MERITUS SCHOOL OF OSTEOPATHIC MEDICINE
Meritus
MARYLAND

Inaugural Meritus Scholar-Con Abstracts

March 13, 2025

Clinical Research, Quality Improvement, or Health Systems Science

1.1. Association Between Psychiatric Comorbidity and Symptoms of Major Depressive Disorder: Findings from NIMH CAT-D Study

Faisal Akram, MBBS

Major depressive disorder (MDD) is a categorical diagnosis characterized by heterogenous symptoms and high psychiatric comorbidity. Prior research has shown that psychiatric comorbidity alters the disease course and treatment outcomes of MDD. The aim of this study is to explore the association between psychiatric comorbidity and specific symptoms of MDD. Dataset was obtained from the National Institute of Mental Health Characterization and Treatment of Adolescent Depression (NIMH CAT-D) study. The NIMH CAT-D study is an ongoing longitudinal study at NIMH examining the development and course of depression among adolescents. For the purpose of secondary analysis, clinician ratings on the Kiddie Schedule for Affective Disorders and Schizophrenia (KSADS) were utilized to estimate the lifetime prevalences of common comorbid disorders including generalized anxiety disorder (GAD), separation anxiety disorder, panic disorder, attention-deficit hyperactivity disorder, post- traumatic stress disorder (PTSD), tic disorder, obsessive compulsive disorder (OCD) and social anxiety disorder. Chi-square analyses were performed to explore the associations between individual comorbid disorder and specific symptoms of MDD. Results showed that depressed individuals with ADHD had higher odds of having psychomotor abnormalities ($p = 0.004$) and appetite disturbance ($p = 0.04$). Whereas depressed individuals with GAD had higher odds of having low energy ($p = 0.03$), irritability ($p = 0.03$), and sleep disturbance ($p = 0.02$). Although there were numerical differences, no other psychiatric comorbidity was significantly associated with a specific symptom of MDD. These findings suggest a significant impact of comorbid psychopathology on depressive symptomatology and warrant further research into disease course, prognosis, and treatment outcomes in relation to psychiatric comorbidity

1.3. Implementing Fluoride Varnish Treatment for Pediatric Patients in a Family Medicine Residency Clinic

Ariel Lim-Sharpe, DO; Joseph Outmezguine, MD

Despite its importance, the application of fluoride varnish—a proven preventive measure for dental caries—has not been consistently integrated into primary care settings. This QI project aims to improve the rates of fluoride varnish application for eligible pediatric patients within a family medicine residency clinic. The project was implemented in several phases, beginning with educational sessions for providers and the development and integration of a standardized protocol. The PDSA method was employed using tests of change such as flyer placement in the clinic for provider awareness, smart phrase integration into EMR templates, and reminding of individual medical staff and providers. Data on fluoride varnish application rates, parental/guardian reasons for declining fluoride varnish, and provider adherence to the protocol were collected and analyzed over a twenty-week period. 157 pediatric patients who were seen during this timeframe were considered eligible for fluoride varnish treatment. Results indicate a

significant increase in the rate of fluoride varnish application from baseline (median 25%, mean 27.57%). The most effective test of change was sending personal reminders. These interventions have helped our residency clinic establish a robust protocol for fluoride varnish treatment, allowing us to contribute to improved dental health for the pediatric patients in our community. This project highlights the potential for integrating dental health initiatives into primary care settings, thereby reducing the burden of dental caries among children, especially those who have not yet seen a dentist. In the future, we hope to streamline this process by incorporating a section on fluoride into the "Pediatrics" portion of the EMR.

1.4. Meritus Health's Alcohol Withdrawal Protocol for the ED: A Novel Protocol for the Management of Alcohol Withdrawal

Heather P.M. Theibert, DO; Marsha A. Hickey, BSN, RN, CCM; Joshua T. McClain, MD; Matthew G. Wagner, MD

Current guidelines lack objective measures for the management of alcohol withdrawal in the emergency department (ED). Clinicians are presented with the difficult task of treating this condition with subjective guidance. This group utilized current guidelines and expert knowledge to create an alcohol withdrawal protocol for the ED delineating management decisions with objective criteria. A literature search was completed on PubMed and Google searching for guidelines for alcohol withdrawal. A combination of organization guidelines, opinion/position papers, and individual hospital protocols was used to create this protocol. In the areas where objective answers could not be obtained from current protocols, expert guidance was employed via informal survey of addiction medicine-focused physicians. A novel protocol was made delineating steps to manage those at risk for alcohol withdrawal. This protocol was made into a digestible flowsheet, and changes to Meritus's current standards of care were communicated to providers via a tip sheet. This protocol has driven initial change in how withdrawal cases are managed in the ED and other units. Further study is planned to determine how the protocol may change lengths of stay, rates of return to ED, and admission rates to various hospital units. Meritus Health's novel alcohol withdrawal protocol for the ED setting assists clinicians with a more objective tool for management and disposition of patients at risk for alcohol withdrawal.

1.5. The Impact of Obesity on Surgical Outcomes in Trauma Patients with Penetrating Injury: A Retrospective Analysis

Grace Perry, BS, OMS-III; Danielle Strawn, DO; David Metcalf, MA; Sylvester Paulasir, MD, MBA, FACS

Obesity has become an epidemic in the United States, significantly contributing to morbidity and mortality. The CDC classifies body mass index (BMI) into underweight (<18.5), normal weight (18.5–25), overweight (25–30), and obese (>30). Obesity-related health burdens include an estimated 300,000 deaths annually and $190 billion in healthcare costs. Trauma is the leading cause of mortality in individuals under 46 years of age. Prior studies suggest that obesity exacerbates trauma outcomes. This study evaluates the impact of obesity on postoperative mortality and hospital outcomes in trauma patients undergoing thoracic or abdominal

surgery.This retrospective cohort study analyzed data from the Trauma Quality Improvement Program (TQIP) database (2007–2017). Inclusion criteria encompassed adult patients (>18 years) who sustained thoracic or abdominal trauma requiring operative intervention. Patients with primary head or extremity injuries, as well as those undergoing minor laceration repair, were excluded. Pregnant women and elderly patients were included, while incarcerated individuals were excluded due to their vulnerable status. The primary outcome was mortality, with secondary outcomes including hospital length of stay (LOS), ventilator days, and ICU days. Statistical analyses were conducted to assess significance across BMI categories. The study population consisted predominantly of males, accounting for over three-fourths of the trauma cases. The overall mortality rate was 9.0%, with significant variation across BMI categories ($p=0.004$). Mortality rates were 4.3% in underweight patients, 3.9% in normal-weight patients, 4.4% in overweight patients, and 5.2% in obese patients. Hospital length of stay (LOS) also demonstrated a statistically significant difference ($p<0.001$), with underweight patients staying an average of 11.8 days, normal-weight patients 9.9 days, overweight patients 10.7 days, and obese patients 12.1 days. Additionally, ventilator dependency varied significantly among BMI groups ($p<0.001$), with obese patients requiring prolonged ventilatory support compared to normal- weight individuals. ICU length of stay ($p<0.001$) was similarly affected, with normal-weight patients spending an average of 6.1 days in the ICU, whereas obese patients remained for 8.2 days. Obese and overweight patients undergoing operative intervention for thoracic or abdominal trauma experience significantly worse outcomes, including higher mortality, longer hospital stays, increased ventilator dependence, and extended ICU stays compared to normal-weight individuals. Given the rising obesity epidemic, tailored perioperative management strategies are essential to mitigate complications and improve trauma outcomes in this high-risk population.

1.6. Increasing Pneumonia Vaccination Rates in a Family Medicine Residency Clinic

Viraj Patel, DO; Justin Brandt, DO; Daniel Deaton, MD, FAAFP

Pneumonia vaccination is a necessary public health intervention to prevent severe respiratory infections. Despite its importance, vaccination rates in clinical settings often fall below recommended benchmarks, leaving patients at increased risk of preventable illnesses. This quality improvement project aimed to increase pneumonia vaccination rates among eligible patients within the family medicine residency clinic. Increase pneumonia vaccination rates among eligible patients within the family medicine residency clinic to 30%. A driver diagram was developed to inform the implementation of sequential quality improvement Plan-Do-Study- Act (PDSA) cycles. Interventions included targeted education for providers, reminders integrated into the electronic health record system, and clinic-wide visual prompts. Vaccination administration was followed weekly and entered into a run chart. The clinic observed a brief yet measurable increase in vaccination rates, though changes were not sustained. This project demonstrates the effectiveness of combining provider education, system-level reminders, and visual cues in improving vaccination rates, and the need for sustained intervention to maintain progress. This model may be adaptable to produce sustained change and quality improvement in addressing health maintenance gaps.

1.7. Examining the Connection Between Adverse Childhood Experiences and the Development of Fibromyalgia

Ashley Moats, DO; Lawrence Barnoski, DO

Fibromyalgia is a multifactorial condition with unclear etiology. Adverse childhood experiences (ACEs) have been hypothesized to influence its development through mechanisms involving neuroplasticity and stress response dysregulation. Fibromyalgia is positively correlated with the presence of ACEs. A literature review was conducted using PubMed to explore the relationship between ACEs and fibromyalgia. Search terms included "adverse childhood experiences," "fibromyalgia," and "neuroplasticity." Articles meeting inclusion criteria were assessed for reliability and relevance to the research objective. Evidence suggests a statistically significant prevalence of ACEs among individuals with fibromyalgia. Patients with a history of ACEs exhibited increased symptom severity and a greater likelihood of structural brain changes associated with chronic pain. These findings highlight the potential influence of ACEs on the development of fibromyalgia and suggest potential benefits of targeted trauma-informed interventions. Given the limitations of the current evidence, future studies are recommended to evaluate this relationship further.

1.8. Increasing Flu Vaccination Rates in a Family Medicine Residency Clinic

Ali Zarandazchi, MD; Paige Cobb, MD; Daniel Deaton, MD, FAAFP

Influenza remains a significant public health concern, especially in high-risk patients. Despite established guidelines recommending annual flu vaccination, adherence is difficult in an era with increasing vaccine hesitancy amongst the general population. This quality improvement project aimed to increase flu vaccination rates among patients seen at the family medicine residency clinic by implementing targeted interventions to promote vaccine discussions and administration. A driver diagram was developed to inform the implementation of sequential quality improvement Plan-Do-Study-Act (PDSA) cycles. Initial steps included placing visual reminders in clinic pods and providing personalized prompts to the providers via the electronic health record (EHR). Vaccination rates were tracked monthly and compared to prior flu seasons.
Baseline vaccination rates showed lower-than-desired uptake. Following the interventions, flu vaccination rates increased progressively, with the highest gains observed in January (58% increase) and February (57% increase) compared to the prior season. This project demonstrates that clinic-based interventions, such as visual reminders and EHR prompts, can significantly impact flu vaccination rates. Future improvements should focus on sustaining gains through workflow integration and expanding patient education efforts.

1.9. Improving Utilization of PHQ-9 and GAD-7 Scoring in a Family Medicine Residency Clinic

Talia Smith, DO; Ralitza Tacheva, MD; Daniel Deaton, MD, FAAFP

Depression and anxiety are among the most common mental health conditions seen in primary care. Standardized assessments, such as the Patient Health Questionnaire-9 (PHQ-9) and Generalized Anxiety Disorder-7 (GAD-7), screen for pathology, grade disease severity, and guide treatment. However, their implementation in clinical practice is inconsistent. This quality improvement project aimed to increase the use of PHQ-9 and GAD-7 scoring by 10% and 15% respectively from baseline within one year. A driver diagram was developed to inform the implementation of sequential quality improvement Plan-Do-Study-Act (PDSA) cycles. Strategies to meet aims included staff education on the importance of PHQ-9 and GAD-7 scoring, workflow modifications to incorporate reminders in the electronic health record (EHR), and promoting collaboration between providers and medical assistants. Data were collected monthly to assess changes in scoring rates. Baseline data indicated significant month-to-month variability in the use of PHQ-9 and GAD-7 scoring. Following the interventions, GAD-7 usage increased by 15% from baseline by the end of the project. PHQ-9 scoring saw similar improvements, with staff education and EHR integration identified as the most efficacious interventions. Both scoring tools demonstrated usage improvements after initial implementation efforts, though staff attrition and clinic changes negatively impacted screening frequency. Targeted interventions, such as workflow integration and staff education, can improve the implementation of mental health screening tools in primary care. Future efforts should focus on maintaining staff cohesion and incentivizing consistent use to maintain improvements in screening rates.

1.10. Trauma Patient Assessment Performance Improvement KATA

Kyle N. Remick, MD, FACS; Pathya Kunthy, MPH; Tamara C. Baughman, BSN, RN, CEN, TCRN

Optimal outcomes for injured patients depend on an organized approach to hospital trauma patient assessment (TPA). The well-known KATA method provides continuous process improvement with steps including eyes-on analysis of processes, identification of barriers, and an iterative cycle of single changes to work towards a target condition (TC). The Meritus Medical Center (MMC) applied the KATA method to our Level III trauma performance improvement (PI) program to decrease ED length of stay via a TC of decreasing time from arrival to CT scan for trauma patients. The TC is arrival time to CT scan for level 1 trauma activations with a stable primary survey ≤10 minutes. The baseline in FY23 was 26 minutes. Variability in EMS reporting and inconsistency of duties were identified as obstacles during the Trauma Patient Assessment process. To address these obstacles, successful steps included implementation of the EMS MIST hand-off report, trauma bay roles, and installation of a digital clock. EMS MIST report decreased handoff times. Defining roles and responsibilities decreased TPA time. Installing a clock in the room raised time awareness. Results of each step are visualized on a run chart. Use of the KATA method allowed the trauma program to reach the TC of time to CT scan ≤10 minutes. This is the first example of the KATA methodology being used for trauma PI. KATA will be considered for use in other PI initiatives as it provides a framework for efficient change that can benefit medical care of the injured.

1.11. A Preliminary Analysis of Low-Titer O-Negative Whole Blood Use at Meritus Medical Center: A Quality Improvement Review

Kyle N. Remick, MD, FACS; Grace Perry, BS, OMS-III; Junius A. Rosario, BS, OMS-III; Tamara C. Baughman, BSN, RN, CEN, TCRN

Resuscitation with blood is a critical intervention for hemorrhagic shock, proven to be life-saving in military and civilian settings. To enhance trauma care, Meritus Medical Center (MMC), a Level III Trauma Center, recently implemented a Low-Titer O Whole Blood (LTOWB) program.This study reviews the program's first three months as part of MMC's trauma performance improvement process. The implementation of the Low-Titer O Whole Blood (LTOWB) program at Meritus Medical Center (MMC) will improve clinical outcomes, including reduced mortality and enhanced trauma care efficiency, in patients with hemorrhagic shock. A retrospective review of de-identified patient records was conducted. All MMC patients who received LTOWB from September 11, 2024, to January 31, 2025, were included. Data collected included patient demographics, transfusion indications, vital signs, laboratory values, blood product usage, massive transfusion events, disposition, and hospital outcomes. Trauma patient data also included Mechanism of Injury (MOI) and Injury Severity Score (ISS). Four trauma patients received LTOWB: three with blunt injuries (75%), one with a penetrating injury (25%). The mean transfused LTOWB was 4.6 units (range: 1–10). One patient required massive transfusion (11 LTOWB, 49 additional blood products) and was the only trauma mortality. Additionally, five non-trauma patients received blood, with 60% receiving LTOWB. The Low-Titer O Whole Blood (LTOWB) program at Meritus Medical Center (MMC) shows promise in improving outcomes for patients with hemorrhagic shock, especially in trauma care. Early results indicate that LTOWB is effectively used in both trauma and non-trauma patients, with trauma patients, particularly those with blunt injuries, benefiting from its use. While one trauma patient required a massive transfusion and was the only related mortality, the program suggests LTOWB could reduce mortality and blood product usage. Ongoing data collection will help refine transfusion protocols at MMC, optimize patient outcomes, and potentially serve as a model for other level III trauma centers seeking to enhance resuscitation strategies.

1.12. Bridging the Gap Between Inpatient and Outpatient Communication of Malnutrition

Amy Rost, DO; Uvindu Waniachchige, DO; Kelly Bright, RD; Daniel Deaton, MD, FAAFP

Malnutrition is associated with higher in-hospital mortality, increased 30-day readmission rates, and elevated healthcare costs. Effective communication of malnutrition diagnoses from the inpatient setting to the outpatient setting is necessary for continuity of care. This quality improvement project aimed to increase documentation of malnutrition diagnoses by resident physicians in discharge summaries to at least 80% for patients meeting diagnostic criteria. Dietitians performed nutrition-focused physical exams (NFPEs) to identify patients who met criteria for moderate or severe malnutrition during inpatient admission. Patient data were tracked manually and compared to discharge summaries for documentation accuracy. To address gaps, dietitian assessments were documented in a flowsheet column within the electronic health record (EHR), enabling the creation of a Smart Phrase that automatically pulled malnutrition diagnoses into the standardized resident discharge summary template. Baseline data revealed documentation

rates of 50% (4/8), 40% (2/5), and 28.6% (2/7) prior to the Smart Phrase implementation. Following implementation, documentation improved to 80% (4/5) and 91.7% (11/12). After ensuring all residents used the standardized discharge summary template, malnutrition documentation achieved 100% consistency for the following 3 months (6/6, 6/6, and 8/8). Implementing an automated Smart Phrase in a standardized discharge summary template significantly improved the accuracy and consistency of malnutrition documentation by resident physicians. This initiative highlights the value of integrating dietitian assessments into EHR workflows and demonstrates the efficacy of automated EHR changes in capturing important clinical data.

1.13. Surgical Outcomes in Acute Cholecystitis: A Gender-Based Retrospective Analysis

Krupesh G. Patel, OMS-III, MS; Chase Stauffer, DO; David Metcalf, MA; Sylvester Paulasir, MD, MBA, FACS

Acute cholecystitis incidence and risk factors are well established, particularly among females. While male patients are hypothesized to develop more severe disease due to delayed presentation, the extent of gender-based differences in complications remains unclear. Male patients will have longer operative times and worse secondary outcomes, including intraoperative complications, hospital length of stay, surgical site infections, and readmission rates. Retrospective data from the Michigan Surgical Quality Collaborative (MSQC) was analyzed for patients ≥18 years who underwent laparoscopic cholecystectomy for acute cholecystitis. Open cholecystectomy cases were excluded. The primary outcome was operative time as a surrogate for disease severity. Secondary outcomes included intraoperative complications, hospital length of stay, surgical site infection, and readmission rates. A total of 16,250 patients met inclusion criteria, with 65% female. After adjusting for confounders, mean operative time was significantly longer for males (73 vs. 63 minutes, $p<0.001$). Hospital length of stay was also longer for males (3.2 vs. 2.6 days, $p<0.001$). Male patients had a 42% higher risk of surgical site infection (OR 0.58), though intraoperative complications and readmission rates were not significantly different. Male patients present with more severe cholecystitis, requiring longer operative times and hospital stays, and are at increased risk of surgical site infection. These findings highlight the need for heightened perioperative planning in male patients.

1.14. Assessing the Impact of Faculty Development on Didactic Teaching in a Family Medicine Residency: A Six-Month Follow-Up Study

Helen Harrington, DO; Daniel Deaton, MD, FAAFP; Ashika Chaluvadi, DO

High-quality, engaging didactic teaching is essential in residency education, yet maintaining consistency and effectiveness can be challenging. This study evaluated the impact of a targeted faculty development initiative on didactic teaching in a family medicine residency program over six months. We conducted two structured faculty development sessions covering adult learning theory and interactive teaching strategies, supplemented by faculty resources and feedback from a pre-intervention resident survey. Pre- and post-intervention surveys, administered six months apart, assessed changes in residents' perceptions of lecture quality and learning experience, as

well as faculty perceptions of their own teaching effectiveness, engagement, and persistent barriers. We also analyzed the degree of alignment between faculty self-assessments and resident feedback. While our findings offer valuable insight into the impact of faculty development on didactic teaching, several limitations should be considered. These include a small sample size, variability in respondent participation, and the introduction of a new PGY-1 cohort, which may have influenced results since they had no prior experience with the previous didactic structure. Additionally, the six-month follow-up period may not fully capture long-term changes or ongoing challenges. These factors should be considered when interpreting the findings and guiding future improvements.

Clinical Case Studies

2.1. A General Overview of New MIGS (Micro-Invasive Glaucoma Surgery)

Jessica McLean, RN; Sidney T. Chang, MD

During a multi-center study in which our site participated, we compared the use of the Goniotomy Kahook Dual Blade® and the implantable iStent® bypass treatment along with a cataract extraction and IOL implantation procedure. Two case studies were viewed in how Minimally-Invasive Glaucoma Surgeries (MIGS) may benefit a patient's vision, costs/needs of medications, and quality of vision. The potential benefits of Minimally-Invasive Glaucoma Surgeries (MIGS) approved by the U.S. Food and Drug Administration (FDA) include a decrease in the pressure of the eye and a decrease in the number of eye drop medications the patient is taking. MIGS procedures are being used in place of other surgeries which substitute for invasive surgeries such as a trabeculectomy or other drainage mechanisms such as a valve or tube. Subjects were voluntary and assigned to treatment groups by chance. Subjects studied were asked to come to our office for follow-up visits over the 12 months following surgery. Between 30 enrolled patients, 15 of them had undergone the KDB® treatment and 15 had undergone the iStent® treatment. After 12 months of monitoring our patients, 49% of the patients had either a decrease in glaucoma medications or they had stopped using all their glaucoma medications directed by the physician (Dr. Sidney T. Chang). Using MIGS is minimally invasive to the eye and may also decrease the amount of glaucoma medications being used. Although MIGS tend to be used with mild to moderate glaucoma diagnoses, some severe cases may benefit from MIGS.

2.2. Case Report: The Treatment of Chronic Pelvic Pain Utilizing Topical Amitriptyline-Ketamine Compound Cream

Chiemeka Onyima, MD, DABA; Junius A. Rosario, BS, OMS-III

Chronic pelvic pain (CPP) is a complex syndrome often associated with a variety of somatic, psychological, and functional impairments. This case report describes a 45-year-old woman with a history of CPP secondary to a traumatic delivery, who presented with persistent vaginal and perineal pain unresponsive to prior conservative therapies, including gabapentin and physical therapy. This case highlights the potential utility of compounded topical AMI-KET cream as part

of a multimodal treatment approach for CPP, particularly in patients who are unsuitable for or unwilling to undergo interventional procedures. Following initiation of a multimodal treatment regimen incorporating a compounded topical cream containing 2% amitriptyline (AMI) and 0.5% ketamine (KET), the patient reported substantial improvement in pain, functionality, and quality of life. While the cream was well tolerated initially, prolonged use led to adverse effects, including vivid dreams and nocturnal orgasmic contractions, necessitating reduced frequency of application. Despite this, the patient experienced continued significant pain relief and was able to resume daily activities with minimal impact on her quality of life. Further research is warranted to better define the role of topical AMI-KET cream in the management of CPP.

2.3. The Prevalence of Congenital Diaphragmatic Hernias in Patients with a 15q11.2 Microduplication

Andre Budianto, OMS-III; Rebecca Bilokon, OMS-III; Jennifer Read, OMS-III; Michael Watcher, OMS-III; Eleanor Smith, MD

A 15q11.2 microduplication is a rare genetic variation associated with cognitive deficits in childhood, including autism spectrum disorder, developmental delays, and sensory processing disorder. This duplication is typically inherited with varying levels of incomplete penetrance, though it may occasionally arise from de novo mutations. Consequently, individuals with the same mutation can exhibit widely different symptoms, even within the same family. As of 2019, only 70 individuals worldwide have been documented with this mutation, and just four of them have been reported to have a congenital diaphragmatic hernia (CDH). Here, we present a patient with this genetic variant and a CDH, along with a notable familial clustering of CDH's in the patient's brother, maternal uncle, and maternal grandfather. This case raises further questions about the potential role of 15q11.2 microduplication in diaphragmatic development and the inheritance patterns of CDH.

2.4. Case Study: Managing Type 1 Diabetes in a Patient With Paranoid Schizophrenia

Deekshitha Tella, OMS-III; Zainab Calcuttawala, OMS-III; Yousuf Almadhoun, OMS-III; Ayodeji Somefun, MD

Managing Type 1 Diabetes Mellitus (T1DM) in patients with paranoid schizophrenia presents unique challenges, particularly regarding insulin administration and medication adherence. This case highlights the complexities of coordinating care and emphasizes the importance of integrated treatment for patients with comorbid psychiatric and chronic medical conditions. A 36-year-old male with paranoid schizophrenia and poorly controlled T1DM was admitted with elevated glucose levels following an emergency petition due to violent behavior. His residential treatment center could not administer insulin and was concerned about his management of care, creating significant discharge barriers. During his four-week hospitalization, the patient underwent extensive diabetes education. Initially resistant, he eventually demonstrated competency in insulin administration with consistent reinforcement from nursing staff and was discharged with a continuous glucose monitor to support long-term adherence. Upon his improvement, the residential treatment center agreed to continue supervising the patient and to readmit him to the

center. This case underscores the multifactorial challenges of managing T1DM in patients with schizophrenia, including impaired insight, cognitive dysfunction, and metabolic effects of antipsychotic medications. The patient's history of medication nonadherence and lack of resources in his residential treatment facility highlighted gaps in coordinated care. Integrated approaches that address both psychiatric and medical needs are essential to improving outcomes and reducing the risk of diabetes-related complications. Multidisciplinary care strategies are critical for managing patients with schizophrenia and T1DM. Future research should explore sustainable interventions that promote medication adherence and long-term self- management in psychiatric populations to improve quality of life and reduce hospitalizations.

2.5. Case Report: Ocular Syphilis with Rapid Loss of Visual Acuity

Pathya Kunthy, MPH; John M. Roach, MD

Syphilis is caused by the spirochete, Treponema pallidum. In 2023, over 200,000 cases of syphilis were reported in the US, which was a 61 percent increase since 2019. Ocular syphilis is rare but is a growing concern given the rising incidence of syphilis. Delay in diagnosis and treatment can lead to vision loss. The aim of this report is to present a unique case of ocular syphilis. This is a case of a 58-year-old male in a large metropolitan city presented to an ophthalmologist complaining of floaters and blurry vision in both eyes. Vision with correction at initial visit was 20/20 OU. There was evidence of mild cells and flares in the anterior chambers for which the patient was treated with topical steroids. Over a few days, vision deteriorated to 20/100 OU, and optical coherence tomography (OCT) showed nodular changes in the photoreceptor layers. After testing positive for tertiary syphilis, visual symptoms resolved after intravenous penicillin G. Studies have documented rises in ocular syphilis with a hefty proportion of cases associated with men who have sex with men. Diagnosis of ocular syphilis is a challenge given its similarities in presenting symptoms to other ocular diseases such as uveitis, vasculitis, and optic neuritis. A lack of pathognomonic presentation makes it difficult to initiate timely testing and often leads to misdiagnosis or delayed diagnosis. Here we present a constellation of symptoms with physical findings as well as changes on OCT that should raise suspicion for ocular syphilis, especially in high-risk populations.

2.6. Superficial CD34-Positive Fibroblastic Tumor: A Case Study

Nishi Patel, BA; Susan Sharpe, MD

Superficial CD34-positive fibroblastic tumor (SCD34PFT) is a relatively new mesenchymal tumor type. First noted in 2014 by its distinctive nuclear pleomorphism, relatively low mitotic activity and CD34 immunohistochemistry, its prevalence is incredibly rare, with approximately 150 cases reported in the English literature as of 2024. Most cases of the tumor are found in adults between the ages of 18 and 40 years, originating primarily on the lower extremities. Overall, prognosis for patients with a SCD34PFT tumor is good, as the tumor is generally benign in nature, but has been previously noted to metastasize to regional lymph nodes. The following case study details the diagnosis of a SCD34PFT tissue mass in a 39-year-old woman. The patient initially presented to her PCP for what was believed to be a lipoma or cyst of the lower extremity.

Following excision of the lesion, immunohistochemistry testing revealed the mass to be Superficial CD34 positive fibroblastic tumor. However, pathological examination of the initial excision also demonstrated positive margins, and recommendation per previous literature was made for re-excision of the lesion to obtain negative margins. Despite SCD34PFT being a rare tumor type, discovered cases continue to increase in number. This case study aims to increase awareness and add to the limited literature on this infrequently diagnosed tissue type so that it may be included in future differentials in clinically relevant cases, and so clinicians may provide their patients with more clear answers and encouraging results following tissue excisions or biopsies.

2.8. Fixing a Broken Heart: A Case of Suspected Takotsubo Cardiomyopathy Presenting to the ED

Manuel Linarte, BS, OMS-III; Christopher Vaccari, MD

Takotsubo cardiomyopathy, also known as stress-induced cardiomyopathy, is a cardiac syndrome that mimics acute myocardial infarction (MI) with symptoms such as chest pain, elevated troponins, and ST-segment abnormalities on electrocardiogram (ECG). This case report describes a 76-year-old female with a significant psychiatric history who presented with chest pain radiating to her back and shoulders, along with nausea, vomiting and fatigue. Initial evaluations revealed markedly elevated troponins (643.8 to 2,442.4), echocardiographic findings of reduced left ventricular ejection fraction (20–25%), and systolic dysfunction of anterior and anteroseptal segments. Urgent coronary angiography was performed to rule out STEMI and NSTEMI, revealing no obstructive coronary artery disease. Differential diagnoses included Takotsubo cardiomyopathy, type 2 MI, and acute pericarditis. The absence of myocardial oxygen demand mismatch or recent viral illness helped exclude type 2 MI and pericarditis, respectively. Stress-induced cardiomyopathy was deemed the most likely diagnosis. Management included IV heparin, metoprolol, aspirin, clopidogrel, and PRN nitroglycerin for symptomatic relief, resulting in clinical stabilization. The patient was discharged and seen in the clinic a few days later for follow up. This case highlights the challenges in distinguishing Takotsubo cardiomyopathy from acute coronary syndromes due to overlapping clinical presentations. Imaging, particularly catheterization, plays a crucial role in diagnosis. Additionally, the patient's psychiatric history raises the possibility of lower thresholds for triggering stress-induced cardiomyopathy and potential medication-related contributions. Further research is needed to explore the interplay between psychiatric conditions, pharmacologic factors, and stress-induced cardiomyopathy in this unique patient population.

2.9. A Case Report: Goblet Cell Carcinoma of the Appendix
Krupesh G. Patel, OMS-III, MS; Asim Shabbir, DO

Goblet cell carcinoma (GCC) is a rare subtype of appendiceal neoplasm characterized by both glandular and neuroendocrine features. It accounts for less than 5% of appendiceal tumors, often presenting diagnostic and therapeutic challenges due to its aggressive behavior. This case report discusses a 62-year-old female patient who presented with diffuse abdominal pain and distension. Imaging revealed a large bowel obstruction in the sigmoid colon, pneumatosis of the ascending colon, and pneumoperitoneum. Exploratory laparotomy was significant for large bowel obstruction at sigmoid colon, proximal transverse colon perforation with carcinomatosis involving small bowel, large bowel and ovary. A subtotal colectomy, omentectomy, ileostomy, and a right salpingo-oophorectomy was performed. Histopathological investigation identified GCC of the appendix and subsequent staging was pT4bpN2pM1b. Postoperative recovery was complicated by abdominal fascial dehiscence which healed with the assistance of an ovine biological matrix. Adjuvant chemotherapy was initiated thereafter. As a complex cancer, GCC requires histopathological evaluation with certain markers including chromogranin A, synaptophysin, and mucin markers to differentiate it from other appendiceal tumors. With rapidly decreasing 5-year survival rate with advancing stage, management will include appendectomy and right hemicolectomy for localized disease, surgical debulking and intraperitoneal chemotherapy/HIPEC for peritoneal carcinomatosis, and systemic chemotherapy for metastatic disease. This case offers an understanding of the aggressive nature of this subtype of appendiceal cancer and the importance of histopathological evaluation and the need for a multidisciplinary approach to managing this rare malignancy. Early diagnosis and appropriate surgical management are important in optimizing the outcomes and survival for patients with GCC.

2.10. Robotic-Assisted Repair of a Concomitant Paraesophageal and Left Diaphragmatic Hernia
Krupesh G. Patel, OMS-III, MS; Stephen Kavic, MD; Mohammad Jamal, MD; Sridhar Gona, MHA, MS, BSPharm; Hugo J.R. Bonatti, MD

The vast majority of diaphragmatic hernias in adults are repaired using the laparoscopic approach. The robotic platform is increasingly accepted by foregut surgeons. The most common diaphragmatic hernias are hiatal hernia but defects may also occur at other sites. Concomitant combined defects are extremely rare and require special techniques including placement of a mesh. A 65 y/o female presented with a large symptomatic paraesophageal hernia – her body mass index was 35kg/m2. She complained of gastroesophageal reflux despite using a proton pump inhibitor, regurgitation, epigastric and back pain, shortness of breath, and nocturnal coughing spells. She was counseled regarding diet and weight loss and over the next 3 months she was able to drop 25 pounds and her symptoms improved somewhat. She underwent robotic assisted paraesophageal hernia repair. During exploration, a sizable sliding hiatal hernia was found, however, the fundus was incarcerated within a 4cm defect just lateral to the left crus. The peritoneum at the hiatal hernia was incised and the hernia contents were reduced, the sack was resected. The esophagus was undermined and dissected free and good intraabdominal length was obtained. Next the contents of the 2nd hernia were gently reduced after the gastrocolic ligament

was opened and the short gastric vessels were divided. As the cruroplasty pulled the left crus to the midline, primary repair was impossible and this defect was closed with coated mesh. A standard floppy Nissen fundoplication was created, and a PEG tube was placed to anchor the stomach in the abdomen. She had an uneventful early postoperative course and was discharged on day 2 after an upper GI series showed no leak or stenosis. She did well for a week but then inadvertently pulled the PEG tube out. She underwent exploratory laparoscopy and the gastric defect was staple closed. Further clinical course was uneventful, and she was well without signs of recurrence after two years. We report successful management of the rare condition of a double diaphragmatic hernia. The second defect needs to be closed tension free with a mesh due to the tension at the repairs to avoid failure and hernia recurrence.

2.11. First Case of Acute Cholecystitis due to Veillonella spp. and Report of a Series of Infections due to the Elusive Anaerobe at a Community Hospital Center

Junius A. Rosario, BS, OMS-III; Neerav Patel, MD, FRCS; Sridhar Gona, MS, MHA, BSPharm; Aaron George, DO; Stephen Kavic, MD; Hugo JR Bonatti, MD

The Gram-negative anaerobic cocci Veillonella spp are part of the human intestinal flora and rarely implicated in diseases. Its yield within the microbiome significantly increases with physical activity. Veilonella yield is increased in athletes due to high lactic acid levels and may even improve performance during endurance training. The organism should be added to the ever expanding spectrum of anaerobic pathogens involved in surgical infections. Following an indexcase of Veillonella cholecystitis, which has not been reported previously, our institutional database was searched for all infections caused by the pathogen during a 4-year period. All infections were successfully managed with surgical intervention and antibiotics such as Betalactams, Clindamycin and metronidazole. In contrast to the reported colonization preference within the microbiome of athletes, in our series middle aged and elderly men with multiple comorbidities were mainly affected.

2.12. A Case of Large B-Cell Lymphoma in a Patient with Morbid Obesity, Lymphedema, and Recurrent Cellulitis

Meghana Annadata, MD; Carmina Rogelio, MD; Daniel Deaton, MD, FAAFP

Patients with extreme morbid obesity face diagnostic challenges in the hospital. This case highlights the challenges in the case of a 40-year-old male with a BMI of 104, recurrent cellulitis and chronic wounds, culminating in the diagnosis of Diffuse Large B-Cell Lymphoma (DLCBL). A 40-year-old man with a history of morbid obesity, deep vein thrombosis, and lymphedema presented with fever and draining masses on his lower extremities. Examination revealed lichenified tissue and numerous exophytic nodules of the pannus and proximal thighs. Initial diagnosis was cellulitis and he responded to antibiotics. Imaging could not be done due to technical limitations, and biopsy was declined. On readmission he presented with hypercalcemia, sepsis, and non-healing wounds. Standard nursing care was complicated by habitus. On third admission biopsy confirmed DLBCL. The patient responded well to prednisone and urgent RCHOP chemotherapy administered in the inpatient setting but later passed away due to his

disease. The patient's case was complicated both by delayed biopsy and by system-level issues in providing care for an individual with a BMI of >100. Early recognition of lower extremity mass morphology, risk factors for DLBCL, and recognition of the positive predictive value of hypercalcemia for malignancy would have allowed for earlier diagnosis. This case exemplifies the diagnostic complexities in patients with obesity and lymphedema, particularly in the presence of atypical infections and persistent wounds. Early biopsy in the context of non-healing lesions may expedite diagnosis and treatment. This case also highlights the need to address body habitus-related challenges in hospitalized patients.

2.13. Hand Sanitizer Intoxication in Disguise: A Case Study

Evan Curry, MS; Michael Nickasch, MD; Heather P.M. Theibert, DO

Hand sanitizer ingestion occurs in the hospital setting, especially by those with alcohol use disorder. Despite its occurrence, the standard of care for ingestion is not well documented. Hand Sanitizer intoxication often presents with symptoms such as tachycardia, drowsiness, vomiting, and abdominal pain that can delay diagnosis and lead to serious consequences like seizure and coma. Our aim is to educate about the signs, management, and importance of identifying hand sanitizer ingestion by describing a case of a patient with a sudden onset altered mental status that resolved within 24 hours and was found to be from hand sanitizer intoxication. Patient is a 33-year-old female with a past psychiatric history of unspecified depressive disorder, alcohol use disorder, and generalized anxiety disorder was admitted medically for alcohol withdrawal. Patient was placed on CIWA protocol and, given IV thiamine with improvement in her withdrawal symptoms. On day 5 of her hospital stay, patient experienced a fall and was found with altered mental status. The patient's UDS was negative, and she returned back to her baseline within 24 hours. After being transferred to a Crisis Center for addiction treatment, patient revealed she had ingested 2 large cups of hand sanitizer before her fall. As hand sanitizer use has become essential for infectious disease control, knowledge of the complications of hand sanitizer ingestion and poison education should be widespread. Understanding hand sanitizer intoxication, how it presents, and its complications are important for early diagnosis, treatment, and prevention of further decompensation.

2.14. Massive Myocardial Infarction and Ventricular Rupture Following Laparoscopic Colectomy for Colorectal Cancer: A Devastating Complication

Siam Shabbir, BS; Manuel Linarte, BS, OMS-III; Sridhar Gona, MHA, MS, BS.Pharm; Aaron George, DO; Hugo J.R. Bonatti, MD

Laparoscopic surgery offers numerous advantages over open surgery, particularly for colon resections in benign and malignant diseases. While the incidence of surgical complications, particularly infections, is lower with the minimally invasive approach, the rate of postoperative medical complications, such as pulmonary embolism or myocardial infarction, remains unaffected. Massive myocardial infarction with ventricular rupture is an exceedingly rare and almost invariably fatal condition and has not been reported as a postoperative complication following laparoscopic surgery. A 75-year-old male presented with stool irregularities and blood

per rectum, leading to the discovery of a malignant lesion in the ascending colon. He was an active smoker but had no symptoms suggestive of coronary artery disease, such as chest pain or shortness of breath. After receiving cardiac clearance, he underwent laparoscopic right hemicolectomy. His intraoperative and early postoperative course was uneventful, with passage of gas on postoperative day 3 and a bowel movement on day 4. The following morning, the patient became diaphoretic, developed chest pain, shortness of breath and lost consciousness. Upon intubation and transfer to the ICU, an EKG confirmed acute myocardial infarction. A CT scan revealed contrast extravasation from the left ventricle, with developing cardiac tamponade. After discussing the poor prognosis with his wife, comfort care was initiated, and the patient passed away within an hour. To our knowledge, ventricular rupture following laparoscopic surgery or colectomy has not been previously reported. In long-term smokers, even in the absence of symptomatic coronary pathology, a more comprehensive cardiac workup may prevent further devastating complications.

2.15. Single Center Experience with Infections due to Raoultella: An Emerging Surgical Pathogen

Krupesh G. Patel, OMS-III, MS; John Kessler, MD; Sridhar Gona, MHA, MS, BSPharm; Aaron George DO, Hugo J.R. Bonatti, MD

Raoultella spp are Gram negative bacilli which were previously not distinguished from Klebsiella spp, however, genomic analysis led to creation of this new genus. This emerging pathogen seems to be more commonly implicated in biliary infections. Only limited clinical data on this organism are available. The aim of this study is to investigate newly emerging infectious pathogen (Raoultella spp) and identify potential risk factors in patients with biliary infections. Our institutional database was searched for all cases of Raoultella infections during a 4-year period. Isolation and identification of Raoultella was done using standard methods and the Matrix-Assisted Laser Desorption Ionization-Time of Flight Mass Spectrometry (MALDI-TOF MS). A total of 5 patients with infections due to the bacterium were identified. There were four women and one men with a median age of 70.5 (range 50.9 to 82.6) years; median BMI was 38 (range 33.6 to 40.1) kg/m2. All infections were monomicrobial. In three cases the organism was cultured from bile retrieved during cholecystectomy (heavy growth in 2 and light growth in 1 specimen). Two patients had acute calculous and one chronic calculous cholecystitis and laparoscopic cholecystectomy was uneventful in all cases. The remaining two cases involved a back and a finger abscess and in addition to moderate/heavy growth of Raoultella also normal skin flora was reported out. Raoultella ornithinolytica was isolated from one abscess all other specimens grew Raoultella planticola. Antibiotic treatment consisted of Betalactams such as Amoxicillin/clavulanic acid or Piperacillin/tazobactam of 3rd/4th generation cephalosporins. Modern identification techniques such as MALDI-TOF MS allow for detection of rare pathogens such as Rauoltella spp. The emerging pathogen causes serious most commonly surgical infections. Obesity may be a risk factor for this infection.

Biomedical and Translational Science

3.1. Examination of Umbilical Cord and Its Vessels in Preeclampsia

Elsabet Mohammed, MSc; Mekbeb Afework, PhD; Kiflom Tesfaye, MD; Wondwossen Ergete, MD; Amenu T. Wirtu, PhD

Preeclampsia increases the likelihood of umbilical vessel dysfunction at both macrovascular and microvascular levels, which are vital for fetal survival. However, the association between umbilical cord abnormalities and preeclampsia remains a topic of debate in recent research. Histomorphometric changes in umbilical vessels significantly affect the placenta's essential functions during fetal development, with abnormalities more common in preeclamptic mothers. This study was aimed to examine changes in the umbilical cord and its vessels from preeclamptic and non-preeclamptic mothers at two hospitals in Addis Ababa. Using seventy-five fresh placental specimens, changes were analysed through inspection and measurements, followed by microscopic evaluation of randomized sections. High-risk mothers exhibited significant reductions in umbilical cord diameter (mean 0.93 ± 0.29 cm), luminal diameter, and wall thickness of umbilical arteries, particularly in the fetal segment. Moreover, umbilical veins showed a progressive decrease in luminal diameter from the placental to fetal segments, with the most notable reduction in the placental segment's luminal diameter (Mean 5.43 ± 1.16 mm). The blood pressure of preeclamptic mothers was observed to be higher than that of low-risk mothers. Notably, their diastolic pressure (95.80 ± 11.69) was significantly elevated compared to the controls (75.20 ± 5.04). Mothers with preeclampsia experience significant shrinkage and dysfunction of umbilical cord vessels, increasing the risks to fetal survival compared to pregnancies with lower risks. These findings enable clinicians to detect complications early and implement timely interventions, thereby reducing the likelihood of adverse maternal or fetal outcomes in high-risk cases.

3.2. NLRP3 Inflammasome Activation by Amyloid Precursor Protein (APP695) and Its Swedish Mutant: Implications for Alzheimer's Disease Pathogenesis

Venkata Atluri, PhD, MSc; Samuel Kadavakollu, PhD, MSc; Braydon Black, BS; Nestor Cruz, BS; Sydney Sands, BS; Elizabeth Sarkisian, BS

Alzheimer's disease (AD) is a progressive neurodegenerative disorder affecting an estimated 6.7 million Americans aged 65 and older, with advanced age as the greatest risk factor. AD pathology is characterized by extracellular amyloid-beta (Aβ) plaques, intracellular Tau tangles, and neuroinflammation. This study investigates the role of the NLRP3 inflammasome pathway, activated by excessive Aβ production, in AD development, focusing on the Swedish mutant APP695 isoform (APP695SW). We hypothesize that APP695 and APP695SW stimulate the NLRP3 inflammasome cascade that activates caspase-1, promoting interleukin 1β (IL-1β), IL-18 secretion, and dysregulated inflammasome gene expression, leading to neuronal apoptosis and neurocognitive decline in AD patients. SH-SY5Y neuroblastoma cells, APP695-overexpressing SH-SY5Y cells (SH-APP695), and SH-SY5Y cells overexpressing the APP695SW mutant (SH-APP695SW) were co-cultured with primary microglial cells. APP695SW is known to enhance

aberrant amyloid precursor protein cleavage, increasing Aβ and Tau tangle levels. Cell lysates and supernatants were analyzed for APP, caspase-1, mature IL-1β, and IL-18 expression using Western blot and ELISA. Further, RNA from the cells was analyzed using the human inflammasome gene expression PCR array. Western blot analysis revealed significantly higher APP expression in SH-APP695 cells compared to SH-APP695SW cells. Additionally, cleaved IL-1β expression was significantly elevated in SH-APP695 cells but not in SH-APP695SW cells. No significant differences in IL-18 expression were observed across the groups. Of the 84 inflammasome genes analyzed, 7 were upregulated in APP-695, 9 were upregulated and 8 were downregulated in APP-695SW cells. APP695-overexpressing neuronal cells exhibited significantly higher APP and cleaved IL-1β expression compared to APP695SW mutant-expressing cells. These findings suggest a differential role of APP isoforms in inflammasome activation and AD-related neuroinflammation.

3.3. Impact of Suboccipital Release Osteopathic Manipulation on Autonomic Nervous System: A Study of Short-Term QT Interval Changes in Healthy Young Adults

Ryan Witczak, MS; Jennifer Kachelmeyer, MS; Kristina Cummings, DO

Osteopathic physicians utilize the Sub Occipital Release (SOR) technique to enhance wellness and regulate the Autonomic Nervous System (ANS). By improving the ANS function, SOR may reduce stress and increase blood flow, potentially relieving compression on the vagus nerve and boosting its activity in cardiac cells. The research aims to investigate SOR's effects on cardiac control, specifically assessing QT variability as a measure. A crossover design involved three groups: a control with no physical contact, a sham treatment, and a SOR group. The 12-lead EKG recordings measured intervals including QRS, QT, QTcB, JT, QTa, and QTend. The index of cardiac electrophysiological balance (iCEB) was assessed by evaluating QTcB and QRS duration. The analysis revealed no significant difference in QTa measurements between the V2 and aVF leads ($F(1.705, 34.11) = 1.294$, $P = 0.06$). Mean QTa values for the control, sham, and SOR groups were 96.29 ± 4.37 msec, 97.14 ± 5.85 msec, and 89.48 ± 4.62 msec respectively, with the SOR group showing a significant decrease ($F(1.705, 34.11) = 1.294$, $P = 0.05$). Variability in QTcb was also statistically significant ($F(1.410, 28.19) = 0.4429$, P=0 .051). The ratio of QTend to either QTc were 0 .26±0 .01 for control, 0 .25±0 .01 for sham, and O .19±O .01 for SOR. There was a moderate increase in both QT and QTcB intervals and shorter QTend intervals that may stem from increased vagal activity. The moderate rise in QTcB suggests that SOR might enhance repolarization phase promoting ventricular relaxation.

3.5. Spectrum of Pathogens involved in Eye Infections Observed at a Rural Hospital

Pathya Kunthy, MPH; Junius Rosario BS, OMS-III; Sridhar Gona MHA, MS, BSPharm; Aaron George, DO; Hugo J.R. Bonatti, MD

Eye and periorbital infections require immediate intervention and aggressive treatment to prevent loss of vision. The spectrum of pathogen involved in these infections is quite diverse. The aim is to characterize eye infections in a rural community hospital. Our institutional database was searched for all patients presenting with infections of the eyes during a 4-year period (September

2018 to December 2022). A total of 54 isolates from 44 patients (19m/25f) were identified. 19% were pediatric. Median BMI of the cohort was 29.1 (range 15.7-44.5) kg/m2. Of the specimens, 40% were labeled eye, 30% eyebrow/eyelid and 30% vitreous fluid. 37% were sent by ophthalmologists with 36% from primary care physicians, 18% from ED, and 9% from other services. Abscesses and wounds accounted for 18% of specimens, 58% from fluid collections or tissue. Endophthalmitis was the most common clinical diagnosis (13), and periorbital abscess and cellulitis accounted for 7 cases each. Microscopy of 41 specimens revealed WBC in 73%, Gram-positive cocci in 24% and Gram-negative rods 2% and Yeast 2%. Staphylococci were cultured in 80% of the specimens, streptococci in 9%, enterococci in 2%, Gram-negative rods in 12%, anaerobes in 5% and Yeast in 2% (Candida dubliniensis). In one case, Neisseria gonorrhea was isolated. Staphylococcus aureus was the most common pathogen with 24 isolates of which 13 being Methicillin resistant. One patient had a mixed infection with Stenotrophomonas maltophilia and Achromobacter xylosoxidans. Knowledge of the spectrum of pathogens causing eye infections is crucial for choosing the correct antibiotics when initiating empiric therapy.

3.6. Synergistic Role of Osteopathic Manipulative Therapy and Finasteride in Epigenetic Regulation of ChAT and SIRT1 Genes Expression: A Gateway to Alleviation of Symptoms Associated with Huntington's Disease

Churchill Ihentuge, PhD, MD, MSC, MBA

Huntington's disease is a neurodegenerative disorder with continuing involuntary movement anomalies, psychiatric symptoms, cognitive deterioration, and a reduced lifespan. The dysregulation of several genes had been implicated in pathophysiology of Huntington's disease including the choline acetyltransferase (ChAT) and Sirtuin-1 (SIRT1) genes. SIRT1 gene, a neuronal regulator of energy metabolism is beneficial in neurodegenerative disorders such as Alzheimer's disease, Parkinson's, and Huntington's diseases. Craniosacral therapy, a form of osteopathic manipulative treatment, causes a reduction in symptoms associated with stress, anxiety and depression and controls the expression of genes associated with neuropsychiatric disorder including the ChAT gene. We demonstrated the upregulation of SIRT1 gene expression through methylation following finasteride treatment. to investigates the combining effects of craniosacral osteopathic manipulative therapy and finasteride treatment on the methylation profiles of ChAT and SIRT1 genes and possible roles in alleviation of symptoms associated with Huntington disease. The differential methylation profile of ChAT and SIRT1 genes will be done using samples collected from participants with Huntington's disease and the clinical correlation compared before and after craniosacral therapy and finasteride treatment. The data analysis will be done using the SPSS analytical tool. The results will reveal the differential methylation profiles of ChAT and SIRT1 genes following the use of craniosacral osteopathic manipulation therapy and finasteride in treatment of Huntington's disease through epigenetic modulation of ChAT and SIRT1 genes including the clinical correlation. Craniosacral Osteopathic Manipulation when combine with finasteride could possibly play an adjuvant role in alleviating the symptoms of Huntington disease.

3.7 Epigenetic Effects on Altered Sperm Motility Initiation by Finasteride-Induced Modulation of Akt and CCND1 Gene Methylation

Churchill Ihentuge, PhD, MD, MSC, MBA

Finasteride is a medication for the treatment of androgenic alopecia and benign prostatic hyperplasia. It inhibits 5-alpha reductase, an enzyme that converts testosterone to dihydrotestosterone. Akt genes encode for AKT proteins that are crucial for cellular development, survival, metabolism, and differentiation while Cyclin D1 (CCND1) is essential for cell cycle. Studies have shown that Akt and CCNDI play vital roles in sperm motility and the aberration of these genes result in altered motility. We have earlier demonstrated that finasteride modulates the expression of the Akt and cyclin D1 (CCND1) genes through methylation. To evaluate the effects of finasteride on sperm motility using rat model. To further evaluate the effects of finasteride on sperm motility using rat model, we administered different doses of finasteride to the experimental groups of young adult male rats and semen samples collected for analysis. Results showed 5.4% total morphological anomalies in the experimental groups compared to 3.4% in the control group. There was also an observation of 1.6% decreased motility in the treated groups when compared to control group. The findings therefore support our earlier findings that finasteride induces altered sperm morphology and motility through epigenetic modulation of regulatory genes.

Population, Community, and Health Equity

4.1. Go for Bold: Improving Health Outcomes One Pound at a Time

Remi Patel, MHA; Allen Twigg, LCPC; Maulik Joshi, DrPH

In an effort to improve overall community health, in 2019, Meritus Health established an ambitious Bold Goal: engage Washington County, Maryland to lose one million pounds by the year 2030. The goal stems from the acknowledgement of obesity as a significant population health challenge. Goal implementation focused on leveraging existing resources, building community partnerships, and engaging community members. The campaign launched in 2020 as "Go for Bold" and promoted three strategies: increasing physical activity, adopting a balanced diet, and improving mental well-being. As of December 2024, over 160,000 pounds have been lost, with participation from 55 partners and 7,700 individuals. This initiative has demonstrated a tangible impact on the health of the community, highlighted by improvements in BMI in Meritus patients. Among the 32,108 Meritus Health patients that received annual BMI measurements from 2020 to 2024, the percentage of them achieving a BMI under 27 increased by 1.36%. When applied to a larger cohort of 99,586 patients in 2020 and 123,384 patients in 2024, there was a 2.3% increase in patients meeting this benchmark. For the 824 patients that had an annual endocrinology visit from 2020 to 2024, there was a 5.95% increase in healthier BMIs. When applied across 1,886 patients in 2020 and 4,699 patients in 2024 having an annual endocrinology visit, the percentage of patients achieving a healthy BMI increased by 6.05%. These outcomes highlight the tremendous impact of the “Go for Bold” initiative on tackling a complex population health crisis and improving the health of Washington County.

4.2. What Matters to You, Matters to Us

Carly Critchfield, MHA; Vignesh Prasad; Maulik Joshi, DrPH

Patient-centered care is paramount for optimal outcomes. However, patients and providers often struggle to build effective connections (1). Meritus Health sought to bridge this gap by asking a simple yet profound question: "What matters most to you?" This question, integrated into patients' electronic health records (EHRs), facilitates meaningful conversations and tailors care to patient goals. This initiative underscores the power of information by enabling clinicians to gain a comprehensive understanding of their patients (2). Integrating "What Matters Most" (WMM) into existing workflows ensured that responses are accessible and visible within the EHR. The question's inclusion in EHR storyboards presents previous responses to all care team members, enhancing patient-provider connections and allowing providers to make informed, personalized care decisions (3,4). Implementation required significant teamwork and provider engagement, starting with a single physician pilot. In four years, over 60,000 responses have been recorded, creating a strategic priority for Meritus Health and driving continuous improvement. These patient responses were analyzed and categorized - the top five categories identified were Family and Relationships (noted 38% of the time), Well-being (22%), Health Concerns (15%), Lifestyle (6%), and Religion and Faith (3%). Asking "What matters most to you?" can be a powerful tool in advancing patient-centric care and building population health. By asking, knowing and acting on what matters to someone means knowing the whole person and taking care of the health of a population. Lessons learned include the importance of using a simple question, integration into the EHR and workflow, and having meaningful communication.

4.3 Bacteremia in Pediatric Patients - A Critical Review of 107 Patients in the Community Setting

Junius A. Rosario, BS, OMS-III; Anand Budi, MD; Sridhar Gona, MS, MHA, BSPharm; Nicole Kus, MD; Hugo J.R. Bonatti, MD

The spectrum of pathogens causing blood stream infections in children is expanding due to changing demographics, development of antibiotic resistance and new microbiologic test systems capable of rapid and accurate diagnosis. Blood cultures are commonly sent in children presenting with a variety of infections, but contamination must be considered when interpreting results. The microbiology database of a rural hospital in the Appalachian region of Western Maryland was queried for isolated pathogens from 1018 to 2022. 107 pediatric patients with a positive blood culture (112 specimens) were included in the study. Isolation and identification of pathogens was done using standard methods including MALDI-TOF. In total, 50.5% of patients were male and median age was 1.9 years (range 1 day to 17.8 years); 60 patients were younger 3 years. 95% of specimens grew a single pathogen; only 5 specimens were polymicrobial. In total 111 bacterial pathogens were isolated. Coagulase negative staphylococci were by far the most commonly isolated bacteria from blood cultures in this study, but contamination must be considered. For some of the unusual/rare and newer pathogens identified in this series such as Kocuria, Pseudomonas luteola, Porphyromonas asaccharolyticus, Peptoniphilus indolicus Corynebacterium coyleae amongst others still very little clinical information has been published.

4.4. A Series of Roseomonas Gilardi Bacteremias at a Rural Hospital
Manuel Linarte, BS, OMS-III; Pooja Ajith; Sridhar Gona, MS, MHA, BSPharm; Hugo J.R. Bonatti, MD; Aaron George, DO

Roseomonas gilardi (RG) is a Gram-negative, non-fermenting bacillus Characterized by forming pink colonies. RG grows relatively slowly in blood cultures and thus requires extended incubation periods. RG forms pink colonies thus the name. The organism may cause a variety of infections including bacteremia; commonly immunocompromised individuals are affected. Our institutional database was searched for all positive cultures from blood and surgical specimens (drained fluid collections and abscesses, tissue etc) during a 4-year period (10.2018 to 12.2022). All cases of RG infections were analyzed in depth. Seven isolates of RG in six patients (3m/3f) with a median age of 67.7 (range 25.7 to 80.8) years) were identified. All had positive blood cultures and all infections were monomicrobial. Blood cultures were drawn in the emergency department in five cases and on the intensive care unit in one. The median body mass index was 23.6 (range 17.5 – 44.6) kg/m2. Compared to infections caused by traditional pathogens such as Staphylococcus aureus, patients with RG sepsis were older and their BMI was lower. Frequencies of most Co-morbidities were comparable but the rate of malignancies was higher with 33% (both patients had prostate cancer) compared to approximately 10% in other groups. Sources of sepsis were urinary tract in a pregnant patient with kidney stones and a man with prostate cancer and lower respiratory tract in two patients with COPD exacerbation and on with COVID-19 pneumonia. The last patient had endocarditis of a replaced valve – this is the only patient who was not successfully treated. RG is a rare pathogen with a high propensity to invade the blood stream. It needs to be considered to cause serious infections in humans.

4.5. Correlation of the Public Perception and Reality of Pandemic Policy Formation in Washington County, Maryland
Shawn White, PhD

Even in this age where social media and rapid news communication have come to dominate the daily life of most Americans, the assumption cannot be made that the development of public policy from medical research advice is correctly perceived in the general population. A recent study by Meng Li and Helen Colby showed that less than 50% of residents in states with no mask mandate had an accurate awareness of this policy. It stands to reason there may also be deficiencies in understanding how public policies are actually created from medical research data. This research project will explore the differential of what may be widely thought of in Washington County as the mechanisms for policy creation with the actual process being used. A questionnaire will be used to generate a picture of the common themes that have formed in the mind of the general public. The demographic of the target participant group will be persons over the age of 21 and reside in Washington County. A wide cross section is desired to include those working in the medical field and those who do not. Plumbers, electricians, teachers, fast food workers, students, etc. will all be sought after to give the most accurate subsample of the population of Washington County. The results of the questionnaire will be compared to the actual policies and policy development as obtained from medical experts and public health officials. The

conclusions to be presented will consist of the percentage of people who can correctly answer questions about the current COVID-19 guidance and policy development. Percentage correct will be displayed for questions such as "Does the Washington County health department currently recommend that all community members, even those who are vaccinated, continue to take actions to protect themselves and prevent the spread of COVID–19 including wearing a well-fitted mask indoors among people who do not live with them?"

4.6. Perceptions of Opioid Use and Treatment in Rural Appalachia: A Quantitative Review of the Literature

Heather P.M. Theibert, DO; Evan Curry, MS; Ajay Bhandari, MD

The United States, disproportionately in rural Appalachia, has seen a substantial increase in deaths from overdose or other medical co-morbidities due to the increasing grip of the opioid epidemic. One proposed factor of the disproportion is lack of treatment and harm reduction services and concern of public opinion with decreased funding and acceptance of interventions. This project aims to review published survey and interview-based research collected in rural Appalachia to identify overarching trends in perception of opioid use, harm reduction initiatives,and barriers. Studies measuring perceptions of opioid use from rural Appalachia were found using Pubmed.gov. Key themes from interviews and surveys were extracted to demonstrate presence of beliefs regarding opioid use and strategies to mitigate harm. Eleven articles, 5 of which used quantitative surveys for measurement, 5 using qualitative interviews, and 1 using a quantitative interview approach, were found with 146 specific perceptions. There were 15 perceptions most commonly seen and were primarily found through quantitative surveys which, in general, were biased towards a more positive view of addiction treatment and those who use. In general, however, there was high heterogeneity in perceptions with many contradicting attitudes such as addiction being a choice (1) vs. a disease (3), the role of harm reduction in addiction, and barriers to care. Perceptions of opioid use and interventions are widespread with variations through the studies. This information can help advocate for people who use opioids by identifying ways and populations to educate about opioid use.

Medical Education Research

5.1. How to Prepare for the Comprehensive Osteopathic Medical Licensing Examination of the USA Level 2-Cognitive Evaluation (COMLEX-USA Level 2-CCE)

Samuel Kadavakollu, PhD, MSc; Aaron George, DO; Venkata Atluri, PhD, MSc; Paula Gregory, DO

To complete undergraduate medical training and secure licensure, osteopathic medical students must pass standardized high-stakes examinations, including the Comprehensive Osteopathic Medical Licensing Examination of the USA Level 2-Cognitive Evaluation (COMLEX-USA Level 2-CE). The examination aims to verify learners' necessary clinical knowledge, diagnostic reasoning, required competencies for osteopathic physicians in training, and readiness before they

advance to graduate medical education settings. As the number of students in osteopathic medical training increases, it is essential to advance opportunities for COMLEX-USA Level 2- CE preparation. We emphasized a plan to support osteopathic medical students and osteopathic medical educators, learning specialists, academic advisors, and administrators in developing effective preparation strategies for the COMLEX-USA Level 2-CE. The tips within this preparation plan align with the information presented in osteopathic medical school curricula and the content outline found within the National Board of Osteopathic Medical Examiners (NBOME) blueprint. These tips include an emphasis on preparation phases for planning, reviewing, and practicing as well as the importance of clinical curriculum, clinical examinations, NBOME Blueprint, clinical scenarios, and complete full-length examinations. This is an opinion piece that describes how osteopathic medical students can prepare, practice, and develop more effective board preparation strategies to improve their COMLEX Level 2-CE score.

5.2. A Comprehensive Review of Clinical Experiences and Extracurricular Activities Among U.S. Premedical Students Applying to Osteopathic Medical Schools

Samuel Kadavakollu, PhD; Thu Dang, BS; Jasleen Bains, BS; Jared Ham-Ying, DO; Boris Boyanovsky, MD; Mahboob Qureshi, MD; John Graneto, DO; Sherese Richards, MD

The healthcare industry faces a critical shortage of qualified physicians. To address this growing concern, medical schools nationwide are increasing their efforts to recruit and train premedical students to fill this gap. Those efforts include adequately preparing premedical students with the competencies and skills to meet the application requirements and gain acceptance to the medical school of their choosing. These requirements include a Medical College Admission Test (MCAT) score at or above the mean of 504, a grade point average (GPA) at or above the mean of 3.61 for the total GPA and 3.53 for the science GPA. The application also requires demonstrating specific core competencies, including patient care, communication, and problem-solving skills evidenced by activities and achievements. Unfortunately, many premedical students are unsure of what activities and experiences fulfill these competencies, the expectations of medical school and clinical practice, and the roles and responsibilities in various settings. Therefore, early exposure and guidance when selecting these experiences and activities are vital in helping premedical students make informed decisions and select experiences that align with their career goals. While obtaining clinical experiences can be challenging, these requirements may provide invaluable insights into the profession and fulfill competencies required for medical school admission. Furthermore, these experiences familiarize students with clinical and interprofessional settings early in their careers. Because premedical students are better equipped to gain admission to medical school, universities can expand their pool of qualified and adequately prepared candidates matriculating into medical training. This analysis aims to determine how US premedical osteopathic and allopathic students gain clinical experiences and extracurricular activities that enhance their application and increase their chances of admission into a medical school of their choice. We conducted a comprehensive search of the Education Resources Information Center (ERIC), Scopus, Excerpta Medica Database (EMBASE), and other databases for original peer-reviewed studies on undergraduate, premedical, and medical students in the United States using the deconstruction technique. Thematic analysis was employed to identify overarching themes from the results and outcomes of these studies. We have reviewed 14 studies

published between 2004 and 2022. We addressed two main themes: the types of clinical experiences and extracurricular activities that increase medical school admission and those that meet the critical competencies required for medical school and osteopathic practice. Activities such as shadowing, research, healthcare, and volunteering were identified repeatedly. Self-reporting, researcher bias, and low response rates were among the limitations. The six themes informed the tips: Shadowing, Health-related work experiences, Internships and achievements, Non-health-related work experiences, Extracurricular activities, and Community enrichment and Volunteering (SHINE-CV). Further, we discuss acquiring these opportunities, navigating challenges, maximizing the skills and competencies gained, and demonstrating them in the medical school application. This analysis provides an updated comprehensive summary of the clinical experiences and activities intended to help prepare premedical students for medical school, given the changing climate and increased competition in medical education. The study aims to fill a gap in the literature regarding best practices for premedical students in selecting and documenting these activities. Premedical students can utilize these tips to help prepare their medical school application and acquire the competencies required for medical school.

Outreach

6.1. Eradicating the Loneliness Epidemic: One Phone Call at a Time

Ethan Feldmiller, MHA; Sridhar Gona, MHA, MS, BSPharm; Maulik Joshi, DrPH; Lynnae Messner, CPhT, MBA

The mission of Meritus is to "Improve the health our of community." In 2022, considering the Community Health Needs Assessment and patient social determinants of health screenings, Meritus identified loneliness as a health factor to address. Loneliness and social isolation is a serious problem that can impose consequences to both the mental and physical health of an individual. Research has shown that loneliness can lead to an increased risk of depression, anxiety, and a multitude of other health issues. With this understanding, it is important to prioritize social connection when these feelings emerge. In CY24, 7% of the Meritus patients that completed the health screening indicated that they were lonely. Meritus Health, having recognized that loneliness is an issue within their patient population and community at large, has set a goal to comprehensively eradicate it. As part of this effort to eradicate loneliness, Meritus Health implemented the Care Caller program in which a volunteer (Care Caller) is paired up with a Meritus Health patient who has indicated that they are lonely within their social determinants of health screening. Each participant was paired up with a care caller volunteer to find a mutual time to share a 15-30-minute phone call to facilitate meaningful social interaction for the benefit of the lonely participant. Participants were surveyed from an unbiased party by telephone 4 months after beginning the program to determine if they felt less lonely. As of December 2024, the Care Caller program has 363 participants enrolled with 88 volunteers and 1 full-time and 2 part-time employees dedicated to making weekly calls to their paired participant. In total, over 300,000 minutes have been spent on the phone between callers and participants with the results showing promising results. Approximately 250 callers who had been in the program for 4+ months were surveyed on whether or not they felt less lonely. 95% of those participants indicated they felt less

lonely because of the care caller program. Meritus has learned that programs to elicit meaningful change within their community can be cost-effective. With an increasing volunteer base and the utilization of quality improvement tools such as cycles of Plan-Do-Study- Act rapid improvement, success can be further cultivated and sustained. Building an effective community resource such as the Care Caller program does not necessarily have to impose undue financial burden on the organization. The vast majority of the care caller base are volunteers who willingly spend their time to provide a needed service to the community. The total cost of paid care callers is about $90,000 a year. With 95% of participants stating that they felt less lonely, this program helps fulfil Meritus' mission "To Improve the health of the community.