

Poster #1

Category: Clinical Vignette

School: All Saints University School of Medicine-Dominica

Clerkship Director: Mohammad Hussain, MD

Presenter: Ali Nasir

Additional Authors: Mohammad Hussain, MD

### **A Rare Case of Prostate Cancer Presenting with Diffuse Osteolytic Bony Metastases**

The axial skeleton is the most common site of metastasis in advanced prostate cancer and most commonly exhibits osteoblastic lesions. In this report, we present a rare case of a patient with advanced prostate cancer presenting with diffuse osteolytic bony metastases after pathological fracture of the right humeral head. This 63-year-old man was found to have prostate specific antigen (PSA) of 4604 ng/mL. Other labs including blood urea nitrogen, creatinine, alkaline phosphatase, lactate dehydrogenase, and erythrocyte sedimentation rate were elevated while calcium and parathyroid hormone were within normal limits. Bone scan showed multifocal osteolysis and Computerized Tomography Abdomen/Pelvis (CTAP) revealed enlarged prostate and diffuse lymphadenopathy. Multiple myeloma workup was negative. Biopsy of pelvic lymph nodes was consistent with adenocarcinoma of the prostate stage IVB and Gleason score 9. Androgen-deprivation therapy (ADT) was initiated and the patient showed gradual clinical improvement with reduction of PSA to 1741 ng/mL over the course of one month. This case underscores the significance of keeping prostate cancer in mind when confronted with a patient who has pathological fractures secondary to osteolytic lesions.

Poster #2

Category: Clinical Vignette

School: American University of the Caribbean, School of Medicine

Clerkship Director: Samira Ahsan, MD, FACP

Presenter: Alexandra Arnold

Additional Authors: Ellen Howard, MS; Jeremy Heffernan, MD

### **Boerhaave Syndrome: A Case of Inadequately Treated Dysphagia, GERD, and Potential Underlying Eosinophilic Esophagitis**

Spontaneous esophageal perforation, termed Boerhaave Syndrome, is a rare (estimated incidence 1 in 6000) surgical emergency with a high morbidity and mortality. Among causes of esophageal perforations, approximately fifteen percent are spontaneous. In the majority of cases of Boerhaave Syndrome, there is a normal underlying esophagus and an effort rupture involving severe retching or emesis occurs causing a perforation. There is, however, a subset of patients with Boerhaave Syndrome who have pre-existing esophagitis. Our patient is a 51 year-old male with history significant for hypertension, asthma, GERD, and dysphagia who presented to the Emergency Department for acute onset chest pain after trying to forcefully swallow a bite of a turkey sandwich. The patient has a history of a similar incident occurring 4 years ago while eating short ribs. EGD performed at that time was significant for Grade A reflux esophagitis and subepithelial eosinophils, however, eosinophils were not quantified. He was started on Protonix 40 mg daily. Further treatment for his dysphagia was not noted. Chest pain on this encounter was described as 10/10 in severity, that radiated to his back with multiple episodes of emesis. CT scan of the neck/chest/abdomen showed distal esophageal perforation through a 1.1 cm esophageal defect with contrast extravasation into the mediastinum, diffuse pneumomediastinum with air extending into the cervical soft tissue as well as retroperitoneum. There was a benign-appearing esophageal stenosis proximal to the GE junction which appeared to be a peptic stricture. An EGD was urgently performed, and two stents stitched together were used to close the esophageal perforation. The patient's hospital stay was complicated by Klebsiella pneumonia. The stent was ultimately removed later in his admission and the patient was discharged to a Long-Term Adult Care Hospital.

Poster #3

Category: Clinical Vignette

School: American University of the Caribbean, School of Medicine

Clerkship Director: Samira Ahsan, MD, FACP

Presenter: Demitria Sawelson

Additional Authors: Jalil Shojaei, MD, Courtney M. Moore, MD

### **A Rare Case of Necrotizing Neurosarcoidosis**

Sarcoidosis is an idiopathic inflammatory condition characterized by granulomatous inflammation which can affect the central nervous system in only about 5% of patients. Of that small percentage, a rare subset exists called necrotizing neurosarcoidosis, which can present without systemic manifestations; very few cases have ever been reported. We present a 39-year-old-woman with past medical history of obesity, poorly controlled hypertension, chronic headaches, one year history of right vision loss and paresthesias. She presents to the emergency department with complaints of dizziness, an unsteady gait and frequent falls. Initial evaluation included Head Computer Tomography (CT) and head and neck CTA both of which were unremarkable. MRI of the brain revealed several extra-axial enhancing lesions within the brain, fourth ventricle, as well as involvement of numerous cranial nerves, most notably of the right optic nerve and bilaterally in the internal auditory canals. MRI of the spine revealed diffuse areas of nodular enhancement throughout cervical, thoracic, and lumbar spine. Cultures of meningeal tissue were negative for the presence of acid-fast bacilli ruling out central nervous system tuberculosis. Meningeal biopsy revealed granulomatous inflammation with focal necrosis confirming necrotizing neurosarcoidosis. Treatment for this patient is multifactorial including immunosuppressants (methotrexate, cyclosporine or cyclophosphamide). This is a very rare example of necrotizing neurosarcoidosis presenting without systemic manifestations, highlighting the importance that variants of the disease can present without typical systemic symptoms.

Poster #4

Category: Clinical Vignette

School: Central Michigan University School of Medicine

Clerkship Director: Nicholas Haddad, MD, FACP

Presenter: Archana Bharadwaj

Additional Authors: Zhi Li MD, Elizabeth Bankstahl MD FACP, Shyam Moudgil MD Ascension St. John Hospital - Grosse Pointe

### **Visions of Pink: An Unusual Case Posterior Ischemic Optic Neuropathy**

**Introduction:** Posterior Ischemic Optic Neuropathy (PION) is an acute neuropathy due to ischemia in the retrobulbar portion of the optic nerve and characterized by painless, sudden unilateral or bilateral vision loss.

**Case:** A 67-year-old African American male with a past medical history of diabetes, hypertension, and peripheral arterial disease was admitted for hyperglycemic hyperosmolar syndrome and intubated due to altered mental status.

On extubation, he had a right facial droop and right upper extremity weakness. Stroke workup including MRI, CTA, and CT perfusion revealed a small right posterior parietal acute ischemic infarct. He also reported sudden onset of painless bilateral vision loss upon waking from sedation. Eye exam by ophthalmology showed non-reactive pupils and mild right optic disk pallor.

Due to high sedimentation rate and C-reactive protein, he was initiated on steroids for Giant Cell Arteritis (GCA). Temporal artery biopsy exhibited no evidence of GCA. Given his lack of headaches, myalgia, and negative biopsy, GCA was ruled out. Pituitary apoplexy, mucormycosis, cavernous venous thrombosis, retro-orbital lesions were ruled out by MRV, MRI orbital, and nasal endoscopy.

Work-up for Neuromyelitis Optica and Leber's hereditary optic neuropathy (Brother lost his vision at young age) were pursued with results pending. After discussing with neurology, the cause of his vision loss is believed to be PION due to relative hypotension on admission, with systolic blood pressures ranging from 90-110 and later averaging 150-160, causing optic nerve hypoperfusion.

Interestingly, he reported seeing flashes of lights and images not present, indicating visual hallucinations consistent with Charles Bonnet syndrome, caused by the brain's adjustment to significant vision loss.

**Conclusion:** PION is a clinical diagnosis and made by exclusion of other etiologies. A broad spectrum of differentials should be explored in a clinical presentation of sudden bilateral visual loss such as occipital infarction, ocular ischemia, and retinal migraine.

Poster #5

Category: Research

School: Central Michigan University School of Medicine

Clerkship Director: Nicholas Haddad, MD, FACP

Presenter: Zain El-amir

Additional Authors: Asim Kichloo MD, Farah Wani MD, Hafeez Shaka MD

### **Obstructive Sleep Apnea and Acute Respiratory Failure: Inpatient Mortality and Highlights from the Nationwide Inpatient Sample**

**Introduction:** Obstructive sleep apnea (OSA) is known to impact mortality and may increase the risk for respiratory distress. There is a paucity of information on the differences in inpatient mortality and outcomes in hospitalizations for acute respiratory failure (ARF) with and without OSA.

**Methods:** This population-based retrospective observational study used data from the Nationwide Inpatient Sample for 2018. Hospitalizations of adults 18 years old and older with a principal diagnosis of ARF were obtained using ICD-10 codes. Groups were delineated by the presence or absence of a secondary diagnosis of OSA. The primary outcomes were in-hospital mortality, length of stay (LOS), and total hospital charges (THC). The secondary outcomes were sepsis, acute myocardial infarction (MI), intubation, mechanical ventilation, use of vasopressors, and cerebrovascular accident.

**Results:** Patients without OSA were found to have a higher in-hospital mortality (with vs without OSA: 4.6% vs 9.2%; adjusted odds ratio [aOR] 0.45; 95% confidence interval [CI] 0.41-0.50;  $p < 0.001$ ), greater THC (\$63,900 vs \$67,300; aOR -4,000; 95% CI -6,900- -1,200;  $p = 0.005$ ), and greater prevalences of sepsis (2.4% vs 3.7%; aOR 0.59 95% CI 0.52-0.68;  $p < 0.001$ ), acute MI (3.0% vs 4.1%; aOR 0.57; 95% CI 0.50-0.65;  $p < 0.001$ ), intubation (12.7% vs 17.5%; aOR 0.67; 95% CI 0.63-0.72;  $p < 0.001$ ), mechanical ventilation (17.4% vs 24.7%; aOR 0.63; 95% CI 0.59-0.67;  $p < 0.001$ ), use of vasopressors (1.0% vs 1.4%; aOR 0.62; 95% CI 0.50-0.77;  $p < 0.001$ ), and cerebrovascular accident (0.6% vs 1.0%; aOR 0.47; 95% CI 0.35-0.63;  $p < 0.001$ ) than those with OSA.

**Conclusion:** Patients without OSA hospitalized for ARF may be at increased risk of serious complications and death than those with OSA.

Poster #6

Category: Clinical Vignette

School: Central Michigan University School of Medicine

Clerkship Director: Nicholas Haddad, MD, FACP

Presenter: Jocelyn Garcia

Additional Authors: Utibe Effiong, M.D., MPH

### **Symptomatic Confluent and Reticulated Papillomatosis in a 33-year-old Female**

Confluent and reticulated papillomatosis (CARP) is a relatively rare skin condition with unclear pathogenesis and etiology. This skin condition affects individuals of all races worldwide. Although definitive pathogenesis and etiology have not yet been identified, it is strongly believed that CARP is a disorder of keratinization. Its low incidental reporting could be attributed to its usual lack of symptoms. A retrospective review conducted by the Mayo Clinic identified just 39 cases of affected young adults between the ages of 8 to 32 years old in the United States. Of those 39 patients, 80 percent were asymptomatic, apart from the rash, while the other 20 percent reported only mild pruritus. We report a symptomatic case of CARP in a 33-year-old female who was successfully treated with an oral course of minocycline. This case highlights the importance of interdisciplinary efforts to diagnose a rather rare disease. It is our suspicion that many cases of CARP go undiagnosed simply due to lack of awareness of this uncommon skin condition. In our case, the expertise of pathologists both in our institution and the University of Michigan helped us diagnose a condition that could have easily and erroneously been treated as tinea versicolor.

Poster #7

Category: Research

School: Central Michigan University School of Medicine

Clerkship Director: Nicholas Haddad, MD, FACP

Presenter: Cody Hall

Additional Authors: Gabriel Swenson; Joshua Richmond; Beth Bailey, PhD

## **Using Public Michigan Data to Examine the Impact of Sociodemographic Factors on COVID Testing, Infection, and Mortality Rates**

### Objective

Several studies have found associations between social determinants of health and COVID-19. This ecological study investigated all 83 counties in Michigan to identify social determinants associated with COVID-19 testing, infection rates, and death rates.

### Methods

County-level demographic data were compiled from the U.S. Census Bureau on race and socioeconomic status. The New York Times database was used to collect data on COVID-19 infection rates and death rates. Data were collected from the Michigan Department of Health and Human Services for COVID-19 testing rates. Using IBM SPSS 26, these variables were compared via two-tailed independent samples t-tests.

### Results

COVID-19 testing occurred at higher rates in urban versus rural counties, and was negatively correlated with percent of the population insured. COVID-19 infection rates were highest in counties with more non-Whites and more uninsured. COVID-19 deaths were lowest in counties with the highest rates of the population with at least a Bachelors' degree and at higher household income levels.

### Conclusion

These results highlight the impact of COVID-19 on poorer and minority communities in Michigan, and likely within the United States as a whole. Findings suggest that communities with high rates of uninsured persons are seeing less testing for COVID-19 which could indicate that this pandemic is far more widespread than currently realized. Finally, results point to ways to better utilize scarce resources and where to focus more public health initiatives in Michigan to begin to bring this pandemic under control.

Poster #8

Category: Clinical Vignette

School: Central Michigan University School of Medicine

Clerkship Director: Nicholas Haddad, MD, FACP

Presenter: Sharanya Jayachandran

Additional Authors: Frederick Michael DO, FACP

### **Helicobacter pylori Infection as a Cause of Unexplained Iron Deficiency Anemia in Patients Without Gastrointestinal Blood Loss**

There is conflicting information regarding the relationship between iron deficiency anemia (IDA) and *Helicobacter pylori* infection. 15% of IDA cases are unexplained, and it is hypothesized that some of these are related to *H. pylori* infection.

One theory for lower iron levels is malabsorption due to increased hepcidin. Hepcidin, a regulatory peptide released to degrade iron export protein ferroportin, is increased in states of chronic disease and inflammation. Higher hepcidin levels, which may arise due to *H. pylori* infection, block intestinal iron absorption, reducing iron available for erythropoiesis.

Another proposed mechanism of IDA is an *H. pylori* induced pH imbalance. *H. pylori* utilizes urease to alkalinize the acidic stomach environment, making the antrum more suitable for it to thrive. The acidic pH of stomach contents in the proximal duodenum activates enteric ferric reductase, which converts ferric to absorbable ferrous ions. Gastric acidity changes by *H. pylori* may affect duodenal iron absorption.

One 2014 study found no association between *H. pylori* and IDA, while another showed a statistically significant correlation between *H. pylori* eradication and hemoglobin level improvement in those with refractory IDA. Another study in unexplained IDA patients found *H. pylori* eradication led to anemia resolution in more than a third of the study population, contradicting a study that suggested idiopathic IDA resolved in most subjects, regardless of *H. pylori* treatment. A 2019 study demonstrated higher hepcidin levels in school-age children with *H. pylori* infection, and a 2018 study showed significantly lower iron and vitamin B12 levels in subjects infected with *H. pylori*.

The exact relationship between IDA and *H. pylori* remains controversial. We present four cases of IDA in patients with no apparent source of gastrointestinal blood loss identified through endoscopy. We propose that in patients with unexplained IDA, *H. pylori* needs to be considered as the primary etiology.

Poster #9

Category: Research

School: Central Michigan University School of Medicine

Clerkship Director: Nicholas Haddad, MD, FACP

Presenter: Jake Quarles

Additional Authors: Rachel Swanson; Jyotsna Pandey, MD, PhD

### **Student Perceptions of Experiential Learning Adaptation During the COVID-19 Pandemic**

**Background:** The Healthy Aging Initiative at Central Michigan University (CMU) partners with community organizations to provide wellness resources to geriatric populations in Michigan. Traditionally, this consists of at-home visits involving health professions students from a variety of graduate and undergraduate programs. However, with the COVID-19 pandemic, CMU provided hybrid education for the 2020 fall semester requiring the at-home visits be conducted in a “telemedicine-patterned” format. Alterations to the traditional program were required and subsequently completed by a student leadership team prior to the academic year.

**Methods:** Predicted challenges were assessed. Standardized surveys were sent to all student participants to gauge response and net promoter scores were calculated. Open-ended questions were asked to identify problems encountered by teams during training, pre-visit, visits, and post-visits. These responses were compared to those of the previous year to determine the differences of opinion after the “telemedicine-patterned” changes.

**Results:** Responses were gathered for 234 students who participated in this year's virtual experience. The average rating when asked how likely you are to recommend a similar experience to others was 5.88 on a scale from 1-10. The net promoter score showed 114 (49%) detractors, 76 (32%) passive, and 44 (19%) promoters. Responses in the previous year yielded an average of 6.43 on a scale from 1-10 when 176 students were asked how likely they were to recommend this experience. The net promoter scores were 79 (45%) detractors, 61 (35%) passive, and 36 (20%) promoters.

**Conclusion:** Adaptation of an experiential learning program to an online-format created many challenges. When student interest was assessed, the opinions and likelihood of recommending a “telemedicine-patterned” program decreased, as seen in changes to the net promoter scores. This was expected as an online-format is not as engaging and produces unique challenges, such as technical difficulties and lack of personal connection.

Poster #10

Category: Clinical Vignette

School: Central Michigan University School of Medicine

Clerkship Director: Nicholas Haddad, MD, FACP

Presenter: Nana Amma Sekyere

Additional Authors: Roma Srivastava, MD; Insija Selene, MD; Sindhura Anathaneni, MD

### **One Thing Leads to Another: Autoimmune Hemolytic Anemia as a Presenting Complication of Chronic Lymphocytic Leukemia**

An 82-year-old female presented to the emergency department with a hemoglobin of 5.2 g/dl and complaints of nausea, fatigue, and progressive generalized weakness over the past 2 months. The patient's blood pressure was elevated at 138/68 mmHg, but all other vitals were within normal limits. Her physical exam and fecal occult blood test were negative. She was given 2 units of packed red blood cells (RBC) and her post transfusion hemoglobin increased to 8.5 mg/dl. Pertinent lab findings on admission included: BUN 30 mg/dl, total bilirubin 2.6mg/dl, RBC count 1.6 M/mcl, and a lymphocyte percentage 51.8% on CBC. Further anemia workup revealed reticulocyte count 3.8%, LDH 2105 U/L, ferritin 795 ng/ml, and normal iron levels. Hemolytic anemia was suspected, and a direct Coombs test resulted positive for warm IgG agglutinins indicating autoimmune hemolytic anemia (AIHA). The patient's peripheral blood smear and morphology disclosed normocytic normochromic anemia, lymphocytosis with atypical and reactive lymphocytes, and smudge cells. Due to the findings of lymphocytosis, flow cytometry was performed, yielding B-cells expressing CD5, CD19, dim CD20 markers and dim lambda light chains. These findings were indicative of chronic lymphocytic leukemia (CLL). A diagnosis of AIHA due to CLL was made and follow-up with hematology and oncology was scheduled for the patient.

CLL is a neoplastic proliferation of mature B-cells that typically co-express CD5 and CD20 markers. Complications of CLL include dysregulation of the normal immune system resulting in autoimmune cytopenia with AIHA being the most common. AIHA is an antibody-mediated destruction of autologous red blood cells. AIHA is confirmed with a direct Coombs test positive for warm IgG antibodies on the surface of red blood cells. Chronic Lymphocytic Leukemia has an insidious course. Thus, it is important for clinicians to understand various presenting complications like AIHA to ensure patients are quickly diagnosed and treated.

Poster #11

Category: Research

School: Central Michigan University School of Medicine

Clerkship Director: Nicholas Haddad, MD, FACP

Presenter: Jaime Tan

Additional Authors: Bernard Noveloso, MD, Chin-I Cheng, PhD

### **A COVID-19 and Influenza Survey in Saginaw, Michigan: Relationships, Patterns, Variable Factors, and Decision Making**

#### Background:

One year into the Coronavirus Disease 2019 (COVID-19) pandemic, 27.6 million cases and 484,000 deaths in the United States have been recorded. It has been determined that a vaccination is the best way to control the pandemic. 50 million COVID vaccine doses have been administered so far— 1.5 million in Michigan. With the flu vaccine, only 45.3% of adults nationwide received it during 2018-19. Reasons why people decline the influenza vaccine include lacking knowledge about the vaccine, misconceptions on adverse effects, etc. This study aims to identify variables that may affect both COVID and influenza vaccination uptake.

#### Methods:

An anonymous survey was provided to patients at CMU Health-Saginaw from October 2020 to December 2020. Descriptive statistics provided include mean (continuous variables) and count (categorical variables). Logistic regressions were computed (odds ratio with 95% confidence interval).

#### Results:

492 surveys were completed. Factors like past flu vaccine administration (OR=0.021), knowing someone with COVID (OR=0.532), and being 60 and older (OR=2.903-5.433) are positive indicators for receiving the flu vaccine. Those who have not received the flu vaccine this year (OR=0.101) and those below 70 years old (OR=10.202-28.279) are less likely to receive the COVID vaccine. Those who receive COVID information from news outlets (OR=2.361) are more likely to follow the CDC guidelines. The most cited reasons to not receive the flu vaccine are that the vaccine is not important, bad previous experience, and egg allergies.

#### Conclusions:

Many variables go into the decision making with regards to vaccinations. It is important to recognize the significant role of health care workers, previous health behaviors, and the media in increasing flu and COVID vaccine rates. Educating the public with proper information regarding vaccine side effects may increase vaccination rates. It would be interesting to see if these trends are consistent outside Saginaw, MI.

Poster #12

Category: Clinical Vignette

School: Central Michigan University School of Medicine

Clerkship Director: Nicholas Haddad, MD, FACP

Presenter: Sulmaz Zahedi

Additional Authors: Munir Al-Hussaini MD, Omer Al-Sheikh MD, Paul Kuddla MD

### **A Case of Kratom Induced Acute Hepatitis**

Acute hepatitis is a broad term encompassing a myriad of liver pathologies resulting from marked elevation in liver function tests. Drug induced liver injury (DILI) is one of the most common causes of acute liver failure in the United States and the most frequent reason cited for withdrawal of approved drugs from the market.

This case presents a 30-year-old caucasian female who was admitted to the emergency department with complaints of right upper quadrant pain, and retractable nausea and vomiting with 2 episodes of hematemesis. Her past medical was significant for C-section delivery 2 weeks prior, and remote history of intravenous drug abuse. The patient's medications include methadone, as well over-the-counter herbal substance called Kratom for opioid withdrawal symptoms. Patient was found to have markedly elevated transaminitis (AST of 2,350 IUnits/L, ALT of 2,284 IUnits/L), as well as peptic ulcer disease on upper endoscopy. She was promptly treated with IV acetylcysteine, and proton pump inhibitors. Rapid drug screen, acetaminophen levels, infectious and autoimmune screen were all negative. By process of elimination, it was suspected that our patient's acute hepatotoxicity was a result of Kratom-induced liver injury. She was advised to discontinue over the counter herbal remedies and was discharged on the fifth day of admission, unfortunately she was lost to follow up.

The patient in our vignette provided an intriguing medical case, her post-partum state, history of intravenous drug abuse, and epigastric pain with hematemesis resulted in a broad differential diagnosis, necessitating extensive investigation. Despite the armamentarium afforded to us by modern medicine, the answer to her condition was obtained through an astute bedside history. Clinical vignettes of this nature lend evidence to the potentially lethal implications of herbal remedies such as Kratom, encouraging stricter FDA restrictions on the use and distribution of such herbal remedies in the United States.

Poster #13

Category: Clinical Vignette

School: Michigan State University - College of Human Medicine

Clerkship Director: Churlson Han, MD, ACP Member

Presenter: Christian Bolton

Additional Authors: Connor Kerndt DO

### **GIST-Bleeding, an Atypically Youthful Presentation of Syncope and Hematemesis**

#### Intro

Gastrointestinal stromal tumors (GIST) denote the most common mesenchymal gastrointestinal tumors, although they only carry an incidence of between 10-15/million/year. Median age of diagnosis is approximately 65-years-old with less than 6% diagnosed in individuals younger than 40.

#### Case Presentation

A 38-year-old-male without previous history presented to the ED after syncope and hematemesis. The patient was feeling unwell throughout the day and experienced an urge to defecate. While straining, he became diaphoretic, lost consciousness, and woke up surrounded by hematemesis. Initial presentation noted hemodynamic stability and stable clinical condition. Lab workup was significant for hemoglobin of 10.6, BUN of 36, and hemoccult positive stool. EGD revealed an intraluminal mass on the anterior wall of the stomach with multiple overlying ulcerative lesions, consistent with gastrointestinal stromal tumor (GIST). CT demonstrated a 7.1 x 4.8 x 5.2 cm pedunculated, intraluminal, heterogeneous, low attenuating mass. Tumor resection was then performed via partial sleeve gastrectomy achieving negative margins with pathology confirming spindle subtype of GIST, graded at pT3 with CD117, DOG1, CD34 positivity. Imatinib was initiated and the patient was discharged. CT at three months demonstrated no residual disease.

#### Discussion

The significance of this case lies in the atypical nature of presentation as GIST tumors generally are asymptomatic and are exceptionally rare prior to age forty. This case reinforces the necessity of esophagogastroduodenoscopy for a thorough evaluation of gastrointestinal bleeding events. CT scan and EGD should be performed for staging and determine amenability of surgical resection. Prompt diagnosis through extensive evaluation allows for swift surgical resection to reduce risk of complication, including life-threatening bleed. Additionally, immunohistology of the resected tumor must be reviewed in order to confirm the diagnosis, risk-stratify, and to consider treatment with imatinib, which has been demonstrated to be effective at increasing recurrence-free survival.

Poster #14

Category: Research

School: Michigan State University - College of Human Medicine

Clerkship Director: Churlson Han, MD, ACP Member

Presenter: Jennifer Byk

Additional Authors: Quynh Kieu, Andrew Bender PhD, Albert Moeller MD

### **Addressing Health Care Disparities Through Population- and Setting-Specific Design for Implementation Research**

Implementation science is an emergent sub-discipline of evidence-based medicine that focuses on different approaches for effectively introducing clinical interventions to targeted patient populations. Oftentimes interventions are unsuccessful due to failure to account for sources of diversity and cultural barriers which impede application and adherence.

Our aim is to discuss the importance of centering population and setting when designing the intervention and its implementation, which can often be overlooked. In a review of the recent literature, we compared multiple research studies that focus their methods on using qualities of population and setting to improve intervention outcomes. Through these studies, we highlight significant cultural determinants that can reveal implementation limitations and help detect opportunities for revision. However, the nature of this research prevents meta-analysis by reason of methodological heterogeneity and lack of quantitative data. Our findings summarize that revising an evidence-based intervention to reflect the cultural and demographic influences impacting a target population can maximize intervention efficacy and more effectively meet the scientific and social objectives of the implementation.

Poster #15

Category: Clinical Vignette

School: Michigan State University - College of Human Medicine

Clerkship Director: Churlson Han, MD, ACP Member

Presenter: Andre Girgis

Additional Authors: Nishraj Basnet MD

### **Acute Exertional Bilateral Anterior Compartment Syndrome of the Legs with Rhabdomyolysis**

**Introduction:** Exertional rhabdomyolysis is a syndrome of skeletal muscle breakdown and necrosis that can lead to serious complications. Although rare, these cases are at increased risk for acute compartment syndrome (ACS). We present a case of a 26-year-old male who presented with lower extremity pain after moderate exercise and was diagnosed with exertional rhabdomyolysis and subsequently developed bilateral anterior ACS of the legs.

**Case:** A 26-year-old male with no significant past medical history presented to the emergency department with pain in the lower extremities that began 24 hours after a five-mile run.

Physical exam was remarkable for bilateral lower extremity tenderness. Labs showed elevated creatine phosphokinase (CPK) 1145, Creatinine (Cr) 1.55 and aspartate transaminase (AST) 52, Alanine transaminase (ALT) 59, moderate blood and 0-2 RBCs on UA and exertional rhabdomyolysis was diagnosed. Interval physical exam showed unrelenting tenderness and repeat labs showed significant CPK rise >20,000. The patient was then evaluated for ACS and was found to have ischemic but viable muscles in the anterior compartment bilaterally. Elevated intracompartment pressures (ICP) confirmed the diagnosis and emergent fasciotomies of both extremities were performed.

**Discussion:** Early assessment and diagnosis of ACS significantly impacts outcomes. Delayed treatment with ischemia 1 to 4 hours is associated with reversible neuropraxia while over 6 hours is associated with irreversible nerve and muscle damage. In a case series of exertional ACS, 57% of patients were initially misdiagnosed and received non-urgent treatment. Diagnoses made under 24 hours had no evidence of long-term sequelae. Preferred treatment is early fasciotomy performed with appropriate ICP measurements.

**Conclusions:** Exertional ACS are rare and challenging cases that can develop insidiously. Increased awareness of presenting symptoms and risk factors along with serial examinations can address issues of delayed diagnoses. Early diagnosis and fasciotomy is essential for better prognoses with less risk of long-term complications.

Poster #16

Category: Clinical Vignette

School: Michigan State University - College of Human Medicine

Clerkship Director: Churlson Han, MD, ACP Member

Presenter: Zachary Jodoin

Additional Authors: Spencer Sims

### **Idiopathic 4-Compartment Syndrome of the Lower Leg: A Case Report**

Here we present a case of acute idiopathic four-compartment syndrome of the leg, treated by four-compartment fasciotomy, and wounds left to heal by secondary intention due to persistent edema following surgery. This case highlights the importance of maintaining a high level of clinical suspicion for idiopathic spontaneous compartment syndrome despite no evidence or history of recent trauma. It is important to recognize that compartment syndrome is complex and difficult to diagnose due to its wide range of presentations and potentially idiopathic nature. This case also illustrates the variability of compartment syndrome treatment and recovery. The standard treatment for compartment syndrome is fasciotomy with delayed primary wound closure, but in this case, the patient elected to heal by secondary intention due to her postoperative circumstances. Despite this unique approach, the patient's long term follow-up showed greatly improved muscle function and strength, high patient satisfaction, and return to normal ambulation.

Poster #17

Category: Clinical Vignette

School: Michigan State University - College of Human Medicine

Clerkship Director: Churlson Han, MD, ACP Member

Presenter: Matthew Juarez

Additional Authors: Matthew Juarez; Mohammad Umar Ahmed, MD; Issa Makki, MD; Stephen Doyle, DO, MBA

### **Aortobronchial Fistula in a Hemodynamically Stable Patient with History of Coarctation of the Aorta**

**Introduction:** Aortobronchial fistula (ABF) is a rare phenomenon often leading to death if left untreated. Risk factors for the development of an ABF include trauma, infection, inflammation, aortic aneurysms, and previous thoracic interventions. Treatment options include surgical and endovascular repair, with the former associated with a high mortality rate. The most common presenting symptom is hemoptysis.

**Case Description:** A 53-year-old man with a history of coarctation of the aorta requiring surgical repair twenty-four years prior presents with progressively worsening hemoptysis over the previous four months. Outpatient workup included nasal endoscopy that was unremarkable. He then presented to the ED where a Computed Tomography Angiography of the thorax revealed multi-focal ground glass opacifications and he was discharged with antibiotics for pneumonia. Hemoptysis persisted and he ultimately underwent an outpatient bronchoscopy showing active bleeding in left mainstem and left upper lobe bronchi concerning for an ABF. He remained hemodynamically stable and was admitted to the hospital where he underwent successful emergent thoracic endovascular aortic repair (TEVAR) with endograft placement by vascular surgery. Infectious disease was concerned for an infected graft; thus follow up bronchoscopy was performed with bronchoalveolar lavage growing gram-positive cocci. At the time of this abstract, the patient was in stable condition and the determination of his long-term antibiotic regimen was pending.

**Discussion:** ABF is a rare but important diagnosis to consider in the evaluation of hemoptysis, particularly in patients with thoracic vascular pathologies. This patient's only identifiable risk factor was his prior history of thoracic aortic surgical intervention. This condition poses complex intricacies in diagnosis, intervention, and management. Nonspecific presentation and imaging often lead to delays in care and must be assessed in the appropriate clinical context. Intervention typically consists of endovascular versus open-surgical repair. Management includes follow-up, surveillance, and antibiotic therapy ranging from several weeks to lifelong.

Poster #18

Category: Clinical Vignette

School: Michigan State University - College of Human Medicine

Clerkship Director: Churlson Han, MD, ACP Member

Presenter: Jessyca Judge

Additional Authors: Radwa Koujane, Christopher C. Garcis, MD, Rakesh Gami, MD, Ahmed Elshafie, MD

### **Migraine Obscuring Acute Antithrombotic-Associated Intracerebral Hemorrhage**

#### Background

Anticoagulant therapy, particularly warfarin is associated with increased risk of intracerebral hemorrhage (ICH). Warfarin in particular increases the risk of ICH by 2-5 fold.

#### Case presentation

A 34-year-old female with a history of migraines, hypertension, and SLE presented to the ER with worsening migraine headaches. The pain was localized on top of her head and felt similar to prior migraines. She had photophobia, nausea, and denied head injury. She takes warfarin for lupus anticoagulant following a stroke last year, and has not had her INR checked since then. She had no focal deficits on exam, and after administration of a migraine cocktail her headache was significantly improved. Two days after, she presented in acute distress with worsening headaches plus visual disturbances described as waving light flashes. On exam she was hypotensive and tachycardic, with visual changes seen on exam. Labs were significant for Hct 34.9, PPT 42.5, PT 39.3, and INR 4.3., and head CT without contrast revealed acute right cerebellar hematoma measuring 2.8 x 2.2 x 3.0cm. She was started on Prothrombin Complex Concentrate and Vitamin K and admitted to the ICU for observation. The next day her INR was 1.2 and a repeat CT showed no enlargement. The likely cause of the hemorrhage was determined to be antithrombotic associated ICH given her supratherapeutic INR and the lobar location. After discharge she was instructed to follow up outpatient for a repeat CT scan and hold her warfarin indefinitely.

#### Conclusion and discussion

Brain hemorrhages can present as acute headaches, making it important to pay close attention to accompanying signs that can indicate the need for imaging. This patient presented with typical migraine symptoms and little to indicate a hemorrhage, but her warfarin history made it important to check INR and imaging.

Poster #19

Category: Clinical Vignette

School: Michigan State University - College of Human Medicine

Clerkship Director: Churlson Han, MD, ACP Member

Presenter: Radwa Koujane

Additional Authors: Jessyca Judge, MS; Ayowale Oladeji, MD; Rakesh Gami, MD; Ahmed Elshafie, MD

### **Intravenous Drug Use Associated Right-sided Infective Endocarditis in Late Term Pregnancy**

Introduction: Infective Endocarditis (IE) during pregnancy is a rare, but a serious condition that can result in increased maternal morbidity and mortality.

Case Presentation: A 26 year old female G2P0010 IV heroin user, who has a history of hepatitis C, infective endocarditis two years prior, tricuspid regurgitation and bipolar disorder. She presented at the 37th week of gestation, without prenatal care, with left sided chest pain associated with a weeklong fever, chills, night sweats, malaise, and nausea. Exam revealed an ill-appearing anxious woman, with track marks on both forearms, and a systolic murmur at the left sternal border. Work-up showed microcytic anemia, elevated ESR and CRP, with normal WBC count. Transabdominal ultrasound revealed oligohydramnios and a live fetus in breech position. Two sets of blood cultures were obtained prior to emergent C-section. Blood cultures showed MRSA bacteremia, and transesophageal echocardiogram showed vegetation on the tricuspid valve. Vancomycin was started through a central line due to difficult peripheral access. Given her history and the need for prolonged parenteral therapy, she completed 6 weeks of IV vancomycin at a Long-Term Acute Care facility, without further complications.

Conclusion: Infective Endocarditis in pregnancy presents multiple challenges in management and necessitates the optimization of care for favorable outcomes in both the mother and child. In the case of IVDA patients, additional psychosocial components must be taken into account, and early involvement of the care management team is key for completion of therapy. The ethical dilemma of PICC placement in an IVDA for completion of treatment has to be weighed against the possibility of misuse of IV access, loss to follow up, cost of long-term admission and complications of incomplete treatment.

Poster #20

Category: Clinical Vignette

School: Michigan State University - College of Human Medicine

Clerkship Director: Churlson Han, MD, ACP Member

Presenter: Esaw Kurban

Additional Authors: Eric Lind, Meghan Saunders, Eric Chase, Anupam Kumar

### **Acute Airway Obstruction from Undiagnosed Achalasia**

Primary or idiopathic achalasia is a rare and not well understood phenomenon in which there is inflammation and degeneration of the inhibitory neurons within the esophageal wall and lower esophageal sphincter resulting in loss of peristaltic activity and an inability to relax and open the sphincter. Patients, therefore, develop progressive dysphagia that generally starts with dysphagia to solid foods and gradually progresses to include liquids. Achalasia is a slow and progressive disease with additional symptoms that generally include regurgitation of food or saliva, substernal chest pain, and heartburn. As a result of the insidious onset of the disease, the rarity of the disease itself, and symptoms that are not specific for achalasia until end stage disease, both patients and physicians tend to write off the symptoms or attribute them to another cause (most commonly GERD) and subsequently, patients are often not correctly diagnosed for many years. A study done in 1997 by Eckardt et. al. showed an average of 4.7 years from symptom onset to diagnosis (1). This results in many patients presenting with more advanced disease at the time of diagnosis. We present the case of a patient who was found unresponsive and was in acute respiratory failure on arrival to the ED requiring intubation and mechanical ventilation for a tracheal obstruction caused by a retained food bolus from undiagnosed achalasia.

Poster #21

Category: Clinical Vignette

School: Michigan State University - College of Human Medicine

Clerkship Director: Churlson Han, MD, ACP Member

Presenter: Eric Lind

Additional Authors: Esaw Kurban

**Fulminant Granulomatosis with Polyangiitis Presenting with Diffuse Alveolar Hemorrhage  
Following COVID-19**

A 40 year old man developed granulomatosis with polyangiitis (GPA) shortly after resolution of a case of COVID-19. The patient experienced mild migrating joint pain for two months prior to testing positive for COVID-19. Following resolution of his symptoms, the joint pain dramatically worsened. One month later, the patient presented to a local hospital with hemoptysis secondary to diffuse alveolar hemorrhage. The diagnosis of granulomatosis with polyangiitis was confirmed with labs, imaging, and histopathology. Sudden worsening of GPA with concurrent COVID infection indicates a possible temporal relationship. Since the onset of the pandemic, SARS-CoV-2 has been anecdotally associated with the development of various connective tissue disorders. The overlapping clinical presentations and similar appearance on lung imaging presents clinicians with a diagnostic challenge. This underscores the importance of having a high index of suspicion of autoimmune diagnoses in patients who present with new or worsening findings following a COVID-19 infection.

Poster #22

Category: Clinical Vignette

School: Michigan State University - College of Human Medicine

Clerkship Director: Churlson Han, MD, ACP Member

Presenter: Kenzie Miller

Additional Authors: Trevor Sexton, Ahmed Elshafie, MD, Francesca Dwamena,

### **COVID-19 Induced Acute Pancreatitis**

#### Background

Acute pancreatitis is a common cause of hospitalization in the US, and has many etiologies, including alcohol, gallstones, autoimmune, and trauma. Here we present a case study that highlights an emerging cause of acute pancreatitis that is currently being investigated.

#### Case Presentation

The patient is a 71-year-old female with acute hypoxic respiratory failure due to COVID-19 pneumonia. She was started on Remdesivir and decadron, which improved her pulmonary symptoms, but on hospital day 7, she developed severe acute epigastric abdominal pain, with a lipase of 150 U/L, and an elevated WBC of 21.8. Abdominal CT showed fat stranding of the pancreas, suggesting acute pancreatitis, compared to a normal CT scan 3 days earlier. She denied any alcohol use and review of her current and past medications did not identify a potential cause of acute pancreatitis. Other labs from CBC, CMP, and lipid panel were normal. CT of the abdomen did not show any evidence of cholecystitis or cholangiopathy. The patient's acute pancreatitis resolved with pain control, hydration, and supportive therapy. Her WBC trended downward to baseline, and her diet was advanced as tolerated. At the time of discharge, her pancreatitis and pain had resolved, and she was tolerating oral intake.

#### Discussion and Conclusion

Acute pancreatitis has many possible causes, and the emergence of data about COVID-19 has demonstrated that the novel virus may be a cause. This complication is important to look out for and keep on a differential of a patient with COVID-19 who develops acute epigastric abdominal pain, as development of pancreatitis may be associated with an increased COVID-19-related mortality.

Poster #23

Category: Clinical Vignette

School: Michigan State University - College of Human Medicine

Clerkship Director: Churlson Han, MD, ACP Member

Presenter: Maria Padilla

Additional Authors: 1- Maria Padilla, Issa Haddad, MD, Pavel Volkov, DO, Ahmed Elshafie, MD, Richa Tikaria, MD

### **A Case of COVID-19 Reinfection**

#### Background

The clinical presentations for COVID-19 virus continue to astound health care providers as new evidence emerges. Cases of reinfection with the virus have been infrequent and the need for supportive data remains.

#### Case Presentation

We present a case of a 71-year-old male who recovered from a previous COVID infection that required hospital admission. He presented with new onset complaints of fever, chills, shortness of breath, and a dry cough. He tested positive for COVID-19 and his lab work was significant for elevated CRP and lactic acid. Imaging revealed bilateral reticular and ground glass airspace opacities with pulmonary congestion and interstitial edema. Treatment was initiated with Remdesivir and Decadron. Despite this, he continued to worsen with increased oxygen demand and persistence of symptoms. Evaluation showed the absence of COVID antibodies, and convalescent plasma was added to his treatment regimen. He gradually improved until his hypoxia was completely resolved and after 12 days of admission, he was breathing without oxygen. He was scheduled to follow up to get the COVID vaccine.

#### Conclusion

It is important to recognize the risk of COVID recurrence in previously infected individuals. That will help contain the spread and decrease the risk of transmission. The recurrence risk might increase in the future with the rise of new COVID strains.

Poster #24

Category: Clinical Vignette

School: Michigan State University - College of Human Medicine

Clerkship Director: Churlson Han, MD, ACP Member

Presenter: Marisa Reynolds

Additional Authors: RaeAnn Tourangeau-Young, Osama Mosalem, MD , Ahmed El-Shafie M.D

### **Superior Vena Cava Syndrome Due to a Third New Primary Cancer**

#### Introduction

Superior vena cava syndrome is complex and can present with multiple complications. The aim of this case report is to highlight a rapidly progressive primary lung cancer with multifactorial complications.

#### Case presentation

We report a 76-year-old male with a past medical history of tobacco abuse, supraglottic laryngeal squamous cell cancer in remission, and a prostate carcinoma in remission. He presented with shortness of breath and swelling in the neck and bilateral arms that has been progressively worsening over the last four days. He also reported arm pain, chest congestion, cough and non-bloody sputum production. Diffuse neck and bilateral upper arms swelling noted on physical exam plus dilated veins on the chest. Chest CT revealed a large mass completely encompassing the superior vena cava. Biopsy confirmed a diagnosis of superior vena cava syndrome secondary to small cell carcinoma of the lung. Imaging revealed acute deep vein thrombosis of bilateral subclavian veins plus right axillary and brachial veins. Imaging from a CXR eight months prior showed no signs of a lung malignancy. After diagnosis, treatment regimen of heparin, radiation and palliative chemotherapy comprising etoposide and carboplatin. Eleven days later, the patient was discharged home with a plan to follow up with outpatient oncology.

#### Discussion

This patient's case is unique because of the severity of his multifactorial superior vena cava syndrome, including a third primary malignancy. Patients with small cell carcinoma of the lung are prone to developing superior vena cava syndrome because of the tumor's rapid growth and preference for central airways. Prompt recognition is necessary to prevent progression to intracranial hypertension, airway obstruction, hemodynamic instability, and death. Despite the rapid onset of this patient's syndrome, treatment mainstays of chemotherapy and radiation were able to provide appropriate relief.

Poster #25

Category: Clinical Vignette

School: Michigan State University - College of Human Medicine

Clerkship Director: Churlson Han, MD, ACP Member

Presenter: Trevor Sexton

Additional Authors: Mckenzie Miller, Ahmed Elshafie

### **Reactivation CNS Toxoplasmosis in HIV Patient After Treatment Interruption**

#### Background

Untreated HIV patients are at high risk of various opportunistic infections (OIs) due to various infectious organisms. Such OIs are the main cause for morbidity and mortality in these patients.

#### Case Presentation

A 36-year-old North-African immigrant male has a past medical history of active TB, HIV, Hepatitis B and ocular infection with positive toxoplasmosis IgG, all diagnosed last year. He presented to the emergency department with a 2 week ill-defined frontal headache. Physical exam revealed no focal neurologic deficits. He was currently on maintenance TB therapy, but was not on antiretroviral therapy (ART) for 2 months. Patient had lost follow-up due to a language barrier. Workup was significant for low CD4+ T-cell count of 49, which decreased from 215 two months ago, and an HIV viral load of 4,220,000, which increased from 609 three months ago.

Brain MRI revealed a heterogeneously enhancing 4 cm mass in the left basal ganglia with surrounding vasogenic edema, two tiny adjacent enhancing nodules, and a 11.5 mm midline shift causing a mild uncal herniation. ART was held to avoid immune reconstitution syndrome. Stereotactic brain biopsy was performed and pathology showed evidence of CNS toxoplasmosis. Decadron was started after biopsy and bactrim was started for pneumocystis jiroveci prophylaxis. Treatment with sulfadiazine, pyrimethamine and leucovorin for 6 weeks was begun and completed after discharge. Repeat brain MRI 3 months after discharge revealed the mass decreased in size with no appreciation of adjacent nodules, a marked decrease in vasogenic edema and no midline shift.

#### Discussion

This patient had a previous ocular infection with positive toxoplasmosis IgG, which reactivated in disease form after HIV treatment was interrupted. HIV patients with lapses in treatment that develop neurologic complaints must be promptly evaluated and treated, as they are susceptible to developing many OIs.

School: Michigan State University - College of Human Medicine

Clerkship Director: Churlson Han, MD, ACP Member

Presenter: Michelle Zolotarevsky

Additional Authors: Connor Kerndt, DO

### **Inhaled Anticoagulation, Pill-Induced-Pneumonitis Precipitating Gross Hemoptysis**

Introduction: Pill pneumonitis (PP) describes pulmonary inflammation secondary to pill ingestion, with those with dysphagia at highest risk including neurologic impairment, anatomic deformity, and oropharyngeal dysfunction. Epidemiology of this rare condition is ill-defined to date given the scarcity of diagnosis. Herein we present a case of gross hemoptysis uncovering aspiration pneumonitis secondary to anticoagulant use.

Case Presentation: A 26-year-old male with history of MVA complicated by right upper extremity DVT with continued rivaroxaban use presented with a two-day history of massive hemoptysis with concurrent cough and development of dyspnea. The patient recalled choking a few days prior when taking his anticoagulant medication. Upon presentation, he had stable vital signs, with a benign physical exam remarkable only for mild left-sided rales and clear posterior oropharynx.

Laboratory workup demonstrated no leukocytosis and no significant change in hemoglobin. CT angiogram demonstrated peribronchial/patchy consolidation with scattered ground-glass opacities with reactive mediastinal/hilar lymphadenopathy and he was admitted for evaluation of new-onset hemoptysis. Subsequent bronchoscopy discerned diffuse patchy erythematous friable mucosa most notable in the left mainstem bronchus with a foreign body, otherwise, all accompanying testing were unyielding including BAL, infectious, autoimmune, and biopsy. The patient's rivaroxaban was discontinued and hemoptysis temporally resolved after removal of white pill foreign body.

Discussion: Foreign body aspiration is the fourth leading cause of accidental deaths in the United States, with PP as a potential complication. The acute onset of cough, wheezing, and dyspnea should raise suspicion in patients without other suggestive causes. This case describes a novel cause of PP, as no previous case describes rivaroxaban as a cause of PP. Further, this case emphasizes the importance of proper anticoagulant use, as this provoked DVT secondary to hospitalization did not require indefinite anticoagulation and this unforeseen complication may have been avoided.

Poster #27

Category: Clinical Vignette

School: Michigan State University - College of Osteopathic Medicine

Clerkship Director: Richard Thiede, MD, ACP Member

Presenter: Tabtila Chowdhury

Additional Authors: Trevor Gohl gohltrev@msu.edu

### **Subacute Combined Degeneration of Spinal Cord with Nitrous Oxide Inhalant Use in Elderly Patient**

Inhalant use is well documented amongst adolescents as being the second most common illicit substance used after marijuana. Examples of inhalants are glue, gasoline, and nitrous oxide. Although there are multiple studies on young adult inhalant abuse, it is not well documented amongst the elderly population. This case report explores the effects of nitrous oxide abuse in a 72-year-old-man who presented to the ED with memory deficits, unsteady gait, and bilateral paresthesia of hands for 3 weeks. Physical exam demonstrated positive Romberg, decreased vibration and proprioception in toes, and blunted sensations in fingers. CT imaging confirmed multilevel degenerative changes with spinal stenosis most prominent in the lumbar region, which originally was assumed to incite the patient's symptoms. Labs indicated a low level of Vitamin B12 at 104 pg/mL, and upon further investigation the patient admitted to a one time use of nitrous oxide inhalant, Whip Its, three weeks prior. MRI of the cervical-thoracic spine confirmed SCD consistent with the low Vitamin B12 level and neurological symptoms. The patient was given 1000mcg B-12 injections daily for three days, to which he endorsed improvements in his paresthesias and gait imbalance. Patient discharged with directions for PCP monitoring of his B12 level and neurological improvement. This case emphasizes the importance of thorough drug history-taking in the elderly, as they are overlooked in regards to illicit drug use compared to youth. The elderly are at greater risk for severe complications to illicit drugs, due to greater comorbidities when compared to the youth.

Poster #28

Category: Clinical Vignette

School: Michigan State University - College of Osteopathic Medicine

Clerkship Director: Richard Thiede, MD, ACP Member

Presenter: Zachary Timmerman

Additional Authors: Vamshi Vadlapatla, MD

### **Agenesis of the Dorsal Pancreas as a Cause of Recurrent Pancreatitis**

#### Introduction:

Agenesis of the dorsal pancreas is a rare congenital anomaly with variable clinical manifestations. ADP is characterized as either partial or complete absence of the pancreatic body and tail. It has been difficult to classify clinically due to its relative rarity and variety of presentations. Patients with ADP can be asymptomatic, or can present with vague abdominal symptoms, diabetes mellitus, or pancreatitis. This case discusses one of the more atypical complications of ADP, recurrent episodes of acute pancreatitis.

#### Presentation:

A 44-year-old Caucasian male with no pertinent past medical history presented to the emergency department with severe epigastric abdominal pain, nausea and vomiting. Abdominal CT showed acute pancreatitis, along with several anomalies, including agenesis of the dorsal pancreas, polysplenia, intestinal malrotation, and azygous continuation of the IVC. The patient recovered over 9 days and was discharged. One week later the patient returned with the same abdominal pain, nausea and vomiting, with additional abdominal distension. Subsequent imaging showed worsening of acute pancreatitis with a peripancreatic inflammatory mass compressing the gastric outlet. The patient required extended bowel rest and TPN. After 12 additional days the patient's symptoms had resolved and was discharged on oral PPIs and pancreatic enzyme supplements.

#### Discussion:

Dorsal agenesis of the pancreas was thought to be exceedingly rare, and although it is still very uncommon, its incidence has increased due to advances in imaging techniques. Therefore, the physician should be aware that ADP can be a cause of pancreatitis alone, and that ADP can also lead to recurrent episodes of pancreatitis. If a patient with ADP is ever diagnosed with pancreatitis, the clinician should have a high index of suspicion that this patient may have another episode. Furthermore, these patients should be monitored closely for recurrence, as it could lead to longer hospital stays and more frequent hospitalizations.

Poster #29

Category: Clinical Vignette

School: Oakland University William Beaumont School of Medicine

Clerkship Director: Lynda Misra, DO, MEd, FACP

Presenter: Alexander M. Balinski

Additional Authors: Rachel N. Harvey; Melanie M. Smalley, DO; Maham T. Siddiqi, MD

### **Vaping-Related Clotting and Embolic Phenomena Presenting as Central Retinal Vein Occlusion and Hypertensive Retinopathy**

Background: Central retinal vein occlusion (CRVO) typically manifests as unilateral vision loss from thrombosis and occlusion of the central retinal vein in patients with thrombophilic risk factors. Here, we report an unusual case of CRVO and hypertensive retinopathy likely secondary to vaping-related clotting and embolic phenomena in a young adult male.

Case Presentation: A 23-year-old male presented with three weeks of intermittent left-sided eye pressure and vision loss. Past medical history included sports-induced asthma and self-reported Raynaud's phenomenon. He denied any personal or family history of clotting disorders and tobacco use, but noted a four-year history of vaping. On exam, he was hypertensive and anxious with mildly delayed capillary refill in his bilateral feet and was found to have a left CRVO and hypertensive retinopathy. His labs showed a leukocyte count of 11.9 bil/L, but were otherwise unremarkable. COVID-19, cryoglobulin, immunoglobulin, hepatitis panel, HIV, HSV, RPR, and autoimmune labs were negative. Electrocardiogram showed incomplete right bundle branch block and transthoracic echocardiogram demonstrated mildly increased right heart pressures. Brain magnetic resonance angiography showed possible hypercoagulable changes in the right middle cerebral artery. He was started on anticoagulation and discharged. Outpatient genetic testing for Factor V Leiden, protein C, protein S, and prothrombin G20210 were normal.

Discussion: Presentations of CRVO typically arise in individuals with comorbidities such as hypertension, diabetes, and tobacco use. In patients without acquired risk factors, genetic causes of thrombophilia such as Factor V Leiden or hyperprothrombinemia should be suspected. Vaping-related hypercoagulability may also be considered as electronic cigarettes promote platelet hyperactivity and increase thrombogenic risk. Recent cases of CRVO have also been associated with COVID-19 and negative testing does not exclude this diagnosis.

Conclusion: This case highlights the importance of a thorough history when considering etiologies of hypercoagulability in otherwise healthy patients presenting with CRVO and hypertensive retinopathy.

Poster #30

Category: Clinical Vignette

School: Oakland University William Beaumont School of Medicine

Clerkship Director: Lynda Misra, DO, MEd, FACP

Presenter: Kenneth Barker

Additional Authors: Jeremy Santamaria, Ramona Berghea, MD

### **A Case Report of Subacute Endocarditis in a Previously Healthy Man with Undiagnosed Bicuspid Aortic Valve**

Infective endocarditis (IE) is caused by microorganisms entering the bloodstream and infecting the endocardium or an intracardiac device. History and physical examination usually provide important information regarding the source of infection. However, in the setting of a pre-existing cardiac structural abnormality, IE often occurs without an identifiable source of infection, and simply arises from transient bacteremia encountered in typical daily activities such as brushing teeth. Early suspicion of IE and timely medical intervention is critical for favorable prognosis, as IE can quickly lead to many life-threatening morbidities. We discuss the case of a 37-year-old male who presented with several months of self-reported fevers, night sweats, fatigue, and unintentional weight loss with food aversion beginning in September of 2020. In mid-October, he was evaluated in the ED with workup only significant for slight anemia, for which outpatient follow up was recommended. One month later, the diagnosis remained unknown after a battery of tests ruled out HIV, hepatitis C and B, hypothyroidism, and eosinophilic esophagitis. An outpatient echocardiogram was then performed and showed bicuspid aortic valve (BAV) with 1.25 cm mobile aortic valve vegetation and aortic root abscess, causing severe aortic regurgitation. Three blood cultures drawn were all positive for *Streptococcus Sanguinis*. Cardiovascular surgeon then performed aortic valve replacement and aortic root abscess drainage. One month later, the patient was recovering well with intentions to soon start cardiac rehab.

Congenital BAV affects approximately 1-2% of the general population, and these patients have a higher incidence of IE. With BAV being considered an intermediate-risk cardiac condition for which antibiotic prophylaxis for IE was restricted, this case serves to emphasize the importance of early consideration for echocardiography in an otherwise healthy young patient with unexplained chronic fevers, night sweats, and anemia because early medical management of IE is critical in preventing morbidities and mortality.

Poster #31

Category: Research

School: Oakland University William Beaumont School of Medicine

Clerkship Director: Lynda Misra, DO, MEd, FACP

Presenter: Antonio Dekhou

Additional Authors: Nader Berry, Adam Folbe

### **A Review of Burns and Explosions from E-Cigarette Injuries to the Head, Neck, and Face**

**Objective:** This review characterizes e-cigarette-associated burn and blast injuries to the head, neck, and face.

**Methods:** PubMed and Embase were searched in October 2019 using the following search terms: "e-cigarette burns," "e-cigarette injury," and "e-cigarette explosions," which yielded 400 studies. After excluding basic science research, animal studies, non-English studies, and reports of non-otolaryngologic injuries, 20 studies met inclusion criteria. Patient demographics, mechanism of trauma, injury type, treatment, and sequelae were recorded.

**Results:** 14 case reports and 6 case series were included, with a total of 21 patients. For cases that reported sex, 100% were male (20) with a mean age of 29.5 years. 75% of patients were using the device when it exploded, 15% had the device explode while activating it, 5% had the device explode in their pants pocket, and 5% fell while the device was in their mouth. Most common lacerations and/or burns involved the lips (10/21), tongue (8/21), soft palate and/or hard palate (4/21), and nose (5/21). 13 patients underwent surgeries including oral surgery or dental implants (7/13), bone graft repair (3/13), open reduction and internal fixation for preservation of sinus outflow tracts (2/13), foreign body removal from the cervical spine (1/13), and iridectomy (1/13). Reported complications included bone loss secondary to traumatic fracture, tinnitus and hearing loss, lip paralysis secondary to persistent edema, major depressive disorder and post-traumatic stress disorder, persistent sinusitis, photophobia, and bilateral axillary and hand contractures.

**Conclusion:** Given the potential for short and long-term complications, patients should be advised regarding dangers of e-cigarette use.

Poster #32

Category: Clinical Vignette

School: Oakland University William Beaumont School of Medicine

Clerkship Director: Lynda Misra, DO, MEd, FACP

Presenter: Rafey Rehman

Additional Authors: Muhammad Osto B.S., Bryan Squires M.D., Thomas J. Quinn M.D., Peyman Kabolizadeh, M.D., Ph.D.

### **Hidradenocarcinoma of the Abdomen: A Case Report and Literature Review**

Hidradenocarcinomas are a rare malignant sweat gland tumor, accounting for less than 0.0001% of tumors reported. Based on immunohistochemical differences, Hidradenocarcinomas may also be reported using different names, such as malignant clear cell hidradenoma, malignant nodular hidradenoma, malignant clear cell acrospiroma, malignant clear cell eccrine carcinoma, or primary mucoepidermoid cutaneous carcinoma. It typically arises in the head and neck area—usually the face—and presents with non-specific clinical signs and symptoms, such as a solitary cutaneous or subcutaneous lump. We hereby report an unusual case of Hidradenocarcinoma arising in the abdomen, together with a discussion of the differential diagnosis and a brief review of the literature.

Poster #33

Category: Research

School: Oakland University William Beaumont School of Medicine

Clerkship Director: Lynda Misra, DO, MEd, FACP

Presenter: Stephanie Wong

Additional Authors: Zeynep Alpay Savasan, MD

## **Effectiveness of Prenatal Screening Tests on Predicting Cardiac Anomalies**

### **INTRODUCTION**

Congenital heart disease (CHD) is the leading cause of birth defect-associated infant death. With 1 in 111 newborns born with CHD and an elevated infant mortality rate of 30-50%, early detection is imperative. Current prenatal screening mainly focuses on detecting chromosomal anomalies. However, the accuracy of these exams on detecting fetal cardiac abnormalities is not well researched. The primary goal of this study is to compare three prenatal screening tests' potential, i.e anatomy ultrasound, nuchal translucency (NT), and cell-free DNA (cfDNA), in identifying a risk for fetal cardiac anomalies.

### **METHODS**

A retrospective chart review utilized a convenience sample of obstetric patients who were treated at Beaumont Royal Oak Hospital from January 2017 to January 2018 and had completed at least an anatomy ultrasound, NT, or cfDNA. The results of the tests were compared with the newborn's postnatal diagnosis.

### **RESULTS**

A total of 2917 patients completed at least one of the tests – 1793 (61.47%) patients had anatomy ultrasound, 478 (16.39%) had NT, and 646 (22.15%) had cfDNA. 132 (4.53%) of the newborns had cardiac anomalies, 47.73% of which had major defects that require follow-ups or surgeries while 52.27% had minor defects that do not affect quality of life. Sensitivities for ultrasound, NT, and cfDNA were 20.00%, 18.75%, and 5.56%, respectively. Specificities for ultrasound, NT, and cfDNA were 99.7%, 97.97%, and 97.41%, respectively.

### **CONCLUSION**

The study suggests that anatomy ultrasound is still the most accurate in detecting cardiac anomalies. A study limitation is the small sample population because not every patient had an ultrasound, leading to a low ultrasound sensitivity. However, the study demonstrates that NT should be encouraged among physicians because the similar sensitivities of the anatomy ultrasound and NT illustrate that NT can be as important as ultrasound, the current gold standard, when screening for cardiac defects.

Poster #34

Category: Clinical Vignette

School: Ross University School of Medicine

Clerkship Director: Geetha Krishnamoorthy, MD, FACP

Presenter: Parveen Dhillon

Additional Authors: Vanessa Ogundipe MD, Kalyana Ramamurthi MD

### **A Unique Presentation of Statin-Induced Rhabdomyolysis**

**Introduction:** Statin-induced rhabdomyolysis is a rare but potentially life-threatening condition, with a reported incidence of 3.4 per 100,000 person-years. Classical presentation includes myalgias, weakness, and myoglobinuria, but all three symptoms usually only occur in less than 10% of patients. We describe an atypical case of statin-induced rhabdomyolysis with acute renal failure but without muscle pain or weakness.

**Case Description:** A 49-year-old Caucasian male with past medical history of hypertension, type 2 diabetes mellitus and hyperlipidemia presented to the emergency department with abdominal pain, nausea, and vomiting. Three weeks prior to admission, he was started on metformin and atorvastatin 40 mg daily. The patient reported generalized weakness and tea-colored urine. On admission vital signs and physical exam were unremarkable. Labs showed acute kidney injury, with blood urea nitrogen 118 mg/dL and serum creatinine 19.78 mg/dL. Creatine kinase was 68 U/L. Urinalysis showed specific gravity 1.011, pH 6.0, protein 3+, glucose 1+, trace blood and 3-4 RBCs. Patient was started on high dose steroids, and hemodialysis was initiated for acute renal failure with oliguria. Workup for autoimmune, infectious cause, or paraproteinemia was negative. Following dialysis creatinine and urine output improved. Kidney biopsy showed acute tubular injury, with evidence of pigmented casts and without interstitial nephritis, glomerulonephritis, immune-complex, or paraprotein-related disease. Patient was discharged home on dialysis and advised to stop taking his statin.

**Discussion:** We report an unusual case of statin-induced rhabdomyolysis with pigment nephropathy, where the patient did not report myalgias or weakness, and there was no elevation in creatine kinase. In this case, only myoglobinuria was present. In the absence of classical findings, rhabdomyolysis as a cause of acute kidney injury should not be discounted, however biopsy may be required to confirm diagnosis. Prompt discontinuation of statin, along with fluid resuscitation and dialysis, is critical to reverse kidney damage.

Poster #35

Category: Clinical Vignette

School: Ross University School of Medicine

Clerkship Director: Geetha Krishnamoorthy, MD, FACP

Presenter: Sara Habte

Additional Authors: M, Ahmed. A, Abdou. J, Duong

### **Atypical Presentation of Prostate Cancer**

Prostate cancer is the third most common cause of cancer-related demise in older men. Patients usually present with urinary retention symptoms or hematuria. Here, we present a case of an atypical presentation of advanced metastatic prostate cancer.

A 64-year-old gentleman with no past medical history presented to the hospital with nausea, vomiting, diarrhea, palpitation, itchy skin, and weight loss of 2 months' duration. Labs showed BUN: 300, Creatinine: >25, Calcium: 6.4, Phosphorus: 15.7, and an anion gap of 43. ECG showed Atrial fibrillation with a rapid ventricular response. A Foley catheter was placed, yielding 600cc of urine with ensuing gross hematuria. Urgent hemodialysis for 2hrs with prior administration of mannitol was completed. Further workup for hematuria showed PSA >1500, followed by digital rectal exam finding of a palpated firm, hard, non-tender prostate. A non-contrast CT scan showed bilateral hydronephrosis, non-obstructive bilateral renal calculus, enlarged prostate, and enlarged pelvic lymph nodes. Bone scan was positive for clavicle, ribs, humerus, pubic symphysis, sacrum, and the femur osseous metastasis. Bone biopsy was completed for Microsatellite instability testing for potential immunotherapy in the future. Eventually, patient underwent therapeutic bilateral orchiectomy and was started on Denosumab by oncology with a plan to add antiandrogen therapy in a one-month period. During his hospital stay, the patient's kidney function continued to improve, and by the time of discharge, BUN and Cr were 22 and 1.2, respectively. Patient was scheduled to follow up with urology and Primary care.

This case elucidates how even those common diseases can present in an unexpected and peculiar manner—moreover, the importance of preventative medicine and annual health maintenance. While enlarged prostate can cause renal failure due to post-renal obstruction, it is uncommon for a case to present at that stage merely because of annual health maintenance.

[https://www-uptodate-com.rossuniversity.idm.oclc.org/contents/prostate-cancer-in-older-men?search=cancer%20in%20men%20vs%20women&source=search\\_result&selectedTitle=3~150&usage\\_type=default&display\\_rank=3](https://www-uptodate-com.rossuniversity.idm.oclc.org/contents/prostate-cancer-in-older-men?search=cancer%20in%20men%20vs%20women&source=search_result&selectedTitle=3~150&usage_type=default&display_rank=3)

Poster #36

Category: Clinical Vignette

School: Ross University School of Medicine

Clerkship Director: Geetha Krishnamoorthy, MD, FACP

Presenter: Ajay Kerai

Additional Authors: Amitha Kakulavaram, MD

### **A Case of Delayed Onset Enteric Oxalate Nephropathy Secondary to Bariatric Surgery**

#### Introduction

Bariatric surgery remains a very popular means of weight loss. Almost two thirds of patients with RYGB have been reported to have hyperoxaluria and 7%-13% are at risk of developing secondary oxalate nephropathy (oxalosis) which if not addressed, 75% of the cases will rapidly progress to ESRD. The mean interval from surgery to diagnosis of nephrolithiasis ranges from 1.5 to 3.6 years.

#### Case Description

A 56 year old female with history of RYGB (2012), CKD 3, diastolic CHF, HTN, chronic back pain (chronic NSAID use), anemia of chronic disease and lower extremity edema (on Lasix) presented to ER with worsening bilateral lower extremity edema. On presentation vitals stable, Hb 6.9, Cr 3.74 (baseline 1.7-2.09/2019), BUN 30, eGFR 10, UA bland except 1+ protein. 3 weeks ago creatinine was 5.15 and due to concern of Lasix overuse, it was cut back. Workup for multiple myeloma, MGUS and Lupus was negative. Kidney biopsy was performed that revealed severe acute tubular injury with associated calcium oxalate deposition within tubular lumens and arterionephrosclerosis. Upon discharge Lasix dose was cut to 20mg once daily, calcium acetate 667mg with meals was started, low oxalate dietary counselling was given and outpatient nephrology follow-up was established.

#### Discussion

Oxalate nephropathy is the most severe renal complication of bariatric surgery. The mean interval from surgery to diagnosis of nephrolithiasis ranges from 1.5 to 3.6 years but in our case the diagnosis came to light 9 years after surgery. Patients with a history of bariatric surgery who start showing signs of kidney disease need to be immediately evaluated for hyperoxaluria and oxalosis. However, such an approach is usually delayed due to other confounding causes of kidney disease such as hypertension, NSAID use and chronic diuretic use.

Poster #37

Category: Clinical Vignette

School: Ross University School of Medicine

Clerkship Director: Geetha Krishnamoorthy, MD, FACP

Presenter: John Merlo

Additional Authors: David A. Miles, MD, Dr. Cecilia C. Cosma, MD

### **How a Blood Clot Can Take You By Surprise**

#### Introduction:

Deep vein thrombosis (DVT) is a common venous thromboembolism disorder which represents the third most common cause of death from cardiovascular disease after myocardial infarction and cerebrovascular accident, respectively. DVT risk factors are dependent on a variety of etiologies but one potential risk factor that has a paucity of reported cases is an arteriovenous fistula (AVF) leading to the development of a DVT.

#### Case Presentation:

A 69-year-old male with a past surgical history of bilateral inguinal hernia repair 8 months prior presented due to left lower extremity swelling for three days. Patient denied any chest pain, shortness of breath, skin discoloration or pain in his lower extremities, prolonged period of immobility, previous DVT, history of smoking or illicit drug use and family history of clotting disorders. Physical examination showed vitals, including BMI were within normal limits, left lower extremity swelling from mid shin to foot without tenderness, 2+ edema, dopplerable pulses in the left foot and no skin discoloration. A vascular venous ultrasound of the left lower extremity showed an extensive occluding DVT extending diffusely in the left lower extremity veins and an arteriovenous fistula from the left common femoral artery to the left femoral vein. He was treated with unfractionated heparin infusion then transitioned and discharged on Eliquis with the recommendation to follow up with a hematologist outpatient.

#### Discussion:

On literature review, only one prior case report demonstrates a patient who developed an AVF after undergoing laparoscopic inguinal hernia repair which led to a AVF formation between the left iliac artery and vein. Given the lack of other provoking factors, it was determined that this patient's rare presentation with a new left femoral AVF following laparoscopic inguinal hernia repair was the cause of his extensive DVT formation.

Poster #38

Category: Clinical Vignette

School: St. George's University School of Medicine

Clerkship Director: Paul Fozo, MD, FACP

Presenter: Anita Kamath

Additional Authors: Saif Affas MD

### **Appearing Through the Smoke: A Rare Case Presentation of Moyamoya Disease**

Moyamoya disease (MMD) is rare steno-occlusive disease affecting the arteries of the Circle of Willis, leading to development of characteristic collateral vessels. The appearance of these small collateral vessels on angiography was originally characterized in Japan as a "puff of smoke," which roughly translates to Moyamoya. In the United States, the reported incidence of Moyamoya is 0.086 per 100,000. Moreover, MMD is seen in African Americans at an even lower rate. MMD has a bimodal distribution with peaks around 10 and 40 years of age with a male to female ratio of approximately 2:1. As a result of its rare occurrence, Moyamoya remains an underrecognized cause of ischemic and hemorrhagic stroke in Western countries. A 57-year-old African-American female presented to our hospital with new onset left arm weakness, left facial droop, and tongue deviation to the left. Medical history was significant for hypertension and congestive heart failure. Code stroke was initiated, and head CT was concerning for right middle cerebral artery (MCA) infarct. Angiography revealed extensive atherosclerotic narrowing involving both carotid bifurcations with occlusion of the right MCA. Furthermore, collateral reconstitution of the opercular branches of the right angiographic sylvian triangle were present. The patient underwent catheterization of the bilateral internal carotid arteries and was discharged on oral antiplatelet and anticoagulation.

The constellation of angiographic findings with the subsequent development of collateral vessels is pathognomonic for MMD. Despite ongoing research, optimal management remains under debate. Medical management aims to maintain cerebral perfusion. Antiplatelet and Aspirin are recommended over no treatment by the American College of Chest Physicians. Surgical revascularization has illuminated the propensity of collateral vessels to regress and slow symptom progression. This case highlights the importance of considering MMD as a differential when initiating the stroke pathway while also highlighting a rare presentation among the African-American population.

Poster #39

Category: Clinical Vignette

School: University of Central Florida College of Medicine

Clerkship Director: Magdalena Pasarica, MD

Presenter: Andy Wang

Additional Authors: Marriyam Moten, MBBS, Loma Linda University, Loma Linda, CA

### **A Comparison of Transcatheter and Surgical Aortic Valve Replacement for Severe Aortic Stenosis Treatment**

A staggering 300,000 individuals in the U.S. are diagnosed annually with severe aortic stenosis (AS), requiring treatment with transcatheter aortic valve replacement (TAVR) or surgical aortic valve replacement (SAVR). The advantages and disadvantages of each option are many and require careful consideration of patient preferences and indications.

We present a 65-year-old male with a history of hypertension and cirrhosis who experienced worsening chest pain for some time. On examination, he had a 5/6 systolic murmur at the right 2nd intercostal space and delayed carotid upstroke, prompting a transthoracic echocardiogram. Echocardiogram showed reduced aortic valvular area (0.75 cm<sup>2</sup>), elevated mean transaortic pressure gradient (50 mmHg), and peak aortic jet velocity (4.5 m/s). He was diagnosed with severe AS and evaluated for valve replacement. TAVR was offered due to less invasiveness and concerns with SAVR given his comorbidities and age. He underwent transfemoral TAVR, and his symptoms subsequently resolved.

Severe AS is defined as an aortic valvular area <1.0 cm<sup>2</sup>, mean transaortic pressure gradient >40 mmHg, and aortic jet velocity >4.0 m/s. Treatment includes SAVR or TAVR. SAVR involves surgically replacing a diseased aortic valve with a prosthetic valve. TAVR involves inserting a catheter-based prosthetic valve typically via the femoral artery and implanting inside the diseased aortic valve. Treatment choice depends on patient preference and indications. High surgical risk patients are offered TAVR, or SAVR if infeasible. Low to intermediate surgical risk patients can undergo TAVR if high-risk anatomic features including bicuspid aortic valve are absent, or SAVR if present. TAVR is favored in older patients with less invasive preferences or adverse comorbidities like cirrhosis, and shows promising outcomes with lower mortality than SAVR. After detailed discussion of both treatments, the choice is left up to the patient unless there are compelling indications for one over the other.

Poster #40

Category: Clinical Vignette

School: University of Michigan Medical School

Clerkship Director: Cyril Grum, MD, FACP – U of M

Presenter: Janene Berli

Additional Authors: Bhanu Swamy MD, Tanya Boldenow MD, FACP, FSHM, FAAP, CHCQM, St. Joseph Mercy Hospital, Ann Arbor, MI

### **A Case of Infective Endocarditis Presenting as Meningitis Complicated by Ruptured Mycotic Aneurysm**

**Case Description:** This is a 25 year-old female with history of intravenous drug use with one year sobriety who presented with headache, neck pain, and photophobia. Laboratory results showed hemoglobin of 6.4, white count of 14.2, and a lumbar puncture revealed neutrophilic pleocytosis and elevated protein. A non-contrast CT head was negative. Patient was empirically treated for bacterial meningitis. Blood cultures resulted positive for MRSA bacteremia. Echocardiogram revealed 1.2 cm vegetation prolapsing aortic valve with severe aortic regurgitation. The second day of admission, patient became hypotensive with concern for disseminated intravascular coagulation. MRI of the brain demonstrated multiple septic and hemorrhagic emboli. Neurology, Cardiothoracic, and Infectious Disease followed the patient. Six days into admission, patient became lethargic, and repeat non-contrast CT head showed new hyperdense subarachnoid hemorrhage and CT angiography showed irregularity of the left middle cerebral artery trifurcation with saccular outpouching of the left sylvian fissure concerning for mycotic aneurysm. A repeat MRI showed several hemorrhagic intracerebral abscesses. Patient was transferred to a hospital with neuro-interventional surgical capabilities. Repeat imaging nine days later showed a ruptured mycotic aneurysm. Patient underwent coil embolization of her mycotic aneurysm and eventually received a modified Ross procedure for replacement of her aortic valve.

**Conclusion:** This case emphasizes the need for prompt recognition of neurological symptoms as an initial presenting sign of IE. Early utilization of a multidisciplinary team can have successful patient outcomes.

Poster #41

Category: Clinical Vignette

School: University of Michigan Medical School

Clerkship Director: Cyril Grum, MD, FACP – U of M

Presenter: Serena Bidwell

Additional Authors: Bhushan Deshpande, MD; Michael Dias, MD; Tristan Feierabend, MD

### **Pleural Effusion After Percutaneous Nephrostomy: How to Know When You're in Trouble**

A 55-year-old male with a history of invasive bladder cancer s/p cystoprostatectomy with ileal conduit and right renal aneurysm s/p embolization and upper pole atrophy was admitted with fever and acute dyspnea. Four days prior to admission, the patient had undergone right percutaneous nephrostomy (PCN) tube placement for an infected staghorn calculus, during which the patient experienced severe right-sided chest pain. Upon admission, a CT chest showed a loculated right pleural effusion and, upon further review, demonstrated the PCN tube traversing the right hemidiaphragm at the costophrenic recess prior to entering the right kidney. A chest tube was placed. Purulent fluid was drained, which had a pleural-to-serum creatinine ratio of 0.77. We concluded that the patient had an infected urinothorax as a complication of PCN tube placement. He was started on antibiotics and received three days of tPA/DNase instillation, with significant improvement in his effusion. The chest and PCN tubes were removed and a urinary drainage catheter was placed. He was discharged home with four weeks of ertapenem.

Urinothorax is an uncommon cause of pleural effusion that may be challenging to diagnose, and typically occur following obstructive uropathy, blunt abdominal trauma, or iatrogenic injury including percutaneous and ureteral procedures. Pleural fluid is typically transudative with a pleural fluid to serum creatinine ratio greater than 1.0, though this number lacks sensitivity and is based on studies with small sample size. Treatment relies on removal of urine from the pleural space and management of the underlying genitourinary pathology. This case was particularly unique as the infected urine confounded the usual biochemical analysis and resulted in formation of an empyema. While urinothorax is a rare condition, it should be included in the differential diagnosis of patients with a new pleural effusion and concurrent renal disease, especially following percutaneous or genitourinary procedures.

Poster #42

Category: Clinical Vignette

School: University of Michigan Medical School

Clerkship Director: Cyril Grum, MD, FACP – U of M

Presenter: Amy Blasini

Additional Authors: Elizabeth Scruggs, MD, Richard L. Weinberg, MD, PhD

### **Acute Cardiac Tamponade Reveals A Diagnosis of SLE**

**Introduction:** Systemic lupus erythematosus (SLE) is an autoimmune disease with the potential for life-threatening tissue and organ damage. This case draws attention to the importance of prompt identification and management in the intensive care setting.

**Case Presentation:** A 44-year-old woman with alcohol-related cirrhosis, esophageal varices, and rheumatoid arthritis presented with relapse of alcohol use disorder and diffuse abdominal pain. She developed hypotension, tachypnea and altered mental status requiring intubation and vasopressor support. She was transferred to our institution for further management of respiratory failure and shock. Initial diagnostics showed bilateral opacities on chest x-ray with bilateral pleural effusions. She was diagnosed with ARDS given her P:F ratio < 200 and no clinical evidence of a cardiac etiology of her respiratory failure. Subsequent CT imaging showed worsening bilateral pleural effusions and a new pericardial effusion. Echo demonstrated a moderate-to-large pericardial effusion without chamber collapse or imaging evidence of increased intrapericardial pressure. Three days later, she acutely developed worsening oxygenation, hypotension, and pulsus paradoxus. She was diagnosed clinically with acute cardiac tamponade. Emergent pericardiocentesis resulted in rapid improvement of her clinical status and revealed hemorrhagic pericardial fluid. Pericardial fluid analysis showed a glucose < 4 mg/dL and subsequent serum serologies established a diagnosis of SLE. She improved with corticosteroid therapy.

**Discussion:** Pericardial and pleural effusions can be manifestations of autoimmune disease. In the context of an unexplained pericardial effusion, one should consider autoimmune etiologies such as SLE. Left untreated, a SLE flare with pericardial effusion can progress to cardiac tamponade, which requires prompt intervention to treat obstructive shock. Sampling of pleural or pericardial fluid distinguishes transudative versus exudative effusions, which raises suspicion for autoimmune etiologies in the correct clinical context. Prompt recognition and treatment of SLE can result in resolution of pleural and pericardial effusions through medical management with steroids.

Poster #43

Category: Clinical Vignette

School: University of Michigan Medical School

Clerkship Director: Cyril Grum, MD, FACP – U of M

Presenter: Karen Hoi

Additional Authors: Aveline Li MD, Carmel Ashur MD, Shinichi Fukuhara MD, Marion Hofmann Bowman MD

### **An Atypical Presentation of Dyspnea Following Recent CABG and SAVR**

#### Background

Surgical aortic valve replacement (SAVR) is commonly performed for severe aortic stenosis. Guidelines support anticoagulation with Vitamin K antagonist (VKA) and aspirin for mechanical aortic valves, but are inconclusive for bioprosthetic valves. Current practice favors an approach with aspirin, and addition of VKA in the presence of risk factors.

#### Case

A 75yo male presented with dyspnea 3 months after a 5-vessel CABG and bioprosthetic SAVR with a 23mm porcine valve. He initially completed 8 weeks of anticoagulation with warfarin and then switched to ticagrelor. He was found to have a NSTEMI with high-sensitivity troponin 4600, b-natriuretic peptide 1968 and EKG with ST depressions. Left heart catheterization showed 90% stenosis of left circumflex artery, which was treated with a stent. He experienced ongoing dyspnea at rest and developed a new oxygen requirement. He was hemodynamically stable with diffuse crackles, trace edema and 3/6 systolic murmur. Chest X-ray and CT showed pulmonary congestion. Ticagrelor was discontinued without improvement in symptoms. Transesophageal echocardiogram showed a 0.8cm density consistent with aortic valve thrombus with peak velocity of 4.5m/sec and mean gradient 46mmHg. Patient was started on continuous heparin and underwent re-do SAVR with a 25mm bovine valve.

#### Discussion

Patient was anticoagulated with warfarin for 8 weeks following bioprosthetic SAVR and developed a thrombus within 3 months postoperatively, requiring re-operation. His presentation supports the inconclusive utility of anticoagulants in preventing bioprosthetic valve thrombosis, and highlights the need for future studies to better understand the risk factors for thrombosis and further elucidate guidelines for adequate anticoagulation after bioprosthetic valve placement.

Poster #44

Category: Research

School: University of Michigan Medical School

Clerkship Director: Cyril Grum, MD, FACP – U of M

Presenter: Tiffany Hu

Additional Authors: Iman Ali, BA; Jeffrey T. Kullgren, MD, MS, MPH

### **Helping Patients with Chronic Conditions Overcome the Challenges of High Deductible Health Plans**

**Background:** With a growing number of Americans enrolled in high-deductible health plans (HDHP), patients, especially those with chronic conditions, face increasing cost-sharing burden. We aim to develop a novel behavioral intervention to help patients use consumer strategies to better manage their health care spending.

**Methods:** This mixed methods study first conducted semi-structured telephone interviews of 20 adults with one or more chronic conditions who were enrolled in an HDHP. Themes from these interviews were used to inform the design of a national internet panel survey of 432 HDHP enrollees. Collectively, the interviews and survey assess experiences of HDHP enrollees and their preferences for the content, design, format, and mode of an intervention to help them engage in cost-conscious health care behaviors. These findings will be used to develop a novel behavioral intervention that will subsequently be pilot tested for acceptability, feasibility, and preliminary efficacy.

**Results:** Preliminary interview data demonstrated that HDHP enrollees with low confidence in engaging in consumer behaviors could better utilize cost-conscious strategies in health care if provided the information to do so. Several participants indicated interest in an intervention to learn more about how to engage in cost-conscious strategies, such as putting aside money for anticipated health care expenses, comparing cost and quality for services at different places, and talking to providers about health care costs. Most interview and survey participants preferred an easily accessible website intervention. Among survey participants, comparing cost and quality of care at different locations garnered the most interest.

**Conclusion:** HDHP enrollees with chronic conditions could benefit from an intervention that helps them manage their high cost-sharing. Based on the results of the interviews and national survey, we will develop and pilot test a novel behavioral intervention to promote use of cost-conscious health care behaviors.

Poster #45

Category: Clinical Vignette

School: University of Michigan Medical School

Clerkship Director: Cyril Grum, MD, FACP

Presenter: Virginia Ju

Additional Authors: Autumn Walkerly, Ahmed Shobassy

### **Atomoxetine-Induced Seizures and Psychosis Due to Concomitant Use of Bupropion**

Medication interactions are often missed and underdiagnosed. These interactions may occur at different pharmacokinetic and pharmacodynamic levels leading to reduced efficacy, adverse effects, toxicity, or severe complications. We report a case in which an interaction – occurring at Cytochrome P450 2D6 level (CYP2D6) – between bupropion and atomoxetine likely led to atomoxetine toxicity with predominant psychotic symptoms in a young college student. We comment on the indications of using these medications and the scenarios in which they are often used in combination. We discuss several variables to consider when prescribing medications that heavily rely on CYP2D6 enzyme for metabolism. Finally, we present common guidelines to avoid atomoxetine side effects and toxicity as a result of interactions at this cytochrome level.

Poster #46

Category: CQI/EBM

School: University of Michigan Medical School

Clerkship Director: Cyril Grum, MD, FACP

Presenter: Kevin Karlic

Additional Authors: Siddharth Madapoosi, Hari Conjeevaram

### **Improving Documentation of United States Preventive Services Task Force Cancer Screening Recommendations at a Safety Net Clinic**

**Introduction:** Per the Centers for Disease Control and Prevention (CDC), cancer is the second-leading cause of death among Americans. Cancer screening aims to detect cancer at an early stage, enabling early intervention and improved patient outcomes. We sought to improve documentation rates for cervical, breast, colon, and lung cancer screening at a safety net clinic. "Appropriate documentation" was defined as documentation of all patient-appropriate cancer screenings, per United States Preventative Task Force (USPSTF) recommendations, in the most recent SOAP note.

**Methods:** Demographic data and documentation rates were obtained via retrospective review of patient encounters at the University of Michigan Student Run Free Clinic (UMSRFC). All interventions herein described were implemented at the UMSRFC. Our study cohort included patients who qualified for one or more cancer screenings per USPSTF recommendations at the time of clinic visit and were seen by "medicine-teams" at UMSRFC.

**Results:** Our baseline cohort (n=19) demonstrated appropriate documentation in 21% of encounters. Our first intervention required intake volunteers to complete a cancer screening questionnaire and communicate pertinent results to clinical volunteers, who then followed up and completed appropriate documentation. Our first-intervention cohort (n=24, 11/7/20-1/9/21) demonstrated significant improvements with appropriate documentation occurring in 75% of encounters ( $p<0.05$ ). Individually, colon cancer screening documentation increased significantly from 27% of eligible patients pre-intervention to 86% post-intervention ( $p<0.05$ ). Trends toward improvement were also observed for cervical, breast, and lung cancer documentation (not significant,  $p>0.05$ ).

**Conclusion:** Implementing an intake questionnaire was effective at improving patient-appropriate cancer screening documentation rates at a safety net free clinic. A second intervention, in which visual reminders are posted for volunteers to complete the intake questionnaire and appropriate documentation, is currently underway. Future investigation is required to determine how documentation rates correlate with cancer screening referral and completion.

Poster #47

Category: Research

School: University of Michigan Medical School

Clerkship Director: Cyril Grum, MD, FACP – U of M

Presenter: Jonathon McBride

Additional Authors: Nancy Jariwala, Seth Klapman, Karandeep Singh

### **Assessing Predictors of Heart Sound Quality Among Hospitalized Patients: If You Don't Hear the Heart, Did It Even Make a Sound?**

**Introduction:** Increased availability of echocardiography has led to calls for its integration into the physical exam and use as a screening test for valvular heart disease (VHD). Yet, current guidelines recommend against echocardiography as a screening tool for VHD. Auscultation remains the primary method for detection of VHD due to its quick, inexpensive, and non-invasive nature. While prior work examined the ability of healthcare providers to properly auscultate abnormal heart sounds, there is limited work investigating how patient characteristics impact the quality of auscultation and, subsequently, physician diagnostic accuracy. Here, we assess how patient factors such as age, sex, and BMI affect the likelihood of auscultating high-quality heart sounds.

**Methods:** We collected digital auscultation recordings of 200 patients with recent echocardiography, scored each sound as high or low quality using a multi-rater approach regardless of underlying cardiac physiology. Based on the assigned quality score, we used univariate and multivariate linear regression to determine how patient factors correlated with the quality of heart sounds.

**Results:** We evaluated the quality of heart sounds recorded at the right sternal border and cardiac apex - corresponding to the aortic and mitral valve. At the aortic valve, male patients were significantly less likely to have a high-quality heart sound (OR: 0.29, CI: 0.10-0.74,  $p=0.017$ ). For the mitral valve, both female sex (OR: 0.51, CI: 0.27-0.94,  $p=0.036$ ) and BMI (OR: 1.14, CI: 1.08-1.21,  $p<0.001$ ) were associated with poor quality heart sounds. Age was not significantly associated with quality at either location.

**Conclusion:** Patient factors affect the likelihood of obtaining high-quality heart sounds during auscultation, suggesting that in some patients auscultation is less likely to provide proper screening for cardiac abnormalities. This study helps to inform the proper diagnostic approach to someone suspected of having clinically significant VHD.

Poster #48

Category: Research

School: University of Michigan Medical School

Clerkship Director: Cyril Grum, MD, FACP – U of M

Presenter: Lauren McGee

Additional Authors: Cayla Pichan BS; Claire Collins BA; Jackie Kercheval BA; Kirk J. Brower MD

### **Medical Student Mental Health: Student Burnout, Treatment Acquisition, and Barriers to Care at a Single Institution**

**Background:** Medical students demonstrate levels of burnout and depression disproportionately higher than their non-medical peers. Despite this, little is known about rates of treatment acquisition and barriers to receiving care amongst students with mental health concerns. This study further characterizes rates of burnout, use of professional services, and obstacles to treatment for medical students at one institution.

**Methods:** In June 2020, a 31-question survey was sent to 531 current and recently graduated medical students at the University of Michigan. Participation was anonymous and voluntary, and response to each question was optional. Results were collected for two weeks. Outcomes included self-reported measures of burnout, use of and satisfaction with professional mental healthcare services, barriers to care, comfort discussing mental health concerns with others, and suggestions for improvement.

**Results:** The survey gathered 307 unique responses. Nearly half (48.2%, n=148) of all students reported experiencing at least one symptom of burnout, and the majority (80.8%, n=243) reported concern for their overall emotional well-being during medical school. Two-thirds (66.1%, n=203) further indicated having a new or previously diagnosed mental health concern in medical school, with over one-third (36.9%, n=75) of these students sharing they have never sought treatment. The most commonly reported barriers to care included lack of time, fear of negative career repercussions, and cost.

**Conclusion:** This survey demonstrated extraordinary concern for emotional well-being and unexpectedly high rates of diagnosed or perceived mental health concerns amongst medical students. Our institution is not immune to burnout and depression; these issues are only exacerbated when financial concerns, stigma, time, and fear prevent students from getting the help they need. Using student-driven feedback, these results are currently promoting structural changes at our institution, and can hopefully provide a more robust mental healthcare model for other institutions in the future.

Poster #49

Category: Clinical Vignette

School: University of Toledo College of Medicine and Life Sciences

Clerkship Director: Christopher Lynn, MD

Presenter: Julia Berry

Additional Authors: Kate Girdhar, MPH; Kylie R. Rostad; Joel A. Kammeyer, MD, MPH

## **Concurrent Nivolumab-Associated Immune-Mediated Colitis and Clostridioides difficile Colitis: A Therapeutic Dilemma**

### Introduction

Nivolumab is a fully humanized IgG4 monoclonal antibody that targets and blocks programmed death ligand receptor on T cells. It is approved for use in metastatic melanoma and non-small-cell lung carcinoma and has been used for renal cell carcinoma. (1). However, as an immune modulator, there are many immune mediated adverse effects associated with nivolumab use, including the gastrointestinal effects of diarrhea and colitis (2,3). We present a case of concurrent nivolumab-associated immune-mediated colitis and Clostridioides colitis in which delayed recognition of the immune nature of the disease led to delayed corticosteroid treatment and a longer inpatient stay before resolution of diarrheal symptoms.

### Case Presentation

A 72-year-old female with metastatic renal cell carcinoma treated with nivolumab presented with a 3-week history of nausea, vomiting, and diarrhea. One week prior to admission, she received ciprofloxacin for a urinary tract infection. A Clostridioides difficile PCR returned as positive and she was subsequently started on vancomycin 125 mg PO 4 times daily. The diarrhea showed no improvement over the next 7 days. Vancomycin was discontinued on day 7 and fidaxomicin 200 mg twice daily was initiated, but her diarrhea remained unimproved on day 13.

Nivolumab is known to cause colitis; the treatment for this is corticosteroids. The patient was initiated on methylprednisolone 40 mg IV q6 hours. Improvement in the patient's diarrhea was promptly noted after the initiation of corticosteroids; the dose was tapered over 12 days, and the patient was discharged with resolution of diarrhea on hospital day 22.

### Discussion

Colitis is a rare side effect of nivolumab. Prompt recognition and treatment can reduce unnecessary hospitalization and prolonged antibiotic use. This case highlights the importance of considering immune related colitis when a patient on immune-modulating drugs presents with nausea, vomiting, diarrhea – even with a concurrent diagnosis of Clostridioides difficile.

Poster #50

Category: Clinical Vignette

School: University of Toledo College of Medicine and Life Sciences

Clerkship Director: Christopher Lynn, MD

Presenter: Fatima Khalid

Additional Authors: Olivia Sagan, Katarina Hughes MA, MS, Taehong Lim MD, Ronak Patel MD, Joel A. Kammeyer MD, MPH

### **Acute Non-rheumatic Streptococcal Myocarditis Masquerading as a COVID-19 Vaccine Side Effect**

As the COVID-19 vaccine becomes widely available, it is imperative for physicians to distinguish between possible vaccine side effects versus unrelated pathologies. The most well known symptoms following the COVID-19 vaccine are nonspecific (fatigue, headache, muscle and joint pain, tachycardia, fevers, chills) and can be associated with many underlying diseases. We present a case in which the presentation of acute non-rheumatic streptococcal myocarditis masqueraded as possible COVID-19 vaccination side effects.

A healthy 25-year-old male with no previous history of cardiovascular disease presented to the emergency department with chest pain on inspiration. Six days prior, he received the first dose of the Moderna COVID-19 vaccine. The patient also developed tonsillar exudates and lymphadenopathy with a positive Step test 2 days prior to admission and subsequently began Amoxicillin. On review of systems, the patient endorsed fever, tachycardia, fatigue, headache, and muscle and joint pain since receiving the COVID-19 vaccine.

Initial EKG revealed ST elevation in the lateral leads. Labs revealed elevated troponin, ESR, and CRP. Due to the initial diagnosis of NSTEMI, the patient underwent cardiac catheterization which revealed normal coronary anatomy. Cardiac MR demonstrated myocardial edema with decreased ejection fraction and delayed enhancement suggestive of an inflammatory or infectious myocarditis. He was subsequently diagnosed with acute non-rheumatic streptococcal myocarditis, and responded to medical treatment with colchicine and ibuprofen at the time of discharge.

Acute non-rheumatic myocarditis is a rare condition characterized by a new onset of myocarditis within days of initial strep pharyngitis symptoms. This case was complex due to the initial misdiagnosis of an NSTEMI and temporal association with the COVID-19 vaccine. Significant harm could have befallen the patient if proper history taking and diagnostic testing was not completed during admission. We highlight the importance of discerning between potential side effects of the COVID-19 vaccination versus alternative diagnoses.

Poster #51

Category: Clinical Vignette

School: Wayne State University School of Medicine

Clerkship Director: Diane Levine, MD, FACP

Presenter: Omar Afify

Additional Authors: Abdul-Rahman M. Suleiman, Dr. Hassan Mohamed, Dr. Omar Saaed

### **Complete Atrioventricular Block due to Ingestion of Visine® Eye Drops**

#### Introduction:

Visine® eye drops are a commonly used topical drug for irritation of the eye. The active component in Visine® eye drops is tetrahydrozoline, an imidazoline derivative. The main systemic effect of ingestion of tetrahydrozoline is bradycardia and hypotension due to activation of central alpha-adrenergic receptors.

#### Case Description:

Our patient is a 76-year-old suicidal male with a history of major depressive disorder who presented to the emergency department approximately 24 hours after ingesting 8 bottles of Visine® eye drops (120 mL of 0.05% tetrahydrozoline) mixed in wine. The patient was alert and oriented to person, place, and time. His heart rate was bradycardic at 54 bpm. During his initial work-up, the patient's heart rate dropped to 30 bpm which required immediate intervention with Atropine. The patient's basic metabolic panel showed hyponatremia with high anion gap metabolic acidosis. His troponins were elevated at 30 ng/L. Furthermore, his blood glucose was elevated at 394 mg/dL. Notably, the patient's electrocardiogram (ECG) demonstrated complete heart block and QT prolongation. To address these findings, the patient was given a one-liter bolus of normal saline, 5 units of regular insulin, and admitted to the medical intensive care unit (MICU) for observation. In the MICU, the patient remained stable for 24 hours and was transferred to the medicine floor. After 8 days of no acute events, he was transferred to inpatient psychiatry to address his suicide attempt and depression.

#### Learning Points:

Visine® eye drops contain a toxic compound called tetrahydrozoline that can have serious health complications if ingested. Tetrahydrozoline works by activating central alpha-2 receptors, which can lead to lethargy, hypotension, bradycardia, and respiratory depression. While many cases have been reported showcasing the classic symptoms of tetrahydrozoline ingestion, our case suggests that clinicians may also have to consider the potential for heart block in their workups.

Poster #52

Category: CQI/EBM

School: Wayne State University School of Medicine

Clerkship Director: Diane Levine, MD, FACP

Presenter: Anjali Alangaden

Additional Authors: Sawsan Edriss, Ntami Echeng, Ashleigh Peoples, Manvir Sandhu MS2, Suma Alzouhayli, Anil Aranha PhD

### **Student-Led Community Needs Assessment as a Tool for Social Justice-Based Medical Education Transformation**

**BACKGROUND:** Medical education has traditionally struggled to meaningfully incorporate the social determinants of health and social justice principles into longitudinal curriculum. Students from the Institutional Justice and Inclusion Committee (IJI) at a large, single-campus medical school initiated a community needs and assets assessment to better understand peer perceptions of justice, equity, diversity, and inclusion.

**METHODS:** IJI committee members recruited their peers to participate in confidential semi-structured focus group interviews from January to May 2020. Participants were selected based on existing student organizations as well as shared identities (e.g. being a parent). Question templates were used to facilitate focus group interviews. Qualitative data was documented, de-identified and coded into discrete categories.

**RESULTS:** In total, team members conducted thirty-two focus group interviews. Findings were separated into 'issues' and 'assets.' A recurring issue raised in interviews was participants' belief that the current medical school curriculum inadequately addresses key issues of health inequities, social justice, and racism in medicine. Students feel unprepared to address the biopsychosocial needs of a disadvantaged patient population. Participants identified institutional assets as well, including a diverse urban learning environment and strong administrative support for student advocacy and innovation.

**CONCLUSIONS:** Our peer-to-peer focus groups revealed that students strongly desire formalized training in diversity, equity, and inclusion issues. From this discourse, IJI committee members crafted both short- and long-term recommendations for curricular change that were presented to leadership. We advocated for the hiring of a qualified individual who is responsible for designing and guiding the integration of social justice advocacy throughout the preclinical and clinical years. Outcomes from this project include the initiation of microaggressions training for all students, the creation of an ad hoc curricular committee to integrate relevant principles, and increased partnership between administration, and IJI committee members to address curricular deficits with regards to patient-centered care.

Poster #53

Category: Clinical Vignette

School: Wayne State University School of Medicine

Clerkship Director: Diane Levine, MD, FACP

Presenter: Samaa Alkhouri

Additional Authors: Pragnesh Patel MD, Anupamdeep Mehar MD, Jessica Love MD, Omar Afifiy, Faris Alkhouri

### **Merkel Cell Carcinoma in the Setting of Chronic Lymphocytic Leukemia and Diffuse B-Cell Lymphoma**

Merkel cell carcinoma (MCC) is a rare aggressive neuroendocrine cutaneous malignancy. It is frequently misdiagnosed, and it requires high clinical suspicion. There is an increase in prevalence of MCC in the setting of hematological malignancies.

A 64-year-old black female patient with a history of 3 years of untreated diffuse large B-Cell lymphoma and untreated chronic lymphocytic leukemia (CLL), presented with a large facial mass on her right cheek. The mass has started as a small painless, non-draining boil/abscess. The mass was described as a 4cmx3cm firm bullae with surrounding fluctuance. Ultrasound showed a hypoechoic lesion. On incision and drainage, a small amount of serosanguineous fluid was drained. A possible dermatologic malignancy was suspected. However, the patient was lost to follow up. Three months later, the patient reported back with the lesion progressively enlarged to “golf ball-sized” painless, immobile hyperpigmented fungating mass on the right cheek with a cobbled stone appearance.

A computed tomography showed a 5x6x5cm soft tissue mass with central necrosis within the superficial soft tissues and a superficial polypoid lesion. The mass abuts the mandible and maxilla without any osseous invasion. Biopsy revealed presence highly atypical two population cells. One population had a salt and pepper chromatin and consistent of small to medial size cells with scant cytoplasm and hyperchromasia. These cells were positive for Synaptophysin, Chromogranin, CD56, CAM5, favoring MCC. The other population was peritumoral lymphoid aggregates composed of small lymphocytes with atypical morphology. The atypical lymphocytes were positive for CLL markers such as CD20, PAX5, CD5, CD43, CD45, CD23. Due to the increasing prevalence of MCC following a diagnosis of CLL, it is important for physicians to be familiar with the close association in order to detect secondary malignancies in their early stages and provide a better prognosis for their patients.

Poster #54

Category: Research

School: Wayne State University School of Medicine

Clerkship Director: Diane Levine, MD, FACP

Presenter: Amman Bhasin

Additional Authors: Amman Bhasin, BS, Arif Musa, MS, Azar Razikeen, BS, Louis Massoud, BS, Luis Afonso, MD, Randy Lieberman, MD, Ajay Vaidya, MD

### **Increasing Diversity in Cardiology: A Fellowship Director's Perspective**

**Background:** Under-represented minority (URM) physicians constitute only 10% of practicing cardiologists. Diversity in cardiology is essential to serve a growing number of minority patients. The goal of this study is to ask current cardiology fellowship program directors their views of diversity and recruitment of URMs.

**Methods:** A questionnaire assessing cardiology fellowship programs' demographics and strategies to increase diversity in cardiology was developed. A list of cardiology program directors (PDs) was abstracted from the FREIDA AMA Residency & Fellowship Database. An email with a link to the electronic survey was disseminated to all PDs. Data was collected from September to December 2020 and analyzed using standard statistical methods.

**Results:** Response rate was 28.4%(71/250). Most program director respondents were not URMs (n=55,77.5%), however 71.8%(n=51) programs had more than 2 URM faculty members and 62.0%(n=44) reported having URM faculty hold leadership positions. 69%(n=49) of PDs strongly agree that diversity is important to their residency program. Most PDs (n=42,59.2%) believe that allowing applicants the opportunity to interact with URM cardiology fellows, directly recruiting URM to apply to their fellowship program (n=43,60.6%), and involving current program fellows in informal recruitment of URMs (n=39,54.9%) may increase diversity in cardiology residencies. These opportunities were implemented by 54.9%(n=39), 49.3%(n=35), and 62.0%(n=44) of respondents. Most PDs (n=48,67.6%) agreed that conducting a holistic review of applicants played an important role in diversifying the cardiology applicant pool and 69.0%(n=49) implemented this method. However, deemphasizing USMLE scores when reviewing URM applications (n=24,33.8%) was less supported by PDs for increasing program diversity.

**Conclusion:** This study may be used by residents and medical students interested in cardiology, as well as to inform cardiology fellowship program directors of which interventions are being used in other programs, which programs are most supported by their peers, and which initiatives may yet need to be implemented.

Poster #55

Category: Research

School: Wayne State University School of Medicine

Clerkship Director: Diane Levine, MD, FACP

Presenter: Shiva Bongu

Additional Authors: Omid Yazdanpanah, Ibrahim Azar, Anthony F. Shields, Mohammed Najeeb Al Hallak, W. Michael Korn, Philip A. Philip

### **Genomic Profiling of Pancreatic Neuroendocrine Neoplasms (panNENs)**

**Background:** PanNENs are rare with a heterogeneous pathophysiology and widely differing clinical course. Despite a recent update of the grading system, prognostication and prediction of response to therapy remain challenging. Apart from the somatostatin receptor, there are currently no predictive biomarkers to guide targeted agents for panNENs. Molecular profiling offers an opportunity to develop new drugs and personalize treatments.

**Methods:** We compiled clinical and molecular data from patients diagnosed with panNENs at the Karmanos Cancer Institute between 2014 and 2020. Of the 35 patients with panNENs, 33 underwent Next Generation DNA Sequencing (NGS; Caris Life Sciences, Phoenix, AZ). Two tumor biopsies had insufficient tumor cells for informative molecular analyses.

**Results:** Of the 35 tumors analyzed, 11 were grade 1 (G1), 18 were grade 2 (G2), 2 were well-differentiated grade 3 (G3) and 4 were poorly differentiated pancreatic neuroendocrine carcinomas (panNEC). Median age at diagnosis was 61 years. 21 patients identified as White, 6 as Black and 8 as other. 21 were men. 28 patients had metastatic disease at diagnosis. The most frequently detected molecular alteration was MEN1 mutation (11 G1, 1 G2 and 1 G3). Three G2 and 2 G3 tumors harbored PTEN mutations. Three patients had p53 mutations and all were G3, 2 of them panNEC. An FGFR3 amplification was detected in a single G1 panNEN. Her2/Neu amplification was detected in a G2 tumor. Other frequent alterations were MGMT (4), TOP2A (4), ARID1A (3), TUBB3 (3) and TSC2 (3). Three tumors were PD-L1 positive. All tumors had low-intermediate Tumor Mutational Burden (TMB) and were Mismatch Repair (MMR) proficient.

**Conclusion:** Comprehensive molecular profiling of panNEN can detect alterations targetable with currently validated commercial agents. Further genomic and epigenomic profiling studies can help understand the molecular abnormalities underlying the carcinogenesis and progression of panNENs and aid in developing biology-driven targeted therapies.

Poster #56

Category: Clinical Vignette

School: Wayne State University School of Medicine

Clerkship Director: Diane Levine, MD, FACP

Presenter: May Chammaa

Additional Authors: Tabitha Moses, MS, Brianna Sohl, Diane Levine, MD, FACP

### **The Other Side: Ensuring Informed Consent for Medical Trainees in Research**

A third year medical student was rotating with an attending physician, Dr. M, as part of a required rotation. The two were in a patient's room and Dr. M was attempting to recruit the patient into their research study. During the conversation Dr. M informed the medical student that the study included healthy controls and asked if they would like to participate. The medical student felt obliged to answer in the affirmative; it was clear that the patient's decision hinged on the student's. The student also knew that Dr. M's evaluation would play a role in that rotation's final grade. The student felt obliged to agree, expecting there to be some time after they left the room to talk to the physician privately. That is not what happened. While still in the patient's room, the physician immediately thrust a consent form at the medical student, not providing them time to read it, asked if they were eligible--thereby requiring the medical student disclose their own medical history-- and drew the student's blood for the study right there in the patient's room. The medical student was not even provided their own copy of the consent form.

The unethical missteps that occurred in this clinical situation are unquestionable and important to discuss. There were also several inappropriate assumptions made such as the inherent ability for the medical student to serve as a healthy control. This case illustrates the importance of principles of voluntary, informed consent, especially for a vulnerable population such as medical students who are in an already tenuous position due to the inherent hierarchy in medical education. It is important to reflect on this incident to establish not only what went wrong, but more importantly, how we can do better.

Poster #57

Category: Clinical Vignette

School: Wayne State University School of Medicine

Clerkship Director: Diane Levine, MD, FACP

Presenter: Jennifer Cui

Additional Authors: Saba Abdulsada MD, Falgun Patel MD

### **Case Report: Ataxia as a Presentation of COVID-19**

Coronavirus disease 2019 (COVID-19) was first discovered in Dec 2019 and has since affected the entire world. Main symptoms include fever, fatigue, cough, and impairment of taste and smell. While neurological symptoms exist, the current literature lacks information regarding gait ataxia. We present a patient with COVID-19 and gait ataxia.

The patient is an 86-year-old man who presented to the ER in July 2020 with progressive dyspnea on exertion and imbalance for 2 weeks, along with melena. The patient denied any fevers, cough, falls, dizziness, dementia, or urinary incontinence. On admission, the patient had a normal temperature and oxygen saturation. Neurological examination demonstrated a wobbly, magnetic gait with short steps, and a positive Romberg test and tandem walk. Blood tests showed iron deficiency anemia with a hemoglobin of 9.8 g/dL, MCV 80.3 fL, WBC 3.5 x10<sup>3</sup>/uL, normal vitamin B12 307 pg/mL, normal vitamin B1 46 ug/L, and an increased CRP 24.3 mg/L. Chest xray was non-significant. A carotid duplex showed mild stenosis bilaterally. MRI demonstrated only cortical atrophy. He was given one dose of B12 without improvement. Neurology was consulted and found peripheral neuropathy. Gastroenterology recommended EGD and colonoscopy, so he underwent a COVID-19 test which came back positive. On further questioning, the patient did admit to living with family members who were exposed to COVID-19. Because he was stable, he was discharged, and the procedures were rescheduled. On subsequent exam one month later, his ataxia improved and his gait was back to baseline. Gait ataxia has a multitude of etiologies. We present a patient with gait ataxia in the context of COVID-19. This singular association has not been previously reported. Further data from case series or cohort studies need to be obtained in order to establish a true causal relationship.

Poster #58

Category: Clinical Vignette

School: Wayne State University School of Medicine

Clerkship Director: Diane Levine, MD, FACP

Presenter: Manar Edriss

Additional Authors: Dr. E. Nikki Pritchett, MD, MPH

### **Tinea Corporis: A Case of Resistance of Trichophyton Mentagrophytes to Terbinafine**

Tinea corporis is a remarkably common infection worldwide. First line treatment for this condition includes terbinafine. Recent literature indicates increased resistance of Trichophyton Rubrum, a frequently known cause of tinea infections, to this antifungal. To our knowledge, no studies have been published in the US about resistance to other species of Trichophyton. We present a case of a healthy, 50-year-old man with terbinafine-resistant tinea corporis infection caused by Trichophyton mentagrophytes. The patient presented initially with annular and scaling plaques diffusely on the upper and lower extremities, and a clinical diagnosis of tinea corporis was made. A regimen consisting of oral terbinafine 250 mg per day and topical butenafine twice a day were prescribed. The patient returned 2 months later with worsening skin lesions. A biopsy of a lesion on his right arm was then obtained, which was consistent with tinea corporis, and cultures revealed Tinea mentagrophytes. The patient denied a history of medical conditions or taking medications other than over-the-counter vitamins. Second line treatment with itraconazole 200 mg per day in addition to topical ciclopirox twice a day were started and terbinafine and butenafine were discontinued. The patient was contacted 3 weeks following the initiation of this regimen, and he reported complete resolution of his symptoms. This case demonstrates evidence of underlying resistance of Trichophyton mentagrophytes to terbinafine. With the increasing prevalence of dermatophyte resistance to antifungal treatments among different species of Trichophyton, it is important to raise awareness about this alarming trend. Additionally, there are potential long-term consequences of untreated tinea infections, such as post-inflammatory hyperpigmentation, particularly in patients with darker Fitzpatrick skin types.

Poster #59

Category: Research

School: Wayne State University School of Medicine

Clerkship Director: Diane Levine, MD, FACP

Presenter: Sawsan Edriss

Additional Authors: Hallie A. Wurst, BS, Robert Wright, MD, Manar Edriss, BS, Anil N. F. Aranha, PhD

### **Clinical Indicators of Gastrointestinal Stromal Tumors Detection in a Population Undergoing Hiatal Hernia Repair**

#### Background and Purpose:

Gastrointestinal stromal tumors (GIST) are the most common nonepithelial neoplasms involving the gastrointestinal tract. GIST incidence ranges between 0.7-1.5 cases/100,000 population per year. The purpose of the study was to identify if there are clinical indicators of detecting GIST in a population undergoing repair for hiatal hernia.

#### Methods:

A specialty surgical clinic was used to conduct a retrospective study of 183 hiatal hernia repairs. In addition to the surgical detection and identification of GIST, other data obtained included: age, gender, race, body mass index, tobacco use, pre-operative diagnosis, surgical type (laparoscopic versus robotic), presence and history of hypertension, diabetes, cancer, anemia, and chest pain. Data will be coded and analyzed using IBM-SPSS and included Pearson correlation ( $r$ ), student t-test, and chi-square test. Statistical significance was assigned at  $p < 0.05$ .

#### Results:

Among the 183 surgical cases, the majority were female (70.5%) and Caucasian (94.0%) with 3.8% of patients diagnosed with GIST. The mean age of patients with GIST ( $p = 0.006$ ) was  $70 \pm 7.4$  years and those without GIST was  $55.1 \pm 14.3$ . The patient population had a BMI of 28.9 Kg/m<sup>2</sup>, with only 8.2% being current tobacco users. A laparoscopic technique was the principal approach of repair for 92.9% of the cases. Patients with GIST were identified to have a higher prevalence of hypertension ( $p < 0.001$ ), anemia ( $p = 0.092$ ), and chest pain ( $p = 0.12$ ). None of the GIST patients had a history of diabetes or prior cancer.

#### Conclusion:

Our results suggest a strong relationship between a patient's diagnosis of GIST and older age. Given this finding, caution should be exercised in the surgical care of the older population, especially while performing hiatal hernia repair in order to avoid overlooking detection of this neoplasm.

Poster #60

Category: Clinical Vignette

School: Wayne State University School of Medicine

Clerkship Director: Diane Levine, MD, FACP

Presenter: Ricardo Engel

Additional Authors: Sunjay Modi, Eric Denha, Ali Rahim, Oghenekpaobor Oyibo, Megan Scott

### **Diffuse Alveolar Hemorrhage in a Patient Positive for P-ANCA and COVID-19**

Introduction: Diffuse alveolar hemorrhage (DAH) is a serious sequela of ANCA-associated vasculitides. It has also been described in the context of COVID-19 diagnoses, both as an imitator and as a possible complication of the disease.

Case presentation: An 88-year-old female with a past medical history significant for hypertension, hyperlipidemia, and baseline dementia presented to the emergency department with increasing weakness, shortness of breath, and confusion. Initial SARS-Cov-2 PCR was negative, and she was admitted for acute respiratory failure and anemia. Due to symptomology, an otherwise negative infectious workup, and a CT showing ground glass opacities, presumed diagnosis was COVID-19. After an episode of hemoptysis on day 2, the patient was worked up for vasculitis. Labs were positive for RF, ANA 1:160, and p-ANCA 1:31, along with elevated CRP and ESR, and normal complement. Bronchoalveolar lavage showed diffuse alveolar hemorrhage. Family refused plasmapheresis, rituximab, and kidney biopsy, and the patient was treated empirically with methylprednisolone. On day 12 of admission, the patient became acutely hypoxic, and repeat SARS-CoV-2 PCR was positive. The patient later developed a bacterial pneumonia and decompensated before passing on day 25.

Discussion: Our patient's presentation may be most accurately described as diffuse alveolar hemorrhage in p-ANCA-positive pauci-immune pulmonary capillaritis. It may have been triggered by or complicated by COVID-19. Nevertheless, diffuse alveolar hemorrhage has symptomatic and radiologic overlap with COVID-19, making diagnosis challenging. There are few reports of ANCA-associated vasculitides in the context of COVID-19. Our case demonstrates an instance of ANCA-associated vasculitis isolated to the lungs with associated SARS-CoV-2 positivity. This case illustrates the importance of clinical suspicion and consideration of rheumatologic and infectious management of diffuse alveolar hemorrhage in the COVID-19 pandemic.

Poster #61

Category: Clinical Vignette

School: Wayne State University School of Medicine

Clerkship Director: Diane Levine, MD, FACP

Presenter: Alexis Faber

Additional Authors: Yousef Bader, MD., Mohamed Ahmed El-Ghoroury, MD.

### **The Power of the Medical History**

64-year-old male presented to the emergency department for altered mental status. The patient was unable to answer questions or provide history. The electronic medical record did not provide any medical history or emergency contacts. He was found to be hypotensive and septic; he was admitted and nephrology was consulted for acute kidney injury. On the second day of admission, the patient's brother called the hospital and informed the internal medicine team that the patient is a veteran and regularly follows with the local Veterans Affairs (VA) hospital. On the third day of admission, he began to have persistent hypotension despite aggressive intravenous fluid therapy. The patient was then transferred to the medical intensive care unit where he was intubated and started on four pressor medications. At this point, the medical student with the nephrology service reached out to the local VA hospital and learned the patient had a known history of panhypopituitarism, secondary to surgical removal of a macroadenoma in 2004. Per the VA hospital records, the patient takes daily hydrocortisone, DDAVP, levothyroxine, and testosterone. The nephrology service suspected acute adrenal insufficiency; hydrocortisone was ordered and an immediate draw of the serum cortisol level revealed it to be low.

Acute adrenal insufficiency is a life-threatening medical emergency that requires prompt recognition and treatment. This is seen most commonly in patients with primary adrenal insufficiency, but may also be seen in patients with secondary or tertiary adrenal insufficiency upon acute withdrawal from chronic exogenous glucocorticoids, as was the case with this patient. Adrenal crisis presents with severe hypotension unresponsive to intravenous fluids; intravenous glucocorticoids are a necessary part of treatment. A key aspect of this case was the importance of a full medical history, including both family input and outside records. Additionally, this case demonstrates the potential benefit of a national electronic medical record.

Poster #62

Category: Clinical Vignette

School: Wayne State University School of Medicine

Clerkship Director: Diane Levine, MD, FACP

Presenter: Megan Fee

Additional Authors: Mallory Brosious, Vinay Shah

### **A Rare Case of Pulmonary Cement Embolism Following Spinal Fusion and Decompression Surgery**

Introduction: Pulmonary cement emboli (PCE) are recognized complications of vertebral cement augmentation procedures including vertebroplasty or kyphoplasty procedures, but few cases have been reported in the literature of PCE following spinal fusion and decompression surgery. Although PCE are frequently asymptomatic, life-threatening outcomes can occur, so early recognition and monitoring is imperative.

Case: 45 year-old male with history of Human Immunodeficiency Virus (HIV) (on antiretroviral therapy), chronic hepatitis B, and recently identified liver lesions presented with months of worsening low back pain, inability to walk due to lower extremity weakness, and new urinary incontinence. Dexamethasone was started due to concern for spinal cord compression. MRI of the spine revealed an epidural soft tissue mass within the spinal canal extending from T8-L1 causing cord compression. The patient underwent a posterior decompression and fusion surgery from T9-L4. 11 days after the procedure, a CT was performed for staging purposes. Cement emboli within segmental and subsegmental branches of the pulmonary arteries bilaterally were incidentally found, along with redemonstration of lytic, osseous metastatic disease. Patient was asymptomatic without hypoxia or respiratory complaints, so no further treatment was needed. Bone and liver biopsies revealed the primary cancer to be Epstein Barr Virus positive plasmablastic lymphoma.

Discussion: PCE can be rare complications of spinal decompression and fusion surgery and are more often associated with vertebroplasty. PCE can be diagnosed with plain radiographs, but more commonly on CT. This particular patient was likely asymptomatic due to the location of PCE and his younger age. Although no further interventions were needed at the time of discovery of the emboli, careful monitoring is important. It is important to be aware of the potentially life-threatening cardiorespiratory symptoms that can occur, which may require treatment with anticoagulation and surgery depending on symptoms and location of PCE.

Poster #63

Category: Clinical Vignette

School: Wayne State University School of Medicine

Clerkship Director: Diane Levine, MD, FACP

Presenter: Omar Fernandez

Additional Authors: Zachary Hanna, MD; Erica Herc, MD; Robert Tibbetts, PhD; Shannon Rodgers, DO; Eileen Putnam; Anita Shallal, MD; Indira Brar, MD

### **Cryptococcal Meningitis Post-Zone Effect**

Cryptococcal meningitis is an AIDS-defining illness most commonly affecting patients with CD4+ T-cell counts <100 cells/uL. The culprit organism is *Cryptococcus neoformans*. The cryptococcal antigen (CrAg) is a component of the organism's glucuronoxylomannan polysaccharide capsule. This antigen is detected in the serum, plasma, or CSF by the cryptococcal antigen lateral flow assay (CrAg LFA), a highly sensitive and specific diagnostic test for cryptococcal meningitis. Our patient was a 30-year-old African American male with advanced HIV infection (CD4+ T-cell count 19 cell/uL and HIV viral load 402,638 copies/mL). He was admitted for nausea, vomiting, headache, and photophobia. The results of his lumbar puncture were suggestive of fungal meningitis [33 cm H<sub>2</sub>O opening pressure, 146 RBC/cu mm, 264 WBC/cu mm (70% lymphocytes, 25% neutrophils, 5% monocytes), protein of 66.1 mg/dL, glucose of 22 mg/dL] and India ink of the CSF demonstrated encapsulated yeast. However, the results of the initial CrAg LFA both in the serum and CSF were negative. Further dilution of the sample was required to obtain a positive titer. This is due to the post-zone phenomenon, which refers to an absence of antibody-antigen precipitation due to the presence of excess antigen, leading to a false-negative antigen test result in undiluted samples. False negative CrAg attributed to the post-zone phenomenon is rare, occurring in approximately 0.6% of cases. This could lead to a delay in treatment, whereas recognition of the post-zone phenomenon and dilution of the sample would result in improved sensitivity of the test. This case highlights the importance of further workup in patients with high clinical suspicion for cryptococcal meningitis and a negative CrAg LFA test result.

Poster #64

Category: Clinical Vignette

School: Wayne State University School of Medicine

Clerkship Director: Diane Levine, MD, FACP

Presenter: Michael Franklin

Additional Authors: Raef Fadel D.O., Abigail Entz M.D.

### **Euglycemic Diabetic Ketoacidosis (EDKA): A Masked Presentation of SGLT2 Effect**

Vignette:

A 48-year-old woman with a history of type 2 diabetes mellitus on SGLT2 therapy and obesity presented with nausea and vomiting of 1-week duration.

On presentation, she was hypertensive and tachycardic. Laboratory studies revealed mild hyperglycemia to 280 mg/dL with a glycated hemoglobin on 6.7%, an elevated beta-hydroxybutyrate level of 11.51 mmol/L, and an elevated anion gap of 28 with bicarbonate level of 18 mmol/L (baseline 32 mmol/L); venous blood gas revealed a pH of 7.40 (baseline over 7.50).

She was diagnosed with euglycemic diabetic ketoacidosis (EDKA). Treatment included intravenous fluid resuscitation, conservative insulin therapy, and discontinuation of SGLT2 medication, with prompt resolution of ketoacidosis and significant improvement in symptoms.

Discussion:

Here we present a case of EDKA due to chronic SGLT2 therapy. Despite initial laboratory markers not fitting this diagnosis outright, we offer several proposed explanations: 1) relative hyperglycemia was well out of proportion to the degree of ketosis and anion gap elevation, with a near normal glycated hemoglobin, suggesting hyperglycemia was due to a late presentation of ketosis and stress; 2) relatively normal pH was well below the patient's baseline given history of obesity with possible hypoventilation syndrome and sleep apnea; 3) low serum bicarbonate, again suggesting metabolic acidosis, was well below her baseline. Identification of discrepancies in presenting features and diagnostic criteria for EDKA allowed for prompt discontinuation of SGLT2 and conservative use of insulin therapy, with significant improvement in her symptoms.

SGL2 inhibitors have been associated with an increased risk of euglycemic diabetic ketoacidosis, highlighted by a black box warning from the FDA in 2015, due to several proposed mechanisms. SGLT2 inhibitors decrease beta-cell secretion of insulin, increase alpha-cell secretion of glucagon, and increase lipolysis and ketoacid production. Furthermore, increased insulin resistance and reabsorption of ketoacids at the kidney level exacerbate this effect.

Poster #65

Category: Clinical Vignette

School: Wayne State University School of Medicine

Clerkship Director: Diane Levine, MD, FACP

Presenter: Jacob Gluski

Additional Authors: Aseel Yaseen, MD; Megan Scott, MD

### **Acute Hepatitis B In Previously Vaccinated Non-Immunocompromised Adults**

Hepatitis B virus (HBV) infection is subclinical in approximately 70% of cases, while the rest develop icteric hepatitis. Only 0.1-0.5% present with fulminant hepatic failure, usually in the setting of underlying disease or coinfection with other hepatitis viruses. We report the case of a 32-year-old male who presented with lethargy, transaminases >1000, and an INR of 2.0 and was found to only have an acute HBV infection. The patient received a 3-dose HBV series in his adolescence, and a second 3-dose series of the TWINRIX HepA/B booster for work. The patient had none of the known risk factors for fulminant liver failure in acute HBV infection. The patient had no significant past medical history but reports having unprotected intercourse with other men (MSM). This case demonstrates, that although rare, HBV can cause liver failure in previously vaccinated individuals if they do not respond to the vaccine. Moreover, it highlights the importance of post-vaccination testing (PVT) for seroconversion in high risk groups. While this is already widely done for healthcare workers, more research should be done to evaluate PVT in MSM.

Poster #66

Category: Clinical Vignette

School: Wayne State University School of Medicine

Clerkship Director: Diane Levine, MD, FACP

Presenter: Aileen Haque

Additional Authors: Simran Bhatti, M.D.; Labib Debiane, M.D.

### **Atypical Presentation of a Pneumothorax Resolution Due to a History of Bullous Emphysema in the Setting of COVID-19**

Case Presentation: A 62 year-old-male with history significant for bullous emphysema and tobacco use presented with shortness of breath and left-sided chest pain. Patient was found to have left-sided pneumothorax on chest x-ray (CXR) and subsequently had a cook catheter placed. While hospitalized, patient tested COVID-19 positive and completed treatment: 7 days steroids, 5 days Remdesivir, and plasma. Patient had two chest tubes placed (apical and pigtail), which developed persistent air leaks. He then developed subcutaneous emphysema in the left-side of the neck and face; he was then transferred to the ICU. When evaluated by thoracic surgery, it was found that repairing the bullous emphysema would have a poor prognosis and instead recommended to undergo endobronchial valve placement. Patient was transferred to Henry Ford and seen by interventional pulmonology (IP), presenting in mild respiratory distress with variable oxygen requirements. After two weeks of clinical improvement, IP removed both chest tubes and afterwards patient's exam was stable: the left apical pneumothorax appeared unchanged, there was patchy peripheral airspace disease (inflammatory versus infectious) and a small left-sided effusion remaining in setting of bullous emphysema. Patient was recommended to follow-up in a few months for bullectomy.

Discussion: Bullous emphysema is a subset of chronic obstructive pulmonary disease where patients present with bullae, air-filled spaces greater than 1 cm in diameter, due to diffuse emphysematous destruction of lung parenchyma. These patients may be asymptomatic or develop shortness of breath, productive cough worse in mornings, wheezing, and/or pulmonary hypertension. There are few cases describing long-term pneumothorax complications in patients with severe bullous emphysema. Most patients have normal lung parenchyma after pneumothorax resolution due to proper lung re-expansion. However, those with bullous emphysema have permanent scarred/damaged tissue due to bullae expansion that prevents lung re-expansion, such as this patient, whose stable apical pneumothorax will persist long-term.

Poster #67

Category: Clinical Vignette

School: Wayne State University School of Medicine

Clerkship Director: Diane Levine, MD, FACP

Presenter: Alivia Knol

Additional Authors: Michael Kern MD, Zahra Alsultan MD, Bola Nashed MD

### **Metastatic Breast Cancer Discovered Incidentally on CT: A Case Report**

The majority of cases of breast cancer in the U.S. are detected at an early stage, while the cancer remains localized to the breast. However, if the primary breast lesion is very small, it may go undetected until the cancer is widespread, even with regular screening. About 6% of all women diagnosed with breast cancer have metastatic disease at the time of diagnosis. This was unfortunately the case for a 75 year old lady who presented to the emergency department with abdominal pain. Regarding the cause of her abdominal pain, a CT scan of the abdomen and pelvis revealed epiploic appendicitis, which is a rare but benign condition. However, a very important incidental finding was also made on this CT scan—innumerable osseous sclerotic lesions all throughout the patient's skeleton, consistent with metastasis from an unknown primary cancer. The patient had a biopsy of her T10 vertebra, and the pathology was consistent with metastatic breast cancer. After her vertebral biopsy, the patient went on to have a diagnostic 3D digital mammogram, which was completely unremarkable, as well as a benign bilateral breast ultrasound. Finally, the patient underwent a breast MRI, the most sensitive test for detecting breast cancer, which showed a very small 7 x 4 mm suspicious lesion in the left breast. The significance of this lesion was still ambiguous enough that she would need a biopsy to confirm this as the site of her primary cancer. This patient's unique presentation of breast cancer demonstrates the potential for a very small primary cancer to lead to extensive metastatic disease. Even with the availability of the most sensitive imaging modalities for screening, it is inevitable that a certain proportion of breast cancers will present at a late stage because of their insidious nature.

Poster #68

Category: Clinical Vignette

School: Wayne State University School of Medicine

Clerkship Director: Diane Levine, MD, FACP

Presenter: Hannah Lowe

Additional Authors: Stephanie Tancer, MD, Timothy Bowman, MD Department of Internal Medicine Henry Ford Health System

### **Blind Sided: An Unusual Presentation of Bilateral Acute Retinal Necrosis**

#### Intro

Acute retinal necrosis (ARN) is a rare viral syndrome characterized by panuveitis and necrotizing retinitis most frequently caused by VZV. It typically presents with sudden unilateral vision loss. We present a case of bilateral ARN that initially presented as unilateral eye redness and progressive vision loss.

#### Case Report

A 76-year old female with a PMH significant for hypertension presented with bilateral vision loss. A month prior, she had progressive left sided vision loss and eye redness diagnosed as uveitis. Ten days later, she reported near complete vision loss despite treatment with prednisolone and atropine eyedrops. Oral prednisone 40mg/day and timolol drops were added. One week later, the patient reported near complete blindness in the right eye as well. Fundus photo mapping showed bilateral panuveitis, retinal whitening in the right eye without a view of the left, and vitreal cells bilaterally indicative of bilateral ARN. Foscarnet and ganciclovir intravitreal injections and vitreal taps were performed for culture and coverage. IV acyclovir was started with continued oral steroids, bactrim, and eye drops. Cultures returned VZV positive. Patient was treated with a week of IV acyclovir and five weeks of oral valacyclovir, prednisolone and atropine eye drops, two-week steroid regimen with taper, and follow-up completed outpatient. With treatment, there was mild improvement in right eye vision. However, vision loss was still significant bilaterally.

#### Discussion

ARN is characterized by severe panuveitis, retinal vasculitis, and necrotizing retinitis. VZV is the most frequent etiology with estimates of over 50% of cases. Per one incidence study, most common presentation is sudden visual loss and ocular pain, but only 16% of cases presented with red eye. Rarity of the case and abnormal presentation of painless red eye followed by gradual vision loss in the presenting eye likely contributed to a delay in diagnosis and treatment.

Poster #69

Category: Clinical Vignette

School: Wayne State University School of Medicine

Clerkship Director: Diane Levine, MD, FACP

Presenter: Ahila Manivannan

Additional Authors: Dr. Maher Musleh DO, Dr. Omar Turk DO, Dr. Jeffrey Jennings MD

### **Pembrolizumab Induced Hypophysitis**

Background: Immunotherapy has revolutionized cancer therapy. By blocking PD-1 receptors on malignant cells, pembrolizumab allows the immune system to recognize and kill cancer cells. Their tendency to sensitize and heighten the immune response, however, can cause unwanted inflammation in healthy tissue. Cases of adverse endocrine related inflammatory events are becoming common.

Case: A 56 year old male with a past medical history of stage IV adenocarcinoma of the lung and DVT on Eliquis presented with 2 weeks of fatigue and dyspnea. CT PE revealed an acute subsegmental right lower lobe pulmonary embolism. The patient had started palliative chemotherapy with pembrolizumab, carboplatin, and pemetrexed a few weeks prior to presentation. He was admitted to the ICU and given IV fluids to help correct hypernatremia. Soon after admission, he began to have large volume bowel movements (7 L of diarrhea, per day). Stool C. diff, O+P, and bacterial PCR were negative. Imodium was scheduled, and thereafter, his diarrhea improved. Soon after, however, urine output started to rise. He produced up to 9L daily. Urine studies revealed low sodium and osmolality. DDAVP was initiated with improvement in serum sodium and urine output. His course was then complicated by hypotension and encephalopathy. Lab work revealed low serum ACTH and cortisol as well as secondary hypogonadism. MRI brain was obtained and revealed findings consistent with lymphocytic infundibular pan hypophysitis. The diagnosis of PD-1 inhibitor immunotherapy induced hypophysitis was made. The patient was started on methylprednisone for immune related hypophysitis and showed clinical improvement, since. Discussion: Pembrolizumab-induced hypophysitis has an incidence of less than 1%. Our case demonstrates the importance of having clinical awareness of the rare, yet salient endocrine related side effects that can occur with immunotherapy. Attempts to stabilize these patients with supportive care and steroids are paramount for recovery.

Poster #70

Category: Research

School: Wayne State University School of Medicine

Clerkship Director: Diane Levine, MD, FACP

Presenter: Arif Musa

Additional Authors: Elizabeth Warbasse, Jenna Yousif, David A Baron, Susan Stevens, Emily Blodget, Kasim Pendi, Khalid Kamal, Sarkis Kouyoumjian

### **Intravenous Remdesivir (RDV) for the Treatment of COVID-19: A Meta-Analysis of Randomized Trials**

**Introduction:** The unprecedented global pandemic of Coronavirus Disease 2019 (COVID-19) has led to over 12 million confirmed cases and over 500,000 deaths. Remdesivir (RDV), an adenosine analog pro-drug, has shown effectiveness in previous in vitro and clinical studies. However, these studies are preliminary with small sample sizes and conflicting findings. As a result, we performed a meta-analysis of randomized, controlled trials to compare intravenous RDV to control in human patients with COVID-19. **Methods:** We performed a meta-analysis following a comprehensive literature search of EMBASE, PubMed, Web of Science, and several clinical trials registries. After two reviewers reviewed the studies, those that met inclusion criteria were included. Standardized mean difference (SMD) and 95% Confidence Intervals (CI) were used for continuous outcomes and odds ratio (OR) and 95% CI were used for dichotomous outcomes. **Results:** RDV significantly reduced ordinal scores ( $2.4 \pm 1.7$  vs  $2.8 \pm 1.9$ , SMD = -0.21, 95% CI = -0.33 to -0.09,  $p < 0.001$ ), indicating clinical improvement, and significantly reduced mortality (6.8% vs 10.2%, OR = 0.62, 95% CI = 0.41 to 0.94,  $p = 0.02$ ). The use of RDV did not significantly increase anemia, acute kidney injury, cardiac arrest, deep vein thrombosis, pulmonary embolism, respiratory failure, or septic shock (all  $ps > 0.05$ ). **Conclusions:** Intravenous RDV significantly improves clinical status and reduces mortality in patients with COVID-19 without increasing the risk for complications. Further studies are needed to complete the side-effects profile and to optimize dosing, timing, and course.

Poster #71

Category: Research

School: Wayne State University School of Medicine

Clerkship Director: Diane Levine, MD, FACP

Presenter: Sarah Nasser

Additional Authors: Katherine Wong, Paul Naylor, Murray Ehrinpreis, Milton Mutchnick

### **Comparison of Fibroscan to Serum Based Assessment of Fibrosis for Identifying Cirrhosis in a Predominately African American Patient**

**Introduction:** Non-invasive identification of Hepatitis C (HCV) infected patients is complicated. Serum based assays and direct measurement using Ultrasound based Transient Elastography (TE) by FibroScan are often used. The objective of our study was to compare FibroScan to serum-based assays to identify and follow patients with cirrhosis in our primarily African American (AA) HCV patients.

**Methods:** Of 332 individuals with a FibroScan between 2014 and 2016, 79 (24%) had a score of >12.5 kPa, signifying cirrhosis. AST to Platelet Ratio Index (APRI) and Fibrosis-4 (FIB-4) scores were calculated within a year of the FibroScan. An APRI score >0.7 and FIB-4 score >3.25 was used for predicting advanced fibrosis/cirrhosis.

**Results:** Cirrhotic patients with HCV (n= 74) were 83 % AA, 52% male, and the average age was 61 years. FibroScan values ranged from 13.2 to 75 with a mean of 25.1 kPa for AA and 28.0 kPa for Non-AA. Most HCV patients (82%) were treated after their initial FibroScan with a high sustained virologic response (SVR) rate (97%).

In patients who had FibroScan-defined cirrhosis, their APRI and FIB-4 scores were not as reliable in identifying patients with cirrhosis. Outcomes for patients with HCV were tracked using 1) improvement in FibroScan scores and 2) development of decompensated cirrhosis. There was a statistically significant improvement in FibroScan defined fibrosis of the patients who achieved SVR but not the non-treated patients ( $p<0.005$ ). Only 1/40 (3%) developed decompensation in the SVR group as compared to 3/5 (60%) non-responders or untreated patients ( $p<0.0001$ ).

**Conclusion:** FibroScan is superior to serum-based assays for identifying cirrhosis in a predominantly AA population. Fibroscan is also useful for evaluating regression of fibrosis after HCV eradication. Accurate non-invasive identification of cirrhotic patients is important ongoing surveillance for hepatocellular carcinoma and esophageal varices both before and after HCV eradication.

Poster #72

Category: Clinical Vignette

School: Wayne State University School of Medicine

Clerkship Director: Diane Levine, MD, FACP

Presenter: Muhammad Osto

Additional Authors: Thomas McCune, Radhika Gaddipati MD

### **Pulmonary Embolism from worsening of Gouty Arthritis due to the COVID-19 Pandemic**

Gout is the most common inflammatory arthritis in men and is associated with increased mortality and is an independent risk factor for cardiovascular disease such as myocardial infarction and stroke. In addition, several other types of inflammatory arthritis have been linked to increased risk of venous thromboembolism (VTE). VTE is associated high mortality of around 9.7% for PE and 4.6% for DVT. However, only a handful of studies have been conducted to estimate the risk of VTE in patients with gout before or after diagnosis. Most recent study in Canada concluded that patients with gout have around a 20% increase in risk compared to the general population for VTE. However, they stated not all gout patients carry the same risk and further research is needed to identify high risk factors and implement prophylactic therapy. In addition to that, multiple studies have concluded that alcohol sales, mental health illness, and drug use has increased dramatically during the COVID-19 pandemic. We present an interesting case of a 64-year-old patient with history of chronic gout which worsened within the last six months, first leading to DVT and a few months later a submassive pulmonary embolism (PE). The patient had multiple high-risk factors for PE including chronic gout with worsening flare ups due to the excessive alcohol drinking since the COVID-19 pandemic and recent non-adherence to DVT anticoagulant medication for a month. We highlight the importance to monitor for high-risk factors such as excessive alcohol use and immobility in patients with inflammatory condition such as gout especially during the COVID pandemic.

Poster #73

Category: Clinical Vignette

School: Wayne State University School of Medicine

Clerkship Director: Diane Levine, MD, FACP

Presenter: Rujuta Patil

Additional Authors: Dr. Ahmed Oudeif

### **Case Report: Indoxacarb Toxicity-Related Acute Hypoxemic Respiratory Distress**

Indoxacarb is a commonly used oxadiazine pesticide. We report a unique presentation of Indoxacarb exposure.

A 28-year-old Arabic speaking female with history of hemochromatosis, ESRD, and hypertension presented with shortness of breath. She had woken up at 3:00 a.m. with left lower chest pain, left upper quadrant abdominal pain, a productive cough, and a fever. She was hypertensive (BP 134/73 mmHg), tachycardic (HR 145/min), tachypneic (RR 40/min), febrile (oral temperature of 38.4 °C), and had a SpO<sub>2</sub> of 96%.

Initial labs noted elevated BNP (1,778 pg/mL), a negative troponin, elevated lactate (2.7 mmol/L), elevated anion gap (16), and elevated procalcitonin (12.98 ng/mL), suggesting infection or inflammation but without leukocytosis. Chest x-ray showed diffuse bilateral mid and lower lung opacities concerning for multilobar pneumonia versus pneumonitis; it is likely she had a combination of both. Treatment included intravenous crystalloids and Vancomycin and Cefepime for suspected pneumonia. She was placed shortly on BIPAP (15/5 cmH<sub>2</sub>O, 100% FiO<sub>2</sub>) and also developed hyperkalemia (6.9 mmol/L), treated with hemodialysis.

On day 2, she became hemodynamically stable and complained of a residual cough. Due to a language barrier, a proper history was not initially obtained. Upon further questioning, the patient stated she was exposed to Indoxacarb 2 hours prior to abruptly developing her presenting symptoms; she denied any ingestion. She was discharged with a cough suppressant.

Other case reports demonstrate Indoxacarb ingestion/exposure related methemoglobinemia; all cases were treated with methylene blue. Our patient's presentation was unique as initial pesticide exposure was not identified, there was no methemoglobinemia present, and she was successfully treated for ARDS symptoms. Our case also highlights the necessity of obtaining a proper history, despite language barriers. Overall, Indoxacarb toxicity manifests with a variety of symptoms and clinicians should consider it as a differential diagnosis in patients presenting with acute hypoxemic respiratory distress.

Poster #74

Category: Research

School: Wayne State University School of Medicine

Clerkship Director: Diane Levine, MD, FACP

Presenter: Anneliese Petersen

Additional Authors: Richard Bryce, DO

### **Impact of COVID-19 on Service Utilization by Those Experiencing Homelessness in Detroit**

#### Background:

Current research has demonstrated increased levels of fear and anxiety due to the Coronavirus pandemic. While fear can have a significant impact on any individual, fear among individuals experiencing homelessness is particularly impactful as this may affect service utilization and thus the ability of to access basic necessities such as food, shelter and water. This study seeks to understand the impact of fear of contracting COVID on service utilization among those experiencing homelessness in Detroit, MI.

#### Methods and Results:

From July-August 2020, 35 individuals who self-identified as homeless participated in a multiple-choice survey. 40% of surveyed individuals stated that they experienced fear of contracting COVID-19. None of the individuals who primarily stayed in shelters over the last six months reported such fear, whereas 48% of rough sleepers reported experiencing fear. 83% of those who did not stay in a shelter stated that they chose not to stay in a shelter that they otherwise would have due to fear of COVID-19. Of those who primarily relied on community resources for food, 23% stated that they did not use these resources during March, April or May of 2020, and 60% of these individuals said that this decision was due to fear of contracting COVID.

#### Conclusions:

Fear of contracting COVID-19 is present among the homeless population and impacted the use of community resources in Detroit. Specifically, individuals who normally rely on community shelters and food distributions chose not to frequent these services out of fear of contracting the coronavirus.

Poster #75

Category: Research

School: Wayne State University School of Medicine

Clerkship Director: Diane Levine, MD, FACP

Presenter: Narmeen Rehman

Additional Authors: Ho Jun Yun, MS1, Rachel Monconduit, MS1, Jacob Hoofman, MS1, Jennifer Mendez, Ph.D

### **Innovative Health Information Visualization for Patient Education and Clinical Reasoning**

**Background:** Health information visualization through methods, such as infographics, have shown to facilitate this process, improving patient engagement and comprehension of information across differing levels of health literacy. The aim of this study was to determine the effectiveness of evidence-based infographic development in facilitating medical student skills in identifying, evaluating, and translating complex health information to a non-medical audience.

**Design:** The first-year medical students at Wayne State University School of Medicine were assigned to groups of six to create an infographic about disproving a myth in relation to COVID-19. The assignment was divided into four steps: (1) conducting a literature search, (2) evaluating literature, (3) creating an infographic, and (4) presenting this information to a community partner. A survey was disseminated to students to assess the efficacy of the project in the aims stated above.

**Results:** Ninety-two students (31.7%) responded to the survey. Seventy percent of the sample agreed that they were able to apply medical knowledge to develop infographics. The majority (89.4%) indicated infographics were effective for patient education. Seventy-three percent noted improved skills in communicating health information to a non-medical audience. More than half of the respondents (65.6%) explained that the project helped them be more informed about COVID-19. Challenges encountered by the students included selecting information to put on the infographic (23.9%), conducting literature search (23.9%), and evaluating the articles from the literature search (21.6%).

**Conclusion:** With a growing body of new information on COVID-19 and misinformation, this project positioned students to practice translating complex health literature to be consumed across health literacy levels at a critical time. The results reflected challenges in locating reliable literature on COVID-19 and translating this information to the target audience, highlighting the importance of integrating evidence-based medicine into medical student training. The findings demonstrated improvement in students' communication skills to non-medical audiences through infographic development.

Poster #76

Category: Research

School: Wayne State University School of Medicine

Clerkship Director: Diane Levine, MD, FACP

Presenter: Siri Sarvepalli

Additional Authors: Said El Zein MD, Pranatharthi Chandrasekar MD

### **The Prevalence of Co-Infections in Hospitalized Patients with COVID-19**

**Introduction:** The Coronavirus disease 2019 (COVID-19) pandemic emerged in 2020 and significantly altered the landscape of healthcare delivery. With the absence of a cure, treatment of hospitalized patients with COVID-19 has been particularly challenging. Physicians often treat hospitalized patients empirically with broad-spectrum antibiotics on admission due to concerns of missing an underlying, treatable co-infection. In this study, we aim to determine the rate of co-infections in hospitalized patients with SARS-CoV-2.

**Methods:** We conducted a retrospective study which included all patients who had a nasopharyngeal swab sample positive for SARS-CoV-2 infection detected by the Cepheid Real-Time Polymerase Chain Reaction (RT-PCT) test at the Detroit Medical Center in April 2020. The results of sputum and blood cultures ordered were examined, and the isolated organisms and date of the culture positivity were documented. We analyzed the results of non-culture tests such as urine legionella antigen, urine pneumococcal antigen, and influenza PCR.

**Results:** 94 patients had a respiratory culture ordered of which 38 (40%) returned positive. Of these 38 patients, 12 patients had a positive culture within three days of admission. A total of 296 patients had a blood culture ordered of which 30 (10%) returned positive. Of these 30 patients, 21 patients had a positive culture within the first three days of admission. 126 urine legionella antigen tests were obtained, and 0 were positive. 125 urine pneumococcal antigens ordered, and only 4 (3.1%) were positive. 221 patients were tested for Influenza A and B PCR, and 0 tested positive.

**Conclusions:** Community acquired co-infections in patients hospitalized with SARS-CoV-2 appear to be uncommon based on our study. When a co-infection is suspected in critically ill patients, physicians should obtain respiratory and blood cultures before initiating empiric therapy. Empiric antibiotic therapy on admission does not appear to be warranted in the majority of patients.

Poster #77

Category: Clinical Vignette

School: Wayne State University School of Medicine

Clerkship Director: Diane Levine, MD, FACP

Presenter: Victoria Webber

Additional Authors: Dr. Manmeet Singh

**Persistent Sars-Cov-2 Antigen Positive Status; Challenges in Management and Implications on Mental Health/Wellbeing/Perceived Quality**

Contact precautions remain necessary for infection control but isolation may lead to adverse health outcomes. With the increased use of contact precautions during the COVID-19 pandemic, it is imperative that healthcare teams are vigilant in efforts to mitigate negative outcomes associated with prolonged isolation.

A 69-year-old man with advanced diffuse large B-cell lymphoma was diagnosed with Sars-Cov-2 infection in August 2020. Despite treatment, his dyspnea and generalized weakness persisted. Throughout multiple admissions, he stayed positive for Sars-Cov-2, as was the case during our encounter in November 2020. Evolving Pulmonary Fibrosis was radiologically diagnosed, and we treated him with high dose steroids (Assuming a process similar to COP-Cryptogenic Organizing Pneumonia) to which he responded favorably.

During all his protracted hospitalizations he was kept in strict isolation. He yearned for company and to be around his son and wife. Eventually, he became despondent and expressed the wish to 'die' rather than live in this 'plight'. He was found to be severely depressed, though not suicidal. He described in explicit detail how he felt totally hopeless and compared his isolated existence to being 'worse than death'. Considering the need for healthy company, we expeditiously discharged him home to be around his loved ones.

This case underscores four points: First, the importance of screening for deteriorating mental health in patients during isolation. Based on our experience, we suggest early screening and working closely with patients and families to mitigate any possible negative outcomes. Second, we share the interesting observation of persistent COVID positive status in a profoundly immunocompromised patient. Third is the observation of decreasing virus particle load over time. Fourth, we wonder if Sars-cov-2 may have a biological effect on the nervous system/endocrine system thereby explaining its association with depression.

Poster #78

Category: Research

School: Wayne State University School of Medicine

Clerkship Director: Diane Levine, MD, FACP

Presenter: Lucki Word

Additional Authors: Melanie Hanna-Johnson, MD, MHSA, Anil N. F. Aranha, PhD

### **Assessment of Sexual Health Knowledge in a Metropolitan Patient Populace: Development of a Digital Educational Tool**

**Purpose:** Proficiency in the basics of sexual and reproductive health knowledge is crucial for the wellbeing of all individuals. Today, the prevalence of digital platforms and search engines have made obtaining information about any topic of significance a speedy, simplistic task. Our study aims to assess sexual health knowledge (SHK), and to determine how the incidence, as well as form of social communications can be used to boost gaps in SHK.

**Methods:** A 50 item evaluation tool, featuring inquiries of sociodemographics, amount and type of social interactions, and SHK was designed to evaluate sexual and reproductive health knowledge. Of the 50-item evaluation tool, 18 queries were knowledge questions, with solely one correct answer. One point was allotted for correct responses, permitting a maximum score of 18. The evaluation tool was administered to complying adult patients in two ambulatory, metropolitan primary care settings. Data was coded and analyzed using IBM-SPSS. Statistical analysis included: Pearson correlation ( $r$ ),  $t$  and Chi-squared tests. Statistical significance was established at  $p < 0.05$ .

**Results:** 352 patients, mean age  $55.3 \pm 14.6$  years,  $14.1 \pm 2.5$  years of schooling, 81.5% female, 84.3% African American, 64.4% had incomes  $< \$ 50,000$ , and an overall SHK score of  $10.2 \pm 3.6$ , on a scale of 0-18. SHK gaps were also noted. The magnitude of digital interactions ( $p < 0.001$ ), as well as the sum of face-to-face social interactions, which included weekly visits with relatives, neighbors, and friends, both were found to be positively correlated to SHK score.

**Conclusions:** Our findings showcase deficits of SHK, based on sociodemographic factors. Direct links between the quantity of digital and social interactions and SHK were observed.

Supplementary research efforts to develop a digital curriculum, enabling the advancement of sexual and reproductive health knowledge are currently in process.

Poster #79

Category: Clinical Vignette

School: Wayne State University School of Medicine

Clerkship Director: Diane Levine, MD, FACP

Presenter: Ho Jun Yun

Additional Authors: Yuchuan Ding, MD, PhD

### **Non-Invasive Therapies for Chronic Subdural Hematoma: How to Make Those Bloody Collections Gone**

Chronic subdural hematoma (CSDH) is one of the most prevalent neurosurgical disorders. Patients with CSDH commonly present with altered mental status, focal neurological deficit, and/or headache. The first-line treatment for CSDH is surgical evacuation. Although the surgical procedures for CSDH have been considered relatively “straightforward,” they are not without any risk. Elderly patients are especially vulnerable for poor surgical outcomes. To make matters worse, elderly individuals are commonly placed on anticoagulants and antiplatelet agents, increasing the risk of rebleeding before and after any surgery. These complications have led clinicians to search non-invasive treatment options. Dexamethasone may be effective as an adjunct to surgery. Its clinical benefits are comparable to surgery alone. However, more level 1 evidence studies are needed to affirm the efficacy of dexamethasone. Given the known side effects, dexamethasone should be used with caution for selected patients. More randomized clinical trials are needed to evaluate the definitive efficacy of tranexamic acid (TXA). Nevertheless, available evidence indicates reduced volume of hematomas and minimal complications with TXA. TXA may be utilized as an adjunct therapy to surgery for now. Numerous cases have reported the benefit of middle meningeal artery embolization (MMAE), especially for recurrent CSDH. However, the risks associated with MMAE, including intracerebral hemorrhage, stroke, and vasospasm, have not been properly studied yet. Clinical benefits of atorvastatin and angiotensin-converting enzyme (ACE) inhibitors are unclear to warrant its usage for CSDH. In conclusion, surgical intervention continues to be the first-line treatment while non-invasive treatment options may be considered as an adjunct therapy for recurrent hematoma or to reduce the volume of a hematoma. Developing new guidelines, including these alternative therapies, is desirable. Meanwhile, making individualized treatment decisions for each patient remains to be critical.

Poster #80

Category: CQI/EBM

School: Wayne State University School of Medicine

Clerkship Director: Diane Levine, MD, FACP

Presenter: Eugenia Zeng

Additional Authors: Deepa Daryani, Siri Sarvepalli, Samia Jaffar, Tekiyah Shabazz, Heather Abraham MD

### **Improving Chlamydia Screening Rates in Women Ages 16-24 in Detroit-GMAP Clinic**

Chlamydia is the most reported sexually transmitted infection (STI), causing complications such as pelvic inflammatory disease, infertility, and increased risk of contracting HIV. Because of Chlamydia's indolent course, screening is vital in preventing complications. According to HEDIS data in 2017, women aged 16-24 were screened at a rate of 40-60%. The purpose of this study is to increase the screening rate within the Detroit-GMAP clinic in accordance with the HEDIS metric.

The best screening tool was a urine sample due to its ease of administration into clinic flow. Throughout July-September 2019, two interventions were employed, including notes attached to laptops reminding staff to provide urine cups to all patients and disbursement of STI screening education. Screening rates were compared between 2018 and July-September 2019. Pre-tests and post-tests were administered to health care providers to gauge barriers and relative importance of screening.

In 2018, 113 out of 356 patients were screened, compounding a rate of 31.7%. Pre-test survey results found that 92% of providers viewed screening as important. 40% of providers believed patients should be screened frequently. For provider reasoning to not screen patients, 41.9% of providers stated other competing priorities, 32.4% stated patients were not at risk for STIs, and 20.3% stated patients had no symptoms. 56% of providers felt their patients were interested in screening. 55.4% of providers believed it was best to include screening in the normal patient check-in process. Post-test results were not significantly different compared to pre-test results using the McNemar test.

After analyzing the results from one PDSA cycle, a second cycle is planned to include two additional interventions, including a script for staff to explain to patients the reasons for urine cup screening and an educational presentation to providers to enhance their understanding of screening. Educational interventions and screening compliance will continue to be monitored.

Poster #81

Category: Clinical Vignette

School: Western Michigan University School of Medicine

Clerkship Director: Melissa Olken, MD, ACP Member

Presenter: Keenan Boulnemour

Additional Authors: Laura Bauler, PhD, Alyssa Erskine, DO, Mark Schauer, MD

### **Emotional Lability in an Atypical Acute Lymphoblastic Leukemia Patient with Methotrexate-Induced Leukoencephalopathy**

#### Introduction:

The manifestation of intrathecal (IT) methotrexate toxicity in patients with acute lymphoblastic leukemia (ALL) has been well documented in young patients. Adults with B-cell ALL is uncommon but there are few recorded cases. Managing adverse effects is therefore an underrepresented part of the present literature.

#### Case Description:

The following is a case with a triad of unique events: A 26-year-old patient with B-cell predominant ALL, the unique presenting symptom of emotional lability in addition to common symptoms of methotrexate-induced encephalopathy, and unique oral treatment for leucovorin-refractory neurotoxicity. Upon hospital admission for slurred speech and emotional outbursts followed by stroke-like symptoms, a full workup revealed central nervous system (CNS) toxicity following the patient's tenth cycle of chemotherapy. An initial leucovorin rescue did not resolve the patient's neurological symptoms within 24 hours, necessitating dextromethorphan-guaifenesin administration to limit the methotrexate toxicity. The patient displayed steady improvement over the following 4 days. The slurred speech, stroke-like symptoms, and imaging findings enabled prompt identification of methotrexate-induced leukoencephalopathy.

#### Discussion/Conclusions:

Emotional lability is a symptom of methotrexate-induced CNS toxicity that is rarely documented in published cases. However, the display of extreme emotional outbursts may provide an early indication of methotrexate-induced encephalopathy. The triad of unique events, in this case, suggests that patients with atypical demographics for a disease may present with unique symptoms that do not respond to standard treatment measures.

Poster #82

Category: Clinical Vignette

School: Western Michigan University School of Medicine

Clerkship Director: Melissa Olken, MD, ACP Member

Presenter: Arianna Letherer

Additional Authors: Dr. Prashant Patel

### **Ictal-Induced Bradyarrhythmia as a Rare but Important Cause of Death in Epileptics**

#### Introduction:

Cardiac asystole is a rare but important cause of sudden unexpected death in epilepsy (SUDEP), accounting for 2-18% of epileptic deaths. As our case highlights, ictal-induced bradyarrhythmia, occurring in < 0.5% of patients with epilepsy, is a sequence with significant cardiovascular consequences.

#### Case Presentation

A 60-year-old female with a history of complex partial epilepsy (controlled on carbamazepine, with worsening in recent weeks) was brought into the emergency department after witnessed seizure-like activity. On arrival, she had returned to her baseline, but became unresponsive with cardiac arrest. After cardiopulmonary resuscitation was initiated, she had return of spontaneous circulation within 30 seconds and was in normal sinus rhythm. She again returned to her baseline neurologic state without deficits and stated she was feeling better. Prior to her arrest, her rhythm strip showed bradycardia and then asystole. During her admission, her transthoracic echocardiogram showed no ventricular abnormalities or valvulopathy. Cardiac computed tomography showed no significant coronary artery disease. A permanent pacemaker was placed prior to discharge.

#### Discussion

The patient's presentation is consistent with ictal-induced cardiac bradyarrhythmia, one of multiple proposed mechanisms of SUDEP. In this condition, it is proposed that patients first have a complex partial seizure which is followed by tachycardia then bradycardia, then asystole within 30 seconds of seizure onset. As discovered while caring for our patient, there are very few recommendations available for patients with ictal induced bradyarrhythmia. Per Bestawros et al., for patients with suspected ictal-induced bradyarrhythmia > 6 seconds, it is plausible to place a permanent pacemaker for secondary prevention of loss of postural tone and dangerous cardiovascular outcomes. While ictal induced bradyarrhythmia is documented rarely, it is possible that it is a preceding event to cases of SUDEP. Further awareness and research into the treatment and prevention of this condition could make a significant difference in patients' lives

Poster #83

Category: Clinical Vignette

School: Western Michigan University School of Medicine

Clerkship Director: Melissa Olken, MD, ACP Member

Presenter: Drew Moss

Additional Authors: Lucas Rich, Nicholas Helmstetter

### **Status Cataplecticus: A Case Where Less Isn't More**

**Introduction:** Narcolepsy is a rare hypothalamic disorder of orexin deficiency characterized by excessive daytime sleepiness, cataplexy, hallucinations, and sleep paralysis with a prevalence of 200-500 cases per million individuals in North America. Cataplexy, the only specific symptom of narcolepsy, is a sudden loss of muscle tone with retained consciousness often precipitated by strong emotion. Recurrent cataplexy--status cataplecticus--is described in case reports following withdrawal or interruption of anticataplectic medications. We present the case of a patient who developed status cataplecticus following brief interruption of sodium oxybate and venlafaxine dosing.

**Case:** A 30-year-old woman with a past medical history of narcolepsy with cataplexy, migraine with brainstem aura, and generalized anxiety disorder presented to the emergency department with one week of recurrent episodes of transient weakness lasting several minutes. On presentation, her vital signs were stable and neurologic examination was unremarkable. Initial lab workup and MRI brain without contrast were unremarkable. Continuous video electroencephalogram captured four back-to-back spells lasting several minutes characterized by global loss of muscle tone with unresponsiveness to noxious stimuli and blink-to-threat challenge with intact consciousness. No interictal epileptiform discharges were recorded and there was initial concern for psychogenic nonepileptic seizures (PNES). Further history revealed brief interruption of sodium oxybate and venlafaxine dosing after recently transitioning to working nights. After restarting her medication regimen with diligent adherence her symptoms resolved without recurrence at one-year follow-up.

**Discussion:** Sodium oxybate is the only approved medication for cataplexy, however antidepressants including selective serotonin-norepinephrine reuptake inhibitors are commonly prescribed off-label or concomitantly. Upon discontinuation, the precipitous decrease in serotonergic and noradrenergic tone is postulated to trigger rebound cataplexy, and rarely status cataplecticus, within one week. Our patient's case highlights the importance of recognizing this rare but reversible complication, which, when overlooked, may result in the stigmatizing diagnosis of PNES and over-medicalization.

Poster #84

Category: Clinical Vignette

School: Western Michigan University School of Medicine

Clerkship Director: Melissa Olken, MD, ACP Member

Presenter: Keshav Patel

Additional Authors: Dilpat Kumar, MD; Aditya Mehta, MD; Nicholas Helmstetter MD, FAAP

### **Initial presentation of RCC as Heart Failure Secondary to Tumor-Thrombus Extension to the Right Atrium**

Introduction: Renal Cell Carcinoma (RCC) can invade through the renal vein and into the inferior vena cava (IVC) with tumor-thrombus formation reported in 5-15% of patients(1,2). From the IVC, RCC can grow intravascularly and extend into the right atrium. RCC extension to the right side of the heart is a rare complication that occurs in approximately 1% of RCC patients(1,2). We present a rare case of RCC tumor-thrombus extension into the right atrium resulting in a 6.9 cm x 3.8 cm solid mass and the unusual initial presentation of RCC as heart failure (HF).

Case: A 69-year-old woman with a past medical history of hypertension and coronary artery disease presented with fatigue and dyspnea on exertion. Physical exam revealed jugular venous distension and faint bibasilar rales. Electrocardiogram and troponin levels were normal. Chest x-ray revealed pulmonary vascular congestion and computed tomography revealed a large right-sided renal mass with enlargement of the renal vein suggestive of tumor thrombus. Echocardiography revealed a dilated right atrium with a 6.9 cm x 3.8 cm solid mass consistent with a tumor impinging on the tricuspid valve leading to a functional stenosis. The patient was referred for oncological and surgical evaluation.

Discussion: Our patient presented with two uncommon findings: tumor-thrombus extension leading to a 6.9 cm x 3.8 cm right atrial mass and initial presentation of RCC as HF. The RCC classic triad of flank pain, hematuria, and a palpable abdominal mass is only found in 6-10% of patients(3-5). Although initial presentation of RCC with cardiac symptoms is surprising, this case highlights the importance of maintaining a comprehensive differential diagnosis. It also signifies the need for further imaging as not all atrial masses are myxomas. Many other primary tumors—kidney, liver, lung, and thyroid—can directly invade into the atrium by way of the vena cava.

Poster #85

Category: Clinical Vignette

School: Western Michigan University School of Medicine

Clerkship Director: Melissa Olken, MD, ACP Member

Presenter: Lucas Rich

Additional Authors: Ryan Khalil B.S., Ricardo de Castro M.D., Prashant Patel D.O.

### **Out of Sync, Tick-Start My Heart: A Case of Lyme Carditis**

#### Introduction:

Lyme disease is an infection by the spirochete *Borrelia burgdorferi* transmitted by the Ixodes tick in the Northeast and upper Midwest. Of the estimated ~300,000 cases/year, ~4% develop Lyme carditis as a consequence of early disseminated disease, manifesting as atrioventricular block (AVB) and less frequently as myopericarditis or valvular disease. We present a case Lyme disease presenting as a new-onset AVB.

#### Case:

A healthy 18-year-old male presented to the emergency department with one week of multiple erythematous circular rashes and acute-onset palpitations, night sweats, and left shoulder pain. His initial vital signs revealed tachycardia to 116 bpm and a blood pressure of 102/62, but otherwise stable. Physical exam was remarkable for an irregular rhythm and numerous erythema migrans rashes on his torso and extremities. Laboratory workup revealed leukocytosis, markedly elevated C-reactive protein and erythrocyte sedimentation rate, and normal troponin. ECG demonstrated a 2nd degree AVB with fixed 2:1 A-V conduction. Following admission for presumed Lyme carditis, empiric ceftriaxone was started leading to symptomatic improvement and serial resolution of ECG abnormalities. Lyme serology returned positive for IgM and negative for IgG. He was discharged with oral doxycycline to complete a total 3-week antibiotic course.

#### Discussion:

Prompt identification of Lyme carditis is critical, but challenging, as only 40% of patients present with erythema migrans. Per Besant et al., the Suspicious Index in Lyme Carditis (SILC) predicts the likelihood of Lyme carditis in patients presenting with high-degree AV block with a sensitivity >93%. Patients with high-degree AVB should be hospitalized for cardiac monitoring and parenteral antibiotics, until restoration of 1:1 A-V conduction before transitioning to oral antibiotics. If high-degree AVB persists, a temporary or permanent pacemaker implantation may be necessary. Our patient's case highlights a rare but reversible cause of high-degree AVB in healthy individuals.

Poster #86

Category: Clinical Vignette

School: Western Michigan University School of Medicine

Clerkship Director: Melissa Olken, MD, ACP Member

Presenter: Jasmine Saeedian

Additional Authors: Muhammad Armughan Ali, MBBS; Ricardo Lessa de Castro, MD; Spencer Winters, MD

### **Autoimmune or Infection? ANCA-Negative EGPA Mimicking Pneumonia in A Healthy Young Patient**

Introduction: Eosinophilic Granulomatosis with Polyangiitis (EGPA) is a multisystem disorder characterized by asthma, sinusitis, and rash in the setting of marked peripheral eosinophilia. EGPA is a vasculitis of small- and medium-sized arteries, and it is classically considered one of the three anti-neutrophil cytoplasm antibody (ANCA)-associated vasculitides. Yet, only 30-60% of patients with EGPA have antineutrophil cytoplasmic antibodies.

Case Presentation: A 48-year-old man presented with acutely worsening shortness of breath, full-body rash, and wheezing following two months of mild symptoms. History was significant for recreational use of home-grown marijuana. He was admitted directly to the MICU, where his worsening hypoxemia necessitated emergent intubation. Recurrent fevers along with leukocytosis and eosinophilia on initial lab work prompted autoimmune and infectious disease workup, which was all negative, including ANA and ANCA panels (MPO and PR3). Our patient was started on high-dose steroids, and while initially there was poor response, absolute eosinophil counts sharply declined. Skin biopsy obtained during initial workup finally resulted and showed granulomatous vasculitis with numerous eosinophils, confirming the diagnosis of ANCA-negative EGPA. With improvement and resolution of his condition, he was extubated with plans for outpatient subspecialist follow-up.

Discussion: Because of differing manifestations of ANCA-positive and ANCA-negative EGPA, it is crucial to understand diverse diagnostic methods in order to accurately and efficiently diagnose the disease and provide appropriate medical management. For our patient, a skin biopsy ultimately allowed us to make the final diagnosis of EGPA, in light of his persistent fevers and an otherwise completely negative autoimmune workup. We were tasked with choosing to pursue steroids versus antibiotics. Through the correlation of autoimmune, infectious, hematologic, and histological workup, one can confidently diagnose EGPA with a specificity of 99.7%. By utilizing skin biopsies in unusual presentations of possible autoimmune disease, we can care for patients acutely while preventing sequelae of their unique disease processes.

Poster #87

Category: Research

School: Western Michigan University School of Medicine

Clerkship Director: Melissa Olken, MD, ACP Member

Presenter: Daniel Waters

Additional Authors: Lucas Rich

### **Does Sars-CoV-2 Downregulate the Vitamin D Receptor in Humans?**

**Introduction:** Vitamin D is a validated regulator of the immune system and has been investigated as a therapeutic targeting the dysregulated inflammatory response central to the pathophysiology of the Sars-CoV-2 virus. Population studies suggest a protective effect of higher serum vitamin D levels, while randomized controlled trials have equivocal results. We hypothesize that the Sars-CoV-2 virus downregulates the widely-distributed vitamin D receptor (VDR) with resultant immune dysregulation of several organ systems. Additionally, therapeutic interventions that target the VDR mediated pathway may be efficacious.

**Methods:** We conducted searches of the PubMed database from December 2020-February 2021 including the terms: vitamin D AND immune regulation, VDR regulation and dexamethasone, downregulation VDR AND virus, VDR knockout mice AND vascular, VDR AND furin, vitamin D AND ACE2. From these results, we reviewed approximately 40 papers, mostly review articles of physiology and clinical trials for therapeutic interventions.

**Results:** Various microorganisms, including respiratory viruses, downregulate the VDR as an integral role to slow host immune response and increase virulence. Specifically, downregulation of the VDR leads to imbalances of heat shock proteins (HSPs) and excessive inflammation consistent with cytokine storm and acute respiratory distress syndrome (ARDS). VDR-knock out models demonstrate widespread thrombosis, cardiac reperfusion injury, and neurological damage. Downregulation of hepatic nuclear factor 4-alpha (HNF-4a), a target of the VDR pathway, may increase production of ACE2 and Furin, both required for infection of Sars-CoV-2. Lastly, dexamethasone increases vitamin D effects through increased transcription of the VDR, mechanistically elucidating the mortality benefit.

**Conclusion:** Evidence from the research reviewed shows that multiple other respiratory viruses have been shown to downregulate the VDR and that there are many similarities between a dysfunctional vitamin D pathway and the clinical presentation of COVID-19. Dexamethasone has been shown to increase VDR expression, and more studies on VDR in COVID may be warranted.

Poster #88

Category: Clinical Vignette

School: Western Michigan University School of Medicine

Clerkship Director: Melissa Olken, MD, ACP Member

Presenter: Jessica Ziccarello

Additional Authors: Laura Bauler PhD, Joshua Mastenbrook MD

## **The Importance of Patient Advocacy in Foreign Body Identification and Management: A Case Report**

Introduction: Foreign body ingestion, while not uncommonly seen in psychiatric patients, can present dilemmas for physicians given the challenges of obtaining reliable histories, dependence on static imaging that can only capture an object's location at a given point in time, and a need to balance recommendations from subspecialty consultants.

Case Presentation: A 22-year-old female with a history of multiple foreign body ingestions presented to the Emergency Department with 10/10 left-sided pharyngeal pain after ingesting the stem of her eyeglasses. The patient's physical exam was benign, but radiographs revealed an 8-9 cm linear foreign body in the left proximal esophagus. Gastroenterology performed an emergent esophagogastroduodenoscopy (EGD), but when no foreign body was found, they suggested that the object may have passed naturally and recommended discharge.

When the patient regained consciousness following procedural sedation, she reported continued left-sided pharyngeal pain and was adamant that the object was still present. Using bedside ultrasound, the foreign object was once again located on the left side. Computed tomography revealed that it had penetrated the esophagus and was resting at the confluence of the internal jugular vein and brachiocephalic vein, just anterior to the carotid sheath.

Discussion: In this case, advocacy for the patient, even in the face of more conservative recommendations, was critical in ensuring appropriate final management. Placing emphasis on the patient's account of her foreign body ingestion led to better patient management, as well as built trust between the patient and her providers. While subspecialty recommendations are invaluable, the consulting physician may not have all the information, especially in challenging cases like this. Thus, the clinician who has followed the case from the beginning is in a unique position to advocate for their patient and the interventions they believe will be most beneficial.