact of Physical Activity on Depression

Background/Purpose
Depression is the second most common mental health disorder experienced by US adults, affecting more than 21 million adults annually. As the understanding of the pathophysiology of depression continues to evolve, research aims to understand sex differences in the disorder and how lifestyle factors, such as physical activity, have an impact on symptoms. Sex-specific research to further elucidate the relationship between physical activity and depression has the potential to shape clinical recommendations for treatment and prevention of depression.

Methods
To evaluate the current understanding of sex differences in the impact of physical activity on depression, a systematic review of literature was performed using a sex and gender search tool developed by the Sex & Gender Specific Health Task Force at Texas Tech University. It was used to identify PubMed articles that mentioned MeSH terms related to “sex” or “gender”. Results were further refined by adding required search terms “depression” and “exercise” or “physical activity”. All 179 studies that met criteria were reviewed.

Results
Observational research reveals sex differences in the impact of physical activity on depression. Women received a greater reduction in depression symptoms than men when completing physical activity. Sex differences were greater in older adults (70+). However, when physical activity is sub-divided into different activities and average total time of activity completed per week, results between the sexes became more nuanced. In some studies, men had a greater reduction with weightlifting, while women experienced a greater reduction with walking.

Conclusions
The benefit of physical activity on depression symptoms is nuanced and differs between the sexes. Continued research to further understand sex differences in the relationship between of levels and types of physical activity and its effects on symptoms of mild, moderate, and severe depression will allow medical practitioners to provide sex-specific recommendations on the level of activity needed to reduce depression symptoms.

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Abstract #122

Campbell Yates

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Putting Our Foot Down on Opioid Dependency: Reduction in Postoperative Opioid Use Following Lower Extremity Amputation Performed with a Nerve Block

Background/Purpose

Nearly 200,000 lower extremity (LE) amputations are performed in the United States each year, most of which are due to overwhelmingly common conditions such as diabetes, vascular disease, and infection. High rates of morbidity, mortality, and prolonged postoperative opioid use are among the highest concerns for the physicians performing the amputations, and for the patients receiving them. To decrease the rates of perioperative morbidity and postoperative opioid use, some physicians have taken to using sedation/monitored anesthesia care (MAC) anesthesia with blocks for these procedures. Compared to general anesthesia, nerve blocks have been shown to decrease postoperative pain scores, narcotic use, and pulmonary complications. This retrospective study aims to determine if sedation/MAC anesthesia with block reduced the quantity of opioids used by patients after LE amputation when compared to general anesthesia.

Methods

The electronic medical records (EMRs) of 154 vascular patients who are above the age of 18 and have undergone LE amputations (above and below knee) at Prisma Health Upstate between March 2023 and March 2024 are being reviewed for the type of anesthesia used (general or MAC), inclusion or lack of nerve block used, postoperative opioid use (in MME) both in hospital and after discharge, and postoperative morbidity/mortality.

Results

It is anticipated for this study to find that the use of sedation/MAC anesthesia with nerve block during LE amputations will be associated with decreased perioperative mortality and postoperative opioid use, compared to those performed under general anesthesia.

Conclusions

Opioid dependency and abuse have been consistently growing public health concerns, and surgery has continued to be a major contributor to the prescribing of opioids. The broader goal of this study is to help guide anesthetic choices with the intention of lowering opioid usage following LE amputations in an effort to improve patient quality of life.

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