

First Orthopedic Surgery Interest Group Clinical Research Showcase at Wayne State University School of Medicine 2019

Keynote Address and Dinner

5:00 pm to 5:30 pm	Dinner Poster Check-in and Hang-up
5:30 pm to 6:00 pm	Keynote Address: Eileen Crawford, MD <i>University of Michigan Health System Department of Orthopaedic Surgery</i>

Podium Research Presentations

6:00 pm to 6:30 pm	<p>Experiences in Biobanking: DMC Hydrocephalus Cohort <i>Jacob Gluski, BS; Paul Zajciw, MS; Prashant Hariharan, MS; Neena Marupudi, MD, MPH; Carolyn Harris, PhD</i></p> <p>Background: Pediatric hydrocephalus is a devastating and costly disease. The mainstay of treatment is surgical shunting of cerebrospinal fluid. These shunts fail at a high rate. The relationship between clinical decision making and shunt failure is poorly understood and multifactorial. Treatment paradigms have changed little since the 1980s. In order to investigate factors that affect outcomes, we have established the Wayne State University shunt biobank. Methods: Children's Hospital of Michigan is one of the participating centers in our biobank, and has enrolled 73 patients from whom we have collected 115 shunt samples and 40 CSF samples. Samples are directly obtained from the OR. CSF samples are kept cold until they can be spun down and put on liquid nitrogen. The shunt samples are fixed in PFA. Clinical data is taken from EMRs and maintained in a REDCap database under coded identifiers. Regression analysis was performed to determine factors affecting number of revisions. Results: Patient age and Medicaid usage were found to be significant predictors of the number revisions, patient weight and the median income of the family's zip code were not significant predictors. The number of revisions also significantly varied by type of shunt system used. Conclusion: Many studies have used median income of a patient's zip code as a stand in for socioeconomic status, our study found medicaid enrollment to be a more significant predictor than income. This variable is commonly available in patient EMRs and merits further investigation for its usage in larger cohorts. Unsurprisingly age was a very significant predictor of the number of shunt failures. The relationship between number of shunt revisions and shunt system type needs further examination to yield prognostic insight, as patients with shunt systems with higher number of failures often start with lower-median number of failure ventriculoperitoneal shunts.</p> <p>Effect of Exercise Intensity on Post-stroke Rehabilitation in Rats <i>Fengwu Li, MS; Xiaokun Geng, MD; Christian Huber; Yuchuan Ding, MD</i></p> <p>Post-stroke physical exercise is known to improve rehabilitation and neuroplasticity. The timing of rehabilitation has been extensively studied but the rehabilitative benefits of varying doses of exercise remain unknown. This study was to investigate whether exercise intensity affects brain injury, functional outcome and neuroplasticity after ischemic stroke. Adult rats were subjected to a middle cerebral artery occlusion and subsequently assigned to either a resting, or one of two exercise groups consisting of mild and intense treadmill training. Exercise was initiated after 24 h of reperfusion. Infarct volume, apoptotic cell death and neurological defects at 3 days were examined. Motor and cognitive function were determined up to day 28. Growth-associated protein 43 (GAP-43), microtubule-associated protein (Tau), postsynaptic density-95 (PSD-95) and synapsin I (SYN) were measured by Western blotting and flow cytometry to determine</p>
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synaptogenesis. The upstream regulatory factors including hypoxia inducible factor-1 α (HIF-1 α), brain-derived neurotrophic factor (BDNF), nerve growth factor (NGF), tyrosine kinase B (TrkB) and cAMP response element binding protein (CREB) were also detected by Western blotting.

Impact of Nutrition on 30-day Readmission Among Patients to the Emergency Department with Acute Heart Failure

Tejeshwar Singh Bawa, BS; Phillip Levy, MD, MPH

In America, heart disease is responsible for one in every four deaths. Heart failure (HF), in particular, is associated with a national health and economic burden that is expected to continually grow. Persons who consume a nutritious diet rich in micronutrients (e.g. vitamins) have lower cardiovascular disease risk and there is considerable interest in how the micronutrient environment might influence cardiovascular disease recovery. While there are many clinical and non-clinical factors that influence patient outcomes, our project will focus on nutrition's role in cardiovascular disease progression. Specifically, this proposal seeks to investigate the relationship between patient nutritional profiles and post-discharge acute heart failure (AHF) cardiac recovery.

A Community Assessments Evaluation in the Dominican Republic during World Health Student Organization (WHSO) Medical Relief Trips

Eric Lisznyai, BS, MS; Aileen Haque, BS; Sarah Ottum, BS; Dhir Patwa, BS; Chih Chuang, MD

Introduction: Throughout the world, many people in developing countries experience severe barriers to healthcare. A community health assessment helps characterize the population's overall health by identifying major risk factors and problems from an individual patient's perspective. Methods: Medical students on WHSO Medical Relief Trips to the Dominican Republic collected data by administering a country-specific community health assessment survey. Teams of medical students interviewed community members using a 28-question survey targeting the health of the community, personal health, water and electricity access, healthcare access, and demographics. Results: This project remains active, with preliminary results from the Dominican Republic trip. Based on patient responses, top healthcare issues include hypertension (41%), viral illness symptoms (38%), and headaches (24%). There are also significant results on healthcare access and general nutrition. Discussion: Based on these results, annual WHSO trips run by medical students can elucidate common health problems and cater both education and medical care to the specific needs of underserved populations. A patient-centered approach helps establish personalized and sustainable healthcare in countries like the Dominican Republic.

6:30 pm to 7:00 pm

Assessing and Reducing Adult Preoperative Anxiety: A Survey of 3,661 Members of the American Society of Anesthesiologists

Arif Musa, MS; Jeffrey C Wang, MD; Frank L Acosta, MD; Rana Movahedi, MD; David Safani, MD, MBA; Christopher Cooke, MD; Syed F Hussain, BS; Jahan Tajran, BS; Shafi Hamid, BS; Gligor Gucev, MD, EdD

Introduction: Preoperative anxiety often goes unaccounted for in the surgical setting. Given that anesthesiologists are routinely involved in perioperative care, this study was performed to assess anesthesiologists' views of adult preoperative anxiety assessment and management. Methods: Active members of the American Society of Anesthesiologists (ASA) were sent an online questionnaire. Survey items included demographic information in addition to questions about measurement of preoperative anxiety, management of anxiety, and which entities were allocated responsibility to reduce patient anxiety. Data were collected from

February to March 2019. Results: Of 3,661 respondents, most asked their patients about preoperative anxiety (n=2332, 64.3%). The following techniques were supported to reduce preoperative anxiety: pharmacotherapy (n=3205, 91.6%), patient education (n=2493, 71.3%), preoperative anesthesiologist visit (n=2095, 59.9%), family members' presence (n=1828, 52.3%), preoperative tours (n=660, 18.9%), nurse-patient empathetic interactions (n=622, 17.8%), traditional, complementary, or alternative medicine (n=243, 7.0%), other techniques (n=219, 6.3%), cognitive behavioral therapy (n=107, 3.1%), or referral to a psychologist/psychiatrist (n=44, 1.3%). Discussion: Most anesthesiologists formally assessed preoperative anxiety and indicated a willingness to discuss anxiety if raised by the patient. Most anesthesiologists preferred to administer anxiety medication to reduce preoperative anxiety, but several other techniques were supported.

Application of Laser technology in the non-surgical management of Periprosthetic Joint Infection (PJI); Novel Insights from Dental peri-implantitis.

Kareem G Elhage, BA; Mohamed Awad, MD; Khaled Saleh, MD, MS, FRCSC, MHCM, CPE

Introduction: The management of periprosthetic joint infection (PJI) is challenging, and its socio-economic impact is significant. Moreover, the incidence of MRSA and other resistant organisms are on the rise. Recently, laser technology has been incorporated into treatment protocols of dental peri-implantitis. This review explores the possibility of using laser technology to manage peri-implantitis. Methods: This article will provide a detailed, comprehensive, and perspective review of the existing evidence of laser technology in management of dental peri-implantitis. Results: Dental literature investigated the efficacy of several types of lasers. It was shown that diode lasers improved periodontal probing depth (PPD) and bleeding on probing (BOP). CO₂ and Nd:YAG lasers have bactericidal and decontaminant functions. Er:YAG and Er,Cr:YSGG lasers seem to have the least heat-related side effects and can be safely used for cleaning of implants in dentistry. Photodynamic therapy is shown to decontaminate 2 types of implants used in PJI. Discussion and Conclusion: A combination of good surgical skills and application of novel technologies will deliver the best outcomes. Our aim is to provide orthopedic surgeons with the effect size and quality analysis of the current evidence behind different laser techniques to decontaminate the implant surface and preserve the surrounding tissue.

Establishing Normative PROMIS UE Scores

Charles Day, MD, MBA; Nikhil Yedulla, BS; Cade Cantu

Patient-Reported Outcomes Measurement System (PROMIS) is a metric that assesses patient responses to treatments in a variety of health domains. PROMIS metrics are standardized so that a score of 50 signifies the average for a reference population, and comparison to this reference score enables outcomes assessment following procedures. Despite these general population reference scores, there are no reference scores for asymptomatic patients. As a result, PROMIS scores are not compared to a healthy reference population but rather to the health of average Americans. It is thus imperative to calibrate normative PROMIS scores across healthy patient populations to enable better standards of comparison. Such normative PROMIS scores are especially relevant to upper extremity patients. Upper extremity injuries account for 18 million emergency room visits annually, and accurate reference PROMIS scores enable improved management of this significant patient demographic. This study aims to assess PROMIS Upper Extremity (UE) scores in healthy individuals without generalized upper extremity pain. Additionally, a secondary aim is to determine changes in these reference scores with age across decade-long intervals. We hypothesize that PROMIS UE

scores for asymptomatic young adults exceed the general population reference score of 50, but are lower than this value for older asymptomatic individuals.

ACL Reconstruction Outcomes Following an Abbreviated Rehabilitation Protocol

Martin J Weaver, BS; Henry T Goitz, MD; Nick Bolz, MD; Brett Chamernik MD; Muhammad T Padela, MS, MD; Vincent Bruno BS

Anterior cruciate ligament (ACL) reconstruction is one of the most commonly performed orthopedic surgical procedures affecting at least 200,000 patients in the United States yearly. Reconstruction is generally performed on younger individuals who are athletes and are eager to return to sport. Many factors influence rehabilitation time and procedural outcomes, including graft selection, graft fixation technique, and rehabilitation staging and protocol. Accelerated return to sport and activity is a particularly coveted result from ACL reconstruction; however, many surgeons feel early stressing of ACL grafts increase failure rates and put off aggressive rehabilitation for up to 6 weeks. This study seeks to demonstrate patients who undergo an abbreviated rehabilitation protocol after Patellar bone tendon bone autograft and are able to attain full knee flexion, extension, symmetric patellar mobility, and symmetric strength on physical examination are able to return to sport earlier without increased risk of re-rupture without delaying weightbearing or aggressive rehabilitation.

Return to Play Within 90 Days of Concussion is Associated with Increased Odds of Lower Extremity Musculoskeletal Injury among National Basketball Association Players

Toufic Jildeh, MD; Jacob Young, BS; Brendan Page, BS; Fabien Meta, MD; Kelechi R Okoroha, MD; Vasilios Moutzourous, MD

Vault perforation after eccentric glenoid reaming for deformity correction in anatomic total shoulder arthroplasty

Adam M Olszewski, BS; Austin J Ramme, MD, PhD*; Tristan Maerz, PhD; Michael T Freehill, MD; John JP Warner, MD; Asheesh Bedi, MD (* denotes co-first authors)*

7:00 pm to 7:30pm

Background: The management of glenoid deformity during anatomic total shoulder arthroplasty remains controversial. In this study, we evaluate variable correction of glenoid deformity by eccentric reaming. We hypothesize that partial correction can achieve 75% bone-implant contact area (BICA) with a reduced vault perforation risk compared to complete correction. Methods: Fifty shoulder CT scans with glenohumeral osteoarthritis were retrospectively evaluated. The Tornier BluePrint™ v2.1.5 software simulated three eccentric reaming scenarios including no, partial, and complete deformity correction. Each scenario evaluated medialization and vault perforation of three implant fixation types at four BICAs. Results: The mean glenoid retroversion and inclination was 18.5° and 8.8° and mean posterior humeral head subluxation was 76%. With 75% BICA, the three fixation types had glenoid vault perforation in 6-26% and 26-54% of cases for partial and complete correction, respectively. The central and posterior-inferior implant components were most likely to perforate across all scenarios. Discussion: Eccentric reaming for glenoid deformity correction increases the risk of vault perforation. Pegged implants have increased chances of perforation compared to a keeled design; the central and posterior-inferior components were most likely to perforate. Conclusion: Partial correction of glenoid deformities can achieve 75% BICA, while reducing the risk of vault perforation compared to complete correction.

Irreducible Dislocations at the Interphalangeal Joint of the Thumb: A Systematic Review and Case Report

Daniel Hanlin Chen, MS; Jerette Schultz, MD; Maggie Iwanicki, MD

This article seeks to synthesize the existing body of knowledge with regard to open irreducible dislocations specific to the IP joint of the thumb. We aim to quantify this injury subtype by its various etiologies, presentations, findings, treatment methodologies, and clinical outcomes whilst simultaneously adding to the body of literature with a case report from our institution.

Factors Contributing to Out-of-Hospital Cardiac Arrest Mortality Trends in the City of Detroit (2014-2018)

Adam D Chalek; Shobi Matthew; James H Paxton; Brian Reed, Joseph B Miller; Howard Klausner; Robert Dunn; Brian O'Neil

Introduction: Survival with good neurologic outcome (GNO) following out-of-hospital cardiac arrest (OHCA) requires intensive post-ROSC care. In response to a recent decline in OHCA survival rates in Detroit, we conducted an analysis to identify factors contributing to this regression. Methods: 5,175 adult OHCA patients from Cardiac Arrest Registry to Enhance Survival (CARES) data were analyzed. Patient demographics, arrest conditions, and post-ROSC interventions including left heart catheterization (LHC) and targeted temperature management (TTM) were correlated to survival to hospital discharge and discharge with cerebral performance category (CPC) scores of 1 or 2. Results: Overall, we observed a decrease in LHC and increase in TTM rate. LHC rate correlated best with survival to hospital discharge. In 2018, a decrease in survival to hospital discharge occurred, though the percentage of patients discharged with GNO was similar. Also, in 2018, an increase in the proportion of patients with GNO receiving LHC occurred despite an overall decline in LHC rate. Discussion: Our results suggest LHC remains vital to OHCA survival and neurologic outcome. However, further exploration is required to elucidate the differences in LHC treatment contributing to increased therapeutic outcomes.

Assessment of Sarcopenia and Obesity by Bioelectrical Impedance Analysis in Transplant and Hepatobiliary Populations

Jonathan Konel, MHS; Toshihiro Kitajima, MD, PhD; Luisa Arevalo, BS; Nicole Murray, MPH; Thomas Pietrowsky, RD; Deepak Venkat, MD; Humberto Gonzalez, MD; Millie Samaniego, MD; Marwan Abouljoud, MD; Shunji Nagai, MD, PhD

Sarcopenia and obesity are common among transplant and hepatobiliary patients; however, current methods of measuring these risk factors may provide an inadequate representation of their impact on adverse outcomes. Bioelectrical impedance analysis (BIA) is an emerging tool that can quickly measure body composition to assess obesity and sarcopenia. This study aimed to assess clinical utility of BIA in transplant and hepatobiliary populations. Methods: We conducted a single-center study of 60 patients (5 living donor candidates, 10 early post-operative, 7 benign liver disease, 14 chronic kidney disease, 5 early cirrhosis, 7 post-transplant, 6 early malignancy, and 6 advanced malignancy). Sarcopenia was defined as patients with a calculated whole-body muscle mass (kg)/body surface area below the 25th percentile. Obesity was defined as fat percentage of >25% and >30% in males and females, respectively. Patients were categorized into 4 groups: (1) not sarcopenic/not obese, (2) sarcopenic/not obese, (3) not sarcopenic/obese, and (4) sarcopenic/obese. Clinical characteristics and BIA were compared. Results: The 60 participants were grouped as: 28 not sarcopenic/not obese, 1 sarcopenic/not obese, 17 not sarcopenic/obese, and 14 sarcopenic/obese. There was no significant differences in BMI, albumin, total protein, and absolute lymphocyte count. Sarcopenic/obese patients showed significantly lower Karnofsky score (median 55% [IQR, 50-82.5%]), compared to not sarcopenic/obese patients (median 80% [IQR, 60-92.5%]) (P =0.037). All patients with advanced malignancy were either sarcopenic/not obese or sarcopenic/obese. Conclusion: Patients who were sarcopenic/obese showed significantly lower performance status than patients who were not

sarcopenic/obese. BIA may serve as a useful tool in assessing sarcopenia and obesity to identify patients who are at risk of muscle wasting and frailty.

Hand Injury Visit Preference: Virtual or In-person

Charles Day, MD, MBA; Nikhil Yedulla, BS; Brooke Garnica, BS

Virtual care has emerged as an innovative medium for conducting appointments with patients. The widespread access to online technology has enabled this new forum for patient-physician communication to emerge. It is thus important to understand the perspectives of key stakeholders, particularly patients, regarding virtual care. There has been an initial investigation into the viability of the virtual clinic model for upper extremity conditions. A 2018 study by Evans and group involved upper extremity trauma patients receiving virtual consultations, with 51 of the 60 participants describing themselves as “very satisfied” and the other 9 as “satisfied”. These findings provide a preliminary basis into understanding the effectiveness of virtual care in upper extremity clinic settings, yet further investigation is merited to develop a better understanding. Additionally, the correlation between preference for and satisfaction with a virtual or traditional visit has yet to be examined. The objective of this study is two-fold: to assess overall patient satisfaction levels with virtual care and also changes in patient preference for virtual care from pre- to post- appointments. We hypothesize that patients will exhibit increased satisfaction with virtual care in comparison to traditional care and that there will be increased preference for virtual care appointments post-visit.

7:30pm to 8:00 pm

Co-Inheritance of Autosomal Dominant Polycystic Kidney Disease and Beta-Thalassemia Minor: A Case Report

Sawsan Edriss, BS; Cardell Louis, BSMA; Michael Yacoub, MD

Autosomal dominant polycystic kidney disease (ADPKD) has shown to be associated with hemoglobinopathies. Hemoglobin C and S, commonly inherited hemoglobin disorders, have an increased risk of ADPKD. Alpha-thalassemia has been shown to be inherited with ADPKD. We present a Caucasian female with ADPKD that tested negative for HgC and HgS mutations who was found to have beta-thalassemia minor. We present a 48-year-old Caucasian female with a PMH of beta-thalassemia minor admitted for a month of abnormal uterine bleeding, secondary to fibroids; continued blood loss led to acute kidney injury. Retroperitoneal ultrasound showed multiple cysts of various sizes throughout both kidneys with left renal enlargement consistent with ADPKD. Her anemia showed a concurrent iron deficiency as well as thalassemia. ADPKD is generally diagnosed clinically based on patient age, family history and ultrasound imaging demonstrating numerous types of renal cysts of varying sizes. Beta-thalassemia minor tends to be asymptomatic with a mild anemia with marked microcytosis. This case demonstrates a genetic co-inheritance between ADPKD and Beta-thalassemia minor. Further evaluation of the patient will be necessary to determine any existing connection between the two diseases. We suggest providers consider performing a hemoglobin electrophoresis in patients with diagnosed ADPKD and unexplained microcytic anemia.

Rare Histological Variants of Prostate Adenocarcinoma: A National Cancer Database Analysis

Chandler Bronkema, BS; Sohrab Arora, MD, MS, MCh; Akshay Sood, MD; Deepansh Dalela, MD; Jacob Keeley, MS; Alex Borchert, MD; Lee Baumgarten, MD; Craig G Rogers, MD; James Peabody, MD; Mani Menon, MD; Firas Abdollah, MD

INTRODUCTION: Our aim was to describe the contemporary presentation and overall survival (OS) of the rare variants of prostate adenocarcinoma (PCa).

METHODS: We examined a total of 1345561 patients who were diagnosed with PCa, between 2004 and 2015, within the National Cancer Database (NCDB). We focused on the following variants: mucinous, ductal, signet ring cell (SRC),

adenosquamous (ASC), and neuroendocrine (NEC). Characteristics at presentation for each variant were compared with nonvariant PCa. Cox regression was used to study the effect of histological variant on overall mortality.

RESULTS: Few (5062/1345561; 0.38%) patients presented with rare-variant PCa. All variants had a higher clinical T stage at presentation than nonvariant PCa (all $p < 0.001$). Metastatic disease was most common with NEC (62.9%), followed by ASC (31.1%), SRC (10.3%), and ductal (9.8%) variants, compared to 4.2% in nonvariant PCa (all $p < 0.001$). Metastatic disease in mucinous (3.3%) was similar to nonvariant PCa ($p = 0.2$). Estimated OS at 10 years was highest in the mucinous variant (78.0%), followed by nonvariant (71.1%), SRC (56.8%), ductal (56.3%), ASC (20.5%), and NEC PCa (9.1%). At multivariable analysis, mortality was significantly higher in ductal (hazard ratio [HR]: 1.38; $p < 0.001$), SRC (HR: 1.53; $p < 0.01$), NEC (HR: 5.72; $p < 0.001$), and ASC (HR: 9.34; $p < 0.001$) variants, as compared to nonvariant PCa. **CONCLUSIONS:** There are differences in the clinical presentation and OS among rare variants of PCa. NEC, ASC, SRC, and ductal variants more commonly present with metastatic disease. All variants present with a higher local stage than nonvariant PCa. The NEC variant is associated with the worst, and mucinous variant with the best OS.

Case Report: Budd-Chiari Syndrome Leading to Cirrhosis in a Young Woman

Hailey Olds, BS; Andrew Failla, MD; Diana Alaouie, BS; Abid Ahmad, BS

A young woman with a past medical history of hepatic steatosis and polycystic ovarian syndrome controlled with oral contraceptive pills presents for ascites and diffuse hepatocellular disease of unknown etiology. The patient initially presented to an outside hospital for right upper quadrant pain, nausea, and vomiting. This was attributed to a gallbladder abnormality, and a laparoscopic cholecystectomy was performed. During the procedure, the liver appeared cirrhotic and ascitic fluid was present. A CT scan showed diffuse hepatocellular disease with mesenteric lymphadenopathy. After many tests, no clear etiology for her profound liver disease was determined, and she was transferred to another institution for escalation of care. Here, she was found to have Budd-Chiari syndrome and bilateral lower lobe pulmonary embolisms. Her oral contraceptives were discontinued, anticoagulation was started, and a DIPS procedure was performed to relieve portal hypertension. In young patients with rapidly progressing liver disease, Budd-Chiari syndrome is a rare but important diagnosis to consider, especially in those with hypercoagulable risk factors. In primary Budd-Chiari syndrome, a thrombus forms in the hepatic veins, preventing blood from exiting the liver. Treatment involves addressing the underlying cause, starting anticoagulation, and treating portal hypertension if present.

Effects of obesity on fluid resuscitation in pediatric burns

Jan Stevens, BS; Nina Prieto, BS; Erika Riddelman, PhD; Christina Shanti, MD

The effects of obesity on appropriate fluid resuscitation for hypovolemia in pediatric burn injuries are poorly understood. Studies have shown that resuscitation formulas using body surface area or body weight overestimate fluid needs and increase the risk of complications (i.e. pulmonary edema) in obese adults. However, no such studies have been performed in pediatric populations, wherein body surface area to mass ratios are proportionally increased compared to adults. In this study, we perform a retrospective analysis of resuscitation data in patients ≤ 18 years of age with $\geq 15\%$ total body surface area burn injuries between 2009 and 2019 ($n=144$). Patients were classified as underweight (< 5 th percentile),

normal weight (5th to 85th percentile), overweight (85th to 95th percentile), or obese (>95th percentile) according to CDC growth charts. Total fluid administration was calculated by adding up all fluids administered IV (i.e. Lactated Ringer's) and orally (i.e. infant formula) within the first 24 hours after the time of injury. These values were then compared to predicted fluid needs according to the commonly-used Parkland, Galveston, and Cincinnati formulas. Additional data on resuscitation complications (i.e. ARDS), vitals, and urinary output were collected over the first 24 hours after injury to measure the effectiveness of treatment.

A Machine Learning Approach to Optimize Specificity of Troponin Interpretation in the ED

Farhan Chaudhry, MS; Kipp Johnson BS; Craig Tschautscher, MD; Fayzan F Chaudhry, BS; Brandon L Foster, BS; Nikki Taylor, BS; Isaac Y Kim, BS; Katanya C Alaga, BS; Lydia Ross, BS; Jake Wilson, BS; Eric M Blake, BS; Allie J Brodsky, BS; Ellen E Kjoller, BS; Noreen F Rossi, MD; Phillip D Levy, MD, MPH; Vijaya A Kumar, MD

Poster Research Presentations

6:00 pm to 8:00 pm

Evaluation of Gastroesophageal Reflux Disease as a Chief Complaint at a Rural Haitian Clinic

Aileen Haque, BS; Eric Lisznyai, BS, MS; Sarah Ottum, BS; Marcus Zervos, MD

Introduction: Gastroesophageal reflux disease (GERD) is a burden on individuals in developing countries. There is little information on the management of GERD in a low-income country settings. It is suspected that most patients lack adequate knowledge of prevention and treatment of GERD symptoms. Methods: Teams from Wayne State traveled to Morne L' Hopital, Haiti twice a year to operate clinics from 2015-2017. A retrospective analysis of EMR charts reviewed for chief complaints with symptoms of GERD were compared with subsequent diagnoses and treatments. Diagnoses were determined by clinical presentation, history, and exam. Results: Of the 186 adult patients clinically diagnosed with GERD, a total of 112 presented with a chief complaint of at least one GERD symptom (60.22%) and were subsequently treated. Treatments consisted of lifestyle counseling and medications (antacids, H2 blockers, proton pump inhibitors). Conclusions: Based on these results, a notable number of patients presenting to this clinic had symptoms of GERD and little knowledge on treatment. Therefore, developing treatment plans that focus on early prevention and proper medication use would significantly improve quality of life. Education plans should focus on lifestyle changes and medication adherence to decrease recurrence and prevent conditions that preclude GERD (esophagitis, Barrett's, strictures, cancer).

Patient Appointment Compliance at Kresge Eye Institute

Alisha Khambati, BS; Lauren Dowell, MS; Jayashree Ravi, MS; Ashok Kumar, PhD

Appointment compliance (AC) is an obstacle to the physician-patient relationship, and thus, to patient care. This investigation describes AC at Kresge Eye Institute (KEI). Retrospective analysis was performed across all appointments scheduled from 01/2014 to 12/31/2018 at any of KEI's 23 out-patient Michigan locations. Patient arrival to appointment was classified as compliant (CO) and patient cancellation/no-show was classified as non-compliant (NC). Categorical and binary

characteristics (patient gender and race; physician specialty) was compared across CO and NC groups via Chi-Square analysis. Continuous characteristics (patient age and driving distance as calculated from zip code) was compared via Mann-Whitney U analysis. A total of 835,207 appointments across 13 ophthalmic specialties were included with 60.3% CO and 60.5% female gender. The following characteristics had significant differences across CO and NC patients: patient gender ($p<0.0001$); race (10 categories; ($p<0.0001$)); median age at appointment (CO=58 yrs; NC=62 yrs; ($p<0.0001$)). Also, AC had significant differences in ophthalmic specialty ($p<0.0001$) and driving distance ($p<0.0001$). The driving distance of CO (range: 0.3-578 miles) and NC (range: 0.3-476 miles) groups had the same median at 20 miles.

Psychosocial Effects of Kids Kicking Cancer

Aneesh Hehr, BS; Allesandra S Iadipaolo, BA; Cindy Cohen, MS, CCLS; Craig Peters, BS; Autumn Heeter; Shelley Paulisin; Kristopher Dulay; Rebecca Cramer, CCLS; Austin Morales, BS; Breanna Borg, BS; Jamila Carrington Smith; Marc Cohen; Peter Davenport; Michael Hunt; Richard Plowden; Naomi Kosofsky, LLMSW; Martin H Bluth, MD, PhD; Elimelech Goldberg, BA, DD; Jeffrey W Taub, MD; Felicity W Harper, PhD; Christine A Rabinak, PhD; Hilary A Marusak, PhD

Purpose. Kids Kicking Cancer (KKC) is an international organization that provides martial arts-based meditative therapy to help children with cancer cope with adverse psychosocial effects. This pilot study tested agreeableness and effects of a brief KKC intervention on resilience, mindfulness, quality of life, pain, and posttraumatic stress symptoms (PTSS) in youth with cancer. **Methods.** Nineteen youth with cancer (5-17 yrs, 8F) completed 4 KKC classes, following a standardized format. Parents and youth completed standardized questionnaires before and after the intervention. **Results.** 100% of parents reported that they were satisfied with and would recommend KKC to other families. A majority reported a positive change in their child, e.g., better ability to regulate emotions (77%) and pain (69%), and better ability to handle medical procedures (62%). Questionnaire data showed a significant reduction in hyperarousal PTSS over the course of the intervention ($p=0.01$). There was also an increase in resilience, quality of life, mindfulness, and a reduction in pain interference during the intervention, but these effects did not reach significance. **Conclusion.** Results of this pilot study indicate that KKC is highly agreeable and may improve psychosocial outcomes among youth with cancer. Although promising, further research is needed (e.g., control group, larger sample).

Variability of PROMISE Use Across Hand Conditions

Charles Day, MD, MBA; Zachary Montgomery, BS; Brooke Garnica, BS; Arvind Balasundaram, MS; Eric Battista BS; Nikhil Yedulla, BS

Patient-reported outcomes are an increasingly important part of evaluating and improving medical care. The Patient-Reported Outcome Measurement Information System (PROMIS) contains multiple question domains that are designed to establish standardized PRO measures across specialties and for a variety of health conditions. The PROMIS domains have become increasingly popular in orthopedic hand surgery because they utilize item response theory and computer adaptive testing to decrease survey length. There has been research establishing PROMIS Physical Function (PF) and Pain Interference (PI) baseline scores for multiple non-traumatic hand conditions. These studies specifically excluded the PROMIS Upper Extremity (UE) domain in their baseline assessments because of a ceiling effect which may limit the questionnaire's ability to measure outcomes. Later studies have found PROMIS UE has the strongest correlation with hand legacy PRO surveys among PROMIS domains, and PROMIS UE demonstrates a greater response to treatment. Furthermore, with the release of PROMIS UE 2.0, studies have shown that the ceiling effect has been improved. The objectives of this study are to demonstrate the baseline score variations of PROMIS UE for patients presenting

with specific non-traumatic hand conditions and to compare PROMIS UE scores to the previously studied PROMIS PI and PF.

Increasing Diversity in Cardiology: A Fellowship Director's Perspective

Arif Musa, MS; Amman Bhasin, BS; Azar Razikeen, BS; Louis Massoud, BS; Arshia Noori, MD; Ali Ghandour, BS; David Gelovani, BS; Ajay S Vaidya, MD

Background: Under-represented minority (URM) physicians, specifically African American, Asian (Filipino, Hmong, Vietnamese), Native American, Hispanic, and/or Pacific Islander, constitute only about 10% of practicing cardiologists. Diversity in cardiology is essential to serve a growing number of minority patients, starting with recruitment within cardiology programs. The goal of this survey is to ask current cardiology fellowship program directors regarding their views of diversity and recruitment of URMs. Methods: A questionnaire was developed to assess program characteristics, importance of diversity, URM presence, methods and responsibility to increase diversity among U.S. accredited cardiology fellowship programs. Cardiology programs were grouped based on region (Coastal, Midwest, or South), category (community, university, or hybrid), location (rural, suburban, urban), fellowship years, fellow positions, and URM percentage. The survey will be sent to cardiology program directors listed on the FREIDA AMA Residency & Fellowship Database. Results: Program regions, categories, and locations will be analyzed based on URM presence and importance allocated to diversity. We will describe which methods were most endorsed by cardiology program directors to increase diversity and which were being actively implemented to increase in the number of URMs and compare with chi-squared tests. Conclusion: This study may identify methods to increase URM diversity in cardiology fellowships that offer insight to medical students and resident physicians considering cardiology fellowships. These findings may also inform cardiology program directors of which methods are most supported by their peers and which additional initiatives may be implemented.

Intravenous Lidocaine for Analgesia in Spine Surgery: A Meta-Analysis of Randomized Controlled Trials

Arif Musa, MS; Aryan Haratian, BS; Ryan Field, MD; Saif Farhan, MD; Collin Bennett, BS; Christopher Cooke, MD; Rakesh D Patel, MD; Ilyas S Aleem, MD, MS; Martin C Eichler, MD; Carlin Lee, BS; S Samuel Bederman, MD, PhD

Views of Emergency Physicians, Nurses, and Patients Regarding Emergency Department Overcrowding in the Urban Setting: A Protocol for a Cross-Sectional Study

Danielle Rangel Paradela, BS; Elizabeth Warbasse, BA; Emily Lau, BS; Arif Musa, MS; Trifun Dimitrijević, MD; Farhan Chaudhry, MS; Sarkis Kouyoumjian, MD

Overcrowding of urban emergency departments has become a systemic problem in the United States and has been linked to increased patient mortality and morbidity. There remains considerable debate regarding how best to reduce overcrowding. Currently the views of attending physicians, emergency nurses, and patients remain largely unknown. In this study, a survey based on a recent 2008 systematic review of causes, effects, and solutions related to overcrowding will be disseminated to emergency physicians, nurses, and patients at Detroit Receiving Hospital and Sinai Grace Hospital in Detroit, Michigan. Standard statistical methods will be applied, and the responses will be compared between groups. Given that attempts to reduce overcrowding likely require the collaboration of providers and patients alike, we hope to identify discrepancies between the views of the aforementioned groups that may contribute to overcrowding and produce barriers to cooperation. We also hope to identify which methods are most likely to receive the support of emergency physicians, emergency nurses, and public alike if implemented.

Mechanical Thrombectomy For Acute Large Vessel Strokes With Low ASPECT (0-5): A Meta-Analysis

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Large vessel occlusions (LVO) with small core infarctions treated with thrombectomy have been extensively studied with numerous randomized studies revealing a functional and mortality benefit over medical management. The benefit of mechanical thrombectomy for LVO in the setting of large core infarction with ASPECT score 0-5 remains to be completely elucidated. We conducted a systematic review and meta-analysis to investigate clinical outcomes with or without successful recanalization for LVO with ASPECTS \leq 5. Safety and efficacy of mechanical thrombectomy vs standard medical care was analyzed in low ASPECT score LVO. Recanalization was defined as TIC1 2b/3 or modified TIC1 2b/3. Successful recanalization was associated with greater rates of functional independence (OR 7.56; 95% CI 2.05-27.81) and lower risk of mortality (OR 0.36; 95% CI 0.22-0.61) in patients with initial ASPECTS \leq 5. Mechanical thrombectomy was associated with higher rates of favorable outcome and lower risk of mortality when compared to medical therapy alone (OR 5.73, 95% CI 2.38-13.78 and OR 0.39, 95% CI 0.22-0.70, respectively). There was no difference in rates of symptomatic ICH.

Using Time-Driven Activity-Based Costing to Determine Surgical Cost of Care for Anterior Cruciate Ligament Reconstruction: A Comparison with Traditional Accounting Methods

Dylan Koolmees BS; Prem Ramkumar MD MBA; Luke Hessburg, BS; Eric Guo, BS; David N Bernstein, MBA, MA; Eric Makhni, MD, MBA

Background: As the financial burden of healthcare continues to rise in the United States, efforts are being made to transition to value-based health care. Health care value is defined as health outcomes achieved per dollar spent over the entire care cycle. However, identifying cost of care (denominator of the value equation) can be challenging due to numerous factors. One main factor involves limitations of accurate cost calculation using traditional cost accounting techniques. The purpose of this study was to determine the cost of care of one of the most common sports medicine surgeries - anterior cruciate ligament reconstruction (ACLR) – using new Time-Driven Activity-Based Costing (TDABC) in comparison to traditional activity-based cost (ABC) accounting models. Our secondary purpose was to identify the main drivers of cost of ACLR in both of these techniques. We hypothesize that indirect costs would be disproportionately weighted in the traditional ABC method resulting in higher reported costs overall. Methods: A process map of ACLR was constructed through direct observation in the clinical setting according to established techniques in order to identify drivers of fixed, direct variable, and indirect costs. The episode consisted of each individual step in the surgical process, from admission to discharge. Personnel costs were calculated from publicly available salary data to determine cost per minute rates and subsequently combined with the process map to determine the overall utilization and costs. The cost generated from the TDABC method was compared with the institution's internal accounting system, which was an Activity Based Costing (ABC) method. Results: The attending orthopedic surgeon was one of the providers with the most direct patient care time throughout the ACLR episode of care at a mean of 156 minutes (Table 3). The total cost of ACLR when using TDABC was \$5,242.25 compared to \$10,318 using the traditional ABC method. The largest difference between the two methods was the domain of direct variable costs. Conclusion: When compared to TDABC, the hospital's traditional cost accounting estimate for ACLR is nearly twice as costly. These findings highlight the variability of cost

calculation for the same clinical episode between the two accounting methods. Direct personnel costs were the main drivers of cost throughout the care episode.

Determining Baseline Pitching Kinematics, Along with Intra- and Inter-Pitcher Variability, of a Novel Wearable Technology Device

Grace Smith, BS; Vincent Lizzio, MD; Dylan Koolmees, BS; Eric Guo, BS; Eric Makhni, MD, MBA

Background: With the introduction of new wearable technology, it is now more feasible to measure medial elbow torque and other quantitative pitching variables in baseball pitchers. An established baseline of biomechanical characteristics, as well as an understanding of the inter and intra-player variability of the device, would allow for players to compare their own measurements against a similar population and aid in injury risk assessment. **Purpose:** The purpose of this study was (1) to determine the normative values of elbow stress, arm slot, arm speed, and shoulder rotation for skeletally immature (15 years and under) and mature (16 years and over) baseball players, and (2) to examine inter and intra-pitcher variability of medial elbow torque as assessed by the wearable device. **Methods:** Pitchers were recruited from local area youth, high school, and collegiate teams and grouped as skeletally immature (ages 15 and younger) or skeletally mature (ages 16 and over). Players threw five fastball pitches while fitted with a wearable device that recorded elbow torque (Nm), arm slot (degrees), arm speed (RPM), and shoulder rotation (degrees). Ball velocity (MPH) was recorded with a radar gun. Inter-player variability was defined as the variation of a pitching parameter among all pitchers within each group. Intra-player variability was defined as the variation of a pitching parameter for each player's five pitches and represents the variability in fastball throwing mechanics for individual pitchers within each group. Both inter-player variabilities and intra-player variabilities are presented in terms of standard deviations. **Results:** One-hundred thirty-eight pitchers participated in this study, of which 73 were skeletally immature pitchers and 65 were skeletally mature. The average elbow torque was significantly lower for the skeletally immature group when compared to the skeletally mature group (39.0 Nm vs. 45.7 Nm, $p < 0.001$). There was no significant difference in the inter-player variability for elbow torque between the skeletally immature and mature groups (9.7 nM vs. 9.4 nM, $p = 0.56$), nor was there any difference in intra-player variability between the two groups (2.9 nM vs. 3.1 nM; $p = 0.61$). The skeletally immature group demonstrated less intra-player variability than the skeletally mature group for arm slot (4.7 deg vs. 6.8 deg, $p < 0.011$); otherwise, there were no differences in the intra-player variability for the other biomechanical parameters. **Conclusion:** There is a significant increase in ball velocity, elbow torque, and arm speed as players become skeletally mature. The device is very consistent within a single player for all pitch parameters; therefore, pitchers can reliably compare their pitching mechanics against established normative curves for their age group, and may also act as their own internal control to assess for changes in throwing mechanics over the course of a season.

E-Cigarette or Vaping Product Use Associated Lung Injury (EVALI) in a Young, Infrequent Vape User

Elizabeth Warbasse, BA; Hafsa Parpia, MD; Andrew Robitaille, DPM; Mohammed Al-Shihabi, MD

A young woman in her twenties presented to the emergency department with complaints of shortness of breath, chest pain, and a "heart racing" sensation for five days, after two visits to an urgent care and one prior ED visit. She was treated with azithromycin and methylprednisolone for suspected bronchitis at the urgent care. She returned to the ED following a finding of tachycardia and the persistence of her shortness of breath. Her CXR was concerning for possible pneumonia, and chest CT was significant for a finding of bilateral ground glass opacities. Upon further history, patient was found to have recently vaped THC-containing e-

cigarette cartridges, although she did not identify as a vape user. The patient's findings of ground glass opacities on chest CT, absence of infection on initial workup as shown by negative respiratory viral panel, negative influenza PCR, negative blood culture, non-reactive HIV test, negative Streptococcus pneumoniae and Legionella urine antigens, and lack of "plausible" alternative diagnoses designate her case as confirmed EVALI (e-cigarette or vaping product use associated lung injury) according to the recently released CDC surveillance case definition. To date, there have been 1,888 reported cases of EVALI in the United States, including 37 deaths.

An Expense Analysis of Traditional Carpal Tunnel Release Versus Wide-Awake Local-Anesthesia No Tourniquet Methods Using Time-Driven Activity Based Costing

Charles Day, MD, MBA; Dylan Koolmees, BS; Eric Battista, BS; Arvind Balasundaram, BS

The costs associated with healthcare in the United States continue to be a concern for patients and healthcare systems [1]. An area of medicine that presents opportunity to reduce costs is orthopedic hand surgery. Outside of the United States, other countries have implemented a new method called Wide-Awake Local Anesthesia No Tourniquet (WALANT), which may provide a financial benefit in the United States [2,3]. In addition to new surgical procedures to reduce the cost of procedures, novel methods of cost accounting, such as Time-Driven Activity Based Costing (TDABC), continue to show promise in determining accurate costs in the field of orthopedic surgery [4-6]. In particular, this method could lower the cost of surgery for one of the most common hand entrapment neuropathies: the carpal tunnel release [7]. The purpose of this study is to compare the expenses and specific cost drivers of traditional carpal tunnel release versus carpal tunnel release with the WALANT method using the TDABC method. We hypothesize that the WALANT method for carpal tunnel release surgery will display reduced costs, when compared with the traditional approach.

Peer-Led Model for Falls Prevention for Community-Dwelling Older Adults

Gabrielle McGrath, BS; Sophia Neuenfeldt, BS; Aubrey Neal; Jennifer Mendez, PhD

Introduction: Studies show that seniors are generally not interested or motivated to receive falls prevention information as they often underestimate their risk of falling, or tend to seek information only after experiencing falls. Other studies show seniors have low levels of knowledge about falls and falls prevention. Therefore, providing education that raises knowledge and motivation is an important initial step to facilitate subsequent engagement in falls prevention strategies. Key stakeholders' perspectives and theoretical frameworks were incorporated in the design of this novel falls prevention education program for community-dwelling seniors, using a peer-led approach. Methods: The program was developed and implemented by medical and art therapy students. Using relevant adult learning principles and health behavior change theories, a presentation and resources for the peer educators were created. A follow-up one-hour session was held to determine if the peer-led approach on falls prevention was being delivered by the newly trained peer educators. Results: This pilot research has demonstrated that an evidence-based peer-led model informed by sound theoretical frameworks can be a feasible initial step towards addressing community-based seniors' perceptions regarding falls prevention. The primary mechanism was tailoring and personalizing the information delivered, in order to foster the seniors' perception of personal relevance of falls prevention.

Stratification of Patients with Inflammatory Bowel Diseases at High Risk of Emergency Room Utilization

Georgiana Marusca; Faiza Bhatti, MD

Patients with a diagnosis of Inflammatory bowel diseases are prone to have multiple Emergency Room (ER) visits due to uncontrolled disease. In the current clinical research study, patients with Inflammatory bowel diseases were seen in the Gastroenterology clinic on a regular basis. Treatment for these diseases is becoming more and more specialized, and treatment adequacy is assessed with each clinic visit. By identifying and analyzing the risk factors contributing to ER visits and hospital admission in patients with inflammatory bowel diseases, we would like to improve treatment plans, decrease the number of ER visits, and reduce healthcare costs.

Medical Student Perspectives on Opioid Use Disorders: An Innovative MAT Waiver Training Integration During IM Clerkships

Michael Garmo; Rafael Ramos; Katherine Palmer Loveluck; Kaycee Ching; Irvin Lien; Jody Chou; Aaron Szytman; Eva Waineo, MD; Diane Levine, MD

The opioid epidemic in the US has become a major issue in healthcare. In 2017, there was an estimated 72,306 drug overdose related deaths and the Emergency Departments (ED) nationally saw a 30% increase in opioid related overdoses. Most primary care physicians self-report they lack the skills to identify and appropriately treat substance use disorders (SUDs), currently only 35,604 of the approximate 800,000 US physicians (<3%) are registered to prescribe buprenorphine. Studies have suggested that the best solution is to improve medical school curricula, therefore we implemented an innovative approach to provide students with the skills to understand how to prescribe buprenorphine and build confidence to medically manage opioid use disorders in the future. After encouraging responses from first and second year students, it was decided to incorporate the 8-hour Medication Assisted Treatment (MAT) training into the internal medicine clerkship in third year. By completing the training, students are increasing their knowledge of treatment of SUDs and will be eligible for a their MAT waiver upon obtaining their permanent license.

Artificial Hibernation By Phenothiazines: A Potential Neuroprotective Therapy Against Cerebral Inflammation in Stroke

Longfei Guan; Sichao Guo; James Yip; Kenneth B Elkin; Fengwu Li; Changya Peng; Xiaokun Geng; Yuchuan Ding

BACKGROUND: The inflammatory response to acute cerebral ischemia is a major factor in stroke pathobiology and patient outcome. In the clinical setting, no effective pharmacologic treatments are currently available. Phenothiazine drugs, such as chlorpromazine and promethazine, (C+P) have been widely studied because of their ability to induce neuroprotection through artificial hibernation after stroke. The present study determined their effect on the inflammatory response. **METHODS:** Sprague-Dawley rats were divided into 4 groups: (1) sham, (2) stroke, (3) stroke treated by C+P without temperature control and (4) stroke treated by C+P with temperature control (n=8 per group). To assess the neuroprotective effect of C+P, brain damage was measured using infarct volume and neurological deficits. The expression of inflammatory response molecules tumor necrosis factor- α (TNF- α), interleukin-1 β (IL-1 β), intercellular adhesion molecule 1 (ICAM-1), vascular cell adhesion molecule 1 (VCAM-1), and nuclear factor kappa light chain enhancer of activated B cells (NF- κ B) was determined by real-time PCR and Western blotting. **RESULTS:** TNF- α , IL-1 β , ICAM-1, VCAM-1, and NF- κ B mRNA and protein expressions were upregulated, and brain damage and neurological deficits were increased after stroke. These markers of cerebral injury were significantly reduced following C+P administration under drug-induced hypothermia, while C+P administration under normal body temperature reduced them by a lesser degree. **CONCLUSION:** This study showed an inhibitory effect of C+P on brain inflammation, which may be partially dependent on drug-induced

hibernation, as well as other mechanisms of action by these drugs. These findings further suggest the great potential of C+P in the clinical treatment of ischemic stroke.

Relationship Between Soft Tissue Depth and Comorbidities

Kenneth Kutschman; Tristan Lemon; Ryan Kelly; Revella Gappy; Hal Baker; Brandon Foster; Sara Meram; James Paxton, MD, MBA, FACEP

Body mass index (BMI), defined as $[\text{weight}/\text{height}^2]$, is a ubiquitously used measurement to assess an individual's risk for obesity related co-morbidities. While useful, BMI is limited in that it overestimates the risk of muscular individuals by not considering body fat distribution. One alternative is to use proximal tibial measurements of soft tissue depth. A retrospective chart review was performed in an urban setting measuring the depth of soft tissue over the proximal tibia at various lengths. A two sample T-test was performed comparing soft tissue depth to various obesity related co-morbidities: MI ($p = 0.0119$), CAD ($p = 0.0516$), and Diabetes ($p = 0.1109$). The results indicate that there is a relationship between soft tissue depth and history of MI, however the length of soft tissue depth in patients who experienced MI ($N=23$) was less than those who did not experience MI ($N= 200$). More data on those who experienced an MI is needed for more conclusive results. There was no relationship found between soft tissue depth and history of CAD and diabetes.

Evaluating the Anti-Cancer Efficacy of a Synthetic Curcumin Analog on Human Melanoma Cells and its Interaction with Standard Chemotherapeutics

Krishan Parashar; Siddhartha Sood; Ali Mehadli; Colin Curran; Caleb Vegh; Christopher Nguyen; Christopher Pignanelli; Jianzhang Wu; Guang Liang; Yi Wang; Siyaram Pandey

Melanoma is the leading cause of skin-cancer related deaths in North America. Metastatic melanoma is difficult to treat and chemotherapies have limited success. Furthermore, chemotherapies lead to toxic side effects due to nonselective targeting of normal cells. Curcumin is a natural product of *Curcuma longa* (turmeric) and has been shown to possess anti-cancer activity. However, due to its poor bioavailability and stability, natural curcumin is not an effective cancer treatment. We tested synthetic analogs of curcumin that are more stable. One of these derivatives, Compound A, has shown significant anti-cancer efficacy in colon, leukemia, and triple-negative inflammatory breast cancer cells. However, the effects of Compound A against melanoma cells have not been studied before. In this study, for the first time, we demonstrated the efficacy of Compound A for the selective induction of apoptosis in melanoma cells and its interaction with tamoxifen, taxol, and cisplatin. We found that Compound A induced apoptosis selectively in human melanoma cells by increasing oxidative stress. The anti-cancer activity of Compound A was enhanced when combined with tamoxifen and the combination treatment did not result in significant toxicity to noncancerous cells. Additionally, Compound A did not interact negatively with the anti-cancer activity of taxol and cisplatin. These results indicate that Compound A could be developed as a selective and effective melanoma treatment either alone or in combination with other non-toxic agents like tamoxifen.

Individualized Assessment of Pregnancy in Labor to Predict Labor Dystocia and Cesarean Delivery in Nulliparous Women

Krishna Majmundar, BS; Percy Pacora, MD

The objective of this observational study is to assess the role that parental anthropometry, family and personal history have in predicting cesarean delivery in nulliparous women in spontaneous labor. 100 nulliparous pregnant women whose labor and delivery is attended at Hutzel Hospital, Detroit Medical Center, in Detroit,

Michigan will be surveyed about the maternal and paternal characteristics of the unborn child including birth weight of both parents and mode of delivery, gestational age at birth, and family history of cesarean delivery, large neonates, and various other medical conditions. Sociodemographic information, and neonatal and parental anthropometrics will be obtained. The primary outcomes to be assessed are the risk of cesarean delivery, variations in neonatal anthropometry and gestational age at birth. We introduce the concept of individualized medicine in labor in order to predict the diagnosis of labor dystocia. By providing physicians with important clinical information to predict abnormal labor and delivery, patients and providers can be better prepared to treat and prevent complications associated with labor dystocia, such as urgent cesarean deliveries and postpartum hemorrhage, which may help reduce neonatal and maternal mortality rates as well.

Perceptions of Plant Based Nutrition in Medical Education

Lakshman Mulpuri, BS; Lauren Dowell, MS; Audrey Lunde, BS; Marissa Ray, MS; Shanita Thomas, BA

Whole-food plant based nutrition has been found to uniquely address disease burden(1). However, medical students typically receive fewer than 20 hours of nutrition training (2). Intending to bridge this gap, our in-progress prospective longitudinal investigation aims to examine the impact of plant-based educational interventions on the viewpoints and attitudes of WSUSOM medical students. Interventions were implemented via the Plant Based Nutrition Group's (PBNG) activities and through M1's P4 course in 2019. Students were surveyed before and after the plant-based curriculum. Our survey (reference Dowell et al abstract) will continue to be administered annually to determine associations between longitudinal educational development and evolving perceptions of WFPBN. Chi-square, Kruskal-Wallis, and regression analysis will be used to determine associations between the aforementioned interventions and both long-term and short-term student perceptions. PBNG's opportunities for student engagement included: monthly lectures attended by 35-70 students; cooking demonstrations; and journal clubs. Approximately 26 students voluntarily attend all PBNG events. Curriculum interventions occurred over 1 month and included patient testimonials, lectures, three multiple choice assessments covering nutrition/preventive medicine, and an interactive curriculum day featuring 13 panels and a cooking demonstration. The analysis of our survey results are currently in progress.

1: (PMID=26514947)

2: (PMID=20736683).

Industry-Sponsored Payments Made to Interventional Radiologists from 2014-2017: A Protocol for a Study of the Open Payments Program

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The Open Payments Program (OPP) is a segment of the Affordable Care Act which mandates that industry payments made to physicians must be reported to the CMS. In order to improve transparency, industry payments made to physicians was made available to the public in 2013. Although intended in good faith to advance patient outcomes, physician-industry relationships have received a great deal of scrutiny. Concerns were raised that physicians may seek to reduce their participation in industry-sponsored research for fear of being regarded negatively by potential patients. Therefore, our study aims to examine changes in payments made to interventional radiologists by industry following institution of the OPP. Payments will be compared year-over-year from 2014 to 2017. Descriptive statistics such as drug companies will be applied to the dataset. Analyses will be performed using IBM® SPSS® Version 25. Our results will determine whether there has been a

significant change in the industry-sponsored payments to interventional radiologists in the years after industry payment data became available in 2013. Overall, our study may provide insight into radiologist behavior following the passage of the Sunshine Act and establishment of the OPD.

Impact of Technology on Sexual Health Knowledge

Lucki Word, MA; Jaila Campbell, BA; Manar T Edriss, BS; Destiny Stroman, BS; Jewel Evans; Melanie Hanna-Johnson, MD, MHSA; Anil NF Aranha, PhD

Introduction: Technological developments, such as mobile devices, have enhanced communication for individuals. Currently, search engines allow for exploration of information related to various topics. Our study evaluates the impact of social collaborations on sexual and reproductive health knowledge (SRHK). Methods: A 50-item survey, integrating factors of sociodemographics, number/type of social collaborations, technological communication use, and SRHK, was developed to assess familiarity with sexual health perceptions. The survey was provided to consenting patients, in an ambulatory care setting. Data was coded using IBM-SPSS. Statistical analysis included: Pearson correlation, t and Chi-squared tests. Statistical significance was established at $p < .05$. Results: 75 patients completed the study, mean age 57.4 ± 15.2 years, 87.7% female, 79.5% African American, 97.2% with a High School education, and 68.5% had incomes $< \$ 50,000$. The study group had a mean SRHK score of 9.0 ± 4.3 (scale of 0-18). The quantity of technological communications ($p < .001$), and number of social collaborations, were positively associated with SRHK. Conclusions: Our study indicates that amplified technological communications, with increased social collaborations, may have a significant beneficial impact on SRHK, enabling improved awareness of sexual health among participants. Additional research to advance these results is merited.

A Rare Case of Primary Leiomyosarcoma of the Breast in a 61 Year Old Woman

Luke Horton, BA; Madeline Wohlfeil, BS; Lydia Choi, MD

Primary leiomyosarcoma of the breast is an extremely rare malignancy accounting for less than 0.0006% of all breast malignancies; there are fewer than 80 cases in the literature to date. Here, we present a rare case of leiomyosarcoma of the breast in a 61-year-old woman without traditional risk factors. This case was treated surgically with lumpectomy requiring a larger margin than more common breast carcinomas due to the high rate of local recurrence and highly aggressive nature of the tumor. Leiomyosarcoma of the breast is extremely rare and requires excision with histopathologic analysis to diagnose. Patients with leiomyosarcoma of the breast have a relatively poor prognosis compared to other common breast cancer types; with a five-year disease-free survival of 33-52%, making frequent follow up and monitoring for post resection recurrence essential to patient's long-term wellbeing.

p-16: Immunohistochemical Staining to Differentiate an Inflamed Atypical Nevus from Metastatic Melanoma

Madeline Adelman, BS; Alexis B Lyons, MD; Lauren Seale, MD; Ben Friendman, MD

In the monitoring of patients who have had metastatic melanoma, repeat skin exams at specific intervals is a crucial screening tool to prevent recurrence. At many of these visits, suspicious melanocytic lesions are biopsied to determine if they represent a return of the patient's melanoma. Here, we present a case of a suspicious atypical melanocytic nevus discovered during a skin exam following diagnosis of metastatic melanoma to a lymph node from an unknown primary lesion. To determine whether this lesion was melanoma, p16 immunohistochemical staining was performed of both the lymph node biopsy and the nevus, and provided

a reliable means for determining the nature of the nevus. This information would be helpful to readers who care for patients with a history of melanoma who require differentiation of atypical nevi from recurrence of melanoma.

Single vs Multiple Laparoscopies: A Pain Status One Year After Hysterectomy for Chronic Pelvic Pain

Ghadear Shukr, MD; Madeleine Gonte; Victoria Webber; David Eisenstein, MD

Chronic pelvic pain (CPP) has a prevalence of 3.8% amongst women and costs the U.S. \$881.5 million annually in healthcare resources (Howard 2003). In one study, 15% of employed women reported time lost from paid work and 45% reported reduced productivity due to CPP (Methias et al 1996). The current gold standard in working up CPP is laparoscopy, with 40% of all laparoscopies in the U.S. performed for this condition (Bhatia et al). However, limited data exists relating the clinical importance and outcomes for repeat diagnostic laparoscopies. This is a retrospective case-control study to determine the incidence of multiple laparoscopies for CPP over the past 10 years, and to compare outcomes between patients who underwent single (29 patients) vs multiple (29 patients) laparoscopies. We also analyze the frequency of complications from such laparoscopies as well as the frequency of attempted non-surgical therapy prior to surgical exploration in females suffering from CPP. Our results indicate that the resolution of pain in patients who undergo multiple laparoscopies for the indication of CPP is similar to patients undergoing hysterectomy after single laparoscopy. Therefore, we propose that patients who undergo multiple laparoscopies warrant discussion of hysterectomy.

The Effects of Estrogen on Endothelial Cells in Shock-like Conditions

Lawrence Diebel, MD; David Liberati, BS; Madison Wheaton, BS

Sexual dimorphism in trauma outcomes has been demonstrated in both clinical and animal studies. This may be due to the protective effects of the female gender and/or estrogen/agonists against trauma hemorrhagic shock (T/HS) related impaired microcirculation, associated organ dysfunction, transfusion requirements and ultimately morbidity and mortality. Acute traumatic coagulopathy is associated with poor outcomes in severe trauma. The etiology is multifactorial but includes impaired endothelial barrier function and endothelial glycocalyx degradation. Sex hormones have been shown to alter hemostatic and inflammatory response to T/HS. We therefore hypothesized that there would be sex hormone differences in the effect of T/HS on endothelial and glycocalyx barriers. This was studied in an in vitro model.

Plant Plunge: Effects of a 30-Day Plant-Based Diet

Marissa Ray, MS; Lauren Dowell, MS; Lakshman Mulpuri, BS; Audrey Lunde, BS; Shanita Thomas, BA

Lifestyle modifications, particularly adoption of a plant-based diet (PBD), represent an underutilized therapeutic resource in the treatment and prevention of chronic disease. PBDs are linked to improvements in various diseases, including cardiovascular disease(1), diabetes(2), and depression(3). Peer health initiatives represent a mechanism for lifestyle change which provide psychological motivation and peer support. This proposed investigation aims to retrospectively analyze the results of a voluntary 30-day PBD program (Plant Plunge; PP) among first- and second-year medical students at WSUSOM. PP recruited participants voluntarily via the WSUSOM listserv. PP instructed participants to follow a 30-day PBD. Each week, meetings were organized to encourage peer discussion and offer guidance from Physicians Committee for Responsible Medicine certified instructors. On the first and last day, PP collected physiologic data (glucose, total cholesterol, blood pressure) and self-reported mental health data (abridged Warwick-Edinburgh

Mental Well-Being Scale). We propose to review the results via Chi-square and Wilcoxon-rank-sum analysis to determine if any collected metrics differed after participation in the PP program. Regression analysis may be used to adjust for covariates and derive any associations between baseline and outcome characteristics. This investigation will determine the psychosocial and physiological effects of a 30-day plant-based group health initiative.

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3:PMID=24524383

Time-to-Scene for Opioid Overdoses – Are Unmanned Aerial Drones Faster Than Traditional First Respondents in an Urban Environment?

Matthew R Tukel, BS; Connor A Tukel, BS; Robert Weinbaum, BS; Philip D Levy, MD, MPH

Introduction: Opioid overdoses claim tens-of-thousands of lives every year. Many of these deaths might be prevented if overdose-reversal medications such as naloxone are administered in a timely manner. Drones may help overcome barriers to timely arrival on scene for opioid overdoses. This study analyzes the time required for a drone carrying naloxone to traverse various distances, simulating the response time for a drone to the scene of an opioid overdose. For comparison, we used the time required for ambulances to traverse similar distances while responding to the scene of actual or suspected opioid overdoses. Methods: Fifty flight trials, using a modified DJI Inspire 2 drone, were conducted across seven distances, and the travel time for the drone was then compared with historical response time data from 200 actual or suspected opioid overdose cases that occurred within Detroit, Michigan. Results: We determined with 95% certainty that drone arrival times were discernibly quicker than ambulance arrival times at all distances where sufficient data were available to perform statistical comparisons including 0.5 km, 1.0 km, 1.5 km, 2.0 km, and 3.0 km. Conclusion: We have shown that a drone is capable of traveling several ranges of straight-line (i.e. “as the crow flies”) distance faster than an ambulance. Further exploration into the use of drones to deliver life-saving therapies in urban and rural settings is warranted. Head-to-head prospective trials that consider the practical challenges of medical drone delivery are needed to better understand the viability of incorporating this technology into existing emergency response infrastructure.

Short-Term Outcomes from Total Hip Arthroplasties at an Ambulatory Surgery Center

David Mayo, MD; Donald Siwek, MD; Michael McIntosh, MS, BS

The need for total hip arthroplasties (THA) has increased over the past few decades. This trend will increase into the future as well. As health care economics have placed a premium on cost effective, value-based care, the number and types of surgeries done in ambulatory surgery centers (ASC) have increased. It is important to determine the feasibility of THAs in this setting. The study is a retrospective, observational chart review from THAs performed at an ASC (n=230) using a multi-modal anesthesia protocol. Data points measured include intra-operative and post-operative opioid use, time to discharge, anti-emetic drug use, and pain scores. Following discharge, adverse events including hospital re-admission and surgical site infections (SSI) rates were recorded. The results show that THAs were safely and efficiently performed in an ASC setting with minimal pain, opioid requirements, or side effects. Patients were discharged to their home the day of surgery, independent of intra-operative opioids. The hospital re-admission and SSI rates were less than the national averages. As THAs continue to increase in numbers; safe, cost-effective, outpatient alternatives will continue to expand. Expertise with these procedures in ASC settings is necessary to ensure future growth, safety, and success.

Surveying A Healthy Corner Store Intervention

William Banks, BS; Nona Bhatia, BS; Michael Franklin, BS; Hannah Gloede, BS; Rami Youssef, BS; Molly N Pantelic, MS

Background: Food insecurity affects 14.3% of Detroit households. Recently, there has been interest in using corner stores for healthy eating interventions in food deserts where food insecurity is prevalent; one such program is conducted through Auntie Na's Village at the E&N Corner Store in West Detroit, where participants are given a \$6 incentive towards healthy items at the store. This study presents results from a survey of program participants conducted in Summer 2019. Methods: N = 30 adult corner store program participants were given a 10 question survey about healthy eating and their thoughts on the corner store. Results and Conclusions: 86.67% of participants value healthy eating, and 86.67% would like to be eating fruits and vegetables daily, but only 50% are meeting their goal. 46.67% of participants use the corner store to purchase healthy foods, while 90% buy snacks. 20% of patrons do not buy fresh fruits/vegetables because they do not last. Barriers to healthy eating include price (46.67%), few options (63.33%), and poor quality (20%). Based on these results, we recommend that the corner store increases selection of healthy, low cost snack and frozen options to improve patron health and satisfaction.

Epidemiology of Upper Extremity Weight Lifting Injuries

Muhammad Abbas, BS; Jordan Brand, MD; Elise Anderson, BS; Danni Feng, BMA; Irene Chen, MA

Understanding the epidemiology of weight lifting exercises is imperative for medical professionals to help raise awareness and inform the public about using proper safety. Using the NEISS database from 2008-2017 we compared the different types of upper extremity injuries between males and females. Database entries and national estimates were then sorted in 5-year age groups between the ages of 15-80+. The data was then broken down into the different types of upper extremity injuries based on body part codes and the type of injury that was reported. The results of the database showed 886,152 weight lifting injuries, and that 79.83% of those injuries were males. The most commonly injured body part regardless of gender was the shoulder, and the most common type of injury was a sprain. Males between the ages of 15-19 had the most reported injuries, the most common location being a "place of recreation or sport", while females reported the most commonplace of injury as "School". The reported majority of these patients were experiencing injuries in the setting of exercise facilities and schools. This illustrates the importance of supervision and the value of education when beginning any weight lifting program, especially in our teenage patient populations.

Role of Magnetic Resonance Imaging Fusion Prostate Biopsy in Patients with Prostate Cancer on Active Surveillance Who Went on to Have a Radical Prostatectomy

Isaac Palma-Zamora; Akshay Sood; Philip Olson; Guillaume Farah; Deepansh Dalela; Sohrab Arora; Marcus Jamil; Jacob Keeley; Natalija Kovacevic; James Peabody; Craig Rogers; Mani Menon; Ali Dabaja; Firas Abdollah

INTRODUCTION AND OBJECTIVE: Patients who are diagnosed with low risk clinically localized prostate cancer may opt for active surveillance (AS). Our study evaluates the use of MRI Fusion prostate biopsy (MFB) in patients on active surveillance who went on to have definitive surgical management.

MATERIALS AND METHODS: Single institution retrospective review of 221 patients who underwent MFB between October 2015 and August 2019. Ninety-five were on active surveillance, of which 29 went on to have a radical prostatectomy. Gleason scores from double sextant 12-core specimens were compared to those of regions of interest, and to the final pathology specimen where appropriate.

RESULTS: In patients who were managed with active surveillance, the rate of cancer detection on subsequent biopsies is similar between TRUS and MFB (74% vs 75%, $p=0.87$). Of the 29 patients that had a radical prostatectomy 26 out of 29 had positive TRUS cores compared to 27 out of 29 that had positive MFB cores. The final pathological score coincided with TRUS and MFB on 30% and 44% of the time ($p=0.30$), respectively. Similar upgrading rates were noted between TRUS and MFB (44% and 53%, $p=0.61$). **CONCLUSIONS:** Given the similarity in detection rate and concordance of Gleason score with final pathology between TRUS and MFB, the utilization of MFB might not be necessary in this setting, as it is associated with higher financial burden.

First Aid First: Implementation and Evaluation of a Community-Based First Aid Training Course

Rafael Ramos, MS; Luke Wesemann, BS; Aileen Haque, BS; Raymond Chung, BS; Evan Zeddies, BA; Brian Fennell, BA, MPH; Elizabeth Moore, MS; Brandon Foster, BS; Amman Bhasin, BS; May Chammaa, BA; Jennifer Noble, MD; Brian Reed; Nana Ama Baffoe, MS, Bethany Foster, MPH; Kristiana Kaufmann, MD; Claire Pearson, MD, MPH

In 2018, medical students at Wayne State University School of Medicine (WSUSOM) created a first aid training initiative called First Aid First (FAF). FAF is a comprehensive community-based training program that teaches lifesaving skills tailored for Detroit. The objective of this initiative was to improve the confidence and basic first aid skills of those who attend trainings. Pre- and post-test surveys were used to measure knowledge, confidence and skill level. The survey data gathered from March 2018-October 2019 consisted of 5 Likert scale questions for self-evaluation component and 23-25 multiple choice questions, number depending on time of administration due to continual curriculum revisions. A total of 404 Detroit community members were trained. The median age was 40.9 and 30% had no previous first aid training. Using a Likert scale (1= strongly disagree and 5= strongly agree), participants stated that post-training they were confident with responding to a medical emergency (4.4/5; $p\text{-value} < 0.0001$). Pre- and post-test scores showed significant improvement. FAF has been effective in the Detroit community. Participants have reported increased self-efficacy and basic first aid knowledge. With more community members knowledgeable about first aid, more bystanders can respond to a medical emergency.

Can We Safely Reduce the Cesarean Birth Rate Among Extremely Obese Pregnant Women?

Reem Kashlan, MPH; Alvin Varghese; Federico G Mariona, MD, FACOG

Obesity is a prime example of a non-contagious disease that has reached pandemic proportions. Female obesity during the reproductive years has been consistently reported in association with a number of adverse events, both for the mother, the fetus with short- and long-term health effects on both, including and not limited to cardiac disease, obesity and early death. The effects of obesity are seen early in the reproductive period and are a continuum during prenatal care and delivery. Extreme maternal obesity is consistently reported in association with dysfunctional labor and increased risk for cesarean delivery and certain complications like post-partum hemorrhage and surgical site infection. We report a retrospective secondary analysis of a limited cohort of nulliparous, extremely obese women with body mass index (BMI) ≥ 50 Kg/m², delivering at term (≥ 37 weeks gestation), carrying a single live normal fetus in vertex presentation (NTSV). These patients have been cared for by a limited number of board-certified obstetrical providers, in the same institution. This group of patients has been selected because they are considered candidates for an effort at safely reducing the cesarean rate. They are part of a larger group of patients included in our bariatric obstetric database which includes pregnant women with BMIs between 50 and 106 Kg/m² that are reported separately. The clinical results indicate a high incidence of

induction of labor, followed by failed induction of labor and delivery by cesarean. These results may represent a local practice that may not be generalizable to other geographic practice locations or a true decreased ability to reduce cesarean delivery in extremely obese pregnant women. We encourage multi-institutional well conducted studies to determine if this population should be differentially considered as NTSV-XTO and reported as a distinct group.

Role of Delivery and Feeding Methods of the Development of Postpartum Depression in Primipara Mothers

Emma Drenth, BS; Besma Aly, BS; Ria Minawala, BS; Alaa Abu-Mahfouz, BS; Krishna Majmundar, BS; Eva Waineo, MD; Ginger Connor, MD

The objective of this study is to assess the correlations between delivery methods and feeding methods on the rates of postpartum depression (PPD) in first-time mothers (gravida 1, para 1, abortus 0) by examining the multifactorial manifestations of PPD and the influence that these two specific factors have on a mother's psychological wellbeing. We hypothesize that mothers who underwent a cesarean section will exhibit higher rates of PPD on the Edinburgh Postnatal Depression Scale (EDPS) when compared with mothers who delivered vaginally. We also hypothesize that mothers who chose to bottle feed, or those who were unable to breastfeed despite their peripartum plan to do so, will exhibit higher rates of PPD as measured on the EPDS when compared to mothers who breastfed exclusively. This retrospective study will focus on the review of patient charts of primipara women at their first two postpartum visits, held between 1 and 12 weeks after delivery, who have been screened for PPD using the EPDS. The patient charts will be of women whose obstetric care was attended at the Women's Excellence clinics in Lake Orion, Birmingham, Clarkston, Rochester Hills, and West Bloomfield, Michigan and whose delivery occurred between January 2017 and December 2019.

Unique Presentations of Post Renal Transplant Gamma Delta T-Cell Lymphoma

Rujuta Patil, MS; Anita Patel, MD

Post-transplant lymphoproliferative disorder (PTLD) is serious complication occurring in 10% of solid organ transplant recipients (R). We present 2 recipients that developed gamma delta T-cell lymphoma (GDTL) post renal transplantation. R1 developed primary cutaneous (PCGDTL) and R2 developed hepatosplenic (HSGDTL). R1 was a 67-year-old Caucasian male who was EBV IgG + and mismatched CMV IgG -. He presented 1-year post transplant with diffuse lymphadenopathy on body PET CT. Biopsy of left axillary lymph node, skin, and bone marrow revealed PCGDTL. Following treatment with 6 cycles of EPOCH regimen with complete resolution, his disease relapsed 2 months later and he died with a functioning allograft within 1 year of diagnosis. R2 was a 44-year-old African American male who was EBV IgG+ and non-mismatched CMV IgG. He presented 7 years post transplant with moderate hepatosplenomegaly on abdominal CT. Peripheral blood flow cytometry and bone marrow biopsy revealed HSGDTL. He was treated with 2 cycles of CHOEP regimen with treatment failure and 3 cycles of salvage therapy (Gemcitabine, Decadron, Carboplatin) with complete resolution. He relapsed with leukemic conversion 2 months later and died with a functioning allograft. Our cases demonstrate that GDTL is an aggressive neoplasia with rapid onset and poor prognosis.

False Positive D-Dimer in Urban Emergency Departments

Ryan M Kelly; Tristan Lemon; Kenneth Kutschman; Sarah Meram; Elizabeth Dubey, MD; Benjamin Ross; Ashley Fulton; Danni Feng; Raymond Chung; Brian Reed; James Paxton, MD, MBA, FACEP

The serum d-dimer level is commonly used in the emergency department (ED) to rule out venous thromboembolism (VTE). Unfortunately, this test has low specificity for VTE. False positive d-dimer tests increase the cost of care, and may place patients at unnecessary risk. This project aims to identify patient characteristics associated with false positive d-dimer levels. A retrospective chart review was conducted, including all d-dimer levels drawn for ED patients presenting to two large, urban EDs over a 24-month period (2015-2016). Patients were excluded if d-dimer levels were obtained outside of the ED. A total of 3,070 patients were included. 5.2% of the 1,616 patients with elevated d-dimer level received a diagnosis of a VTE, while 0.96% of patients with normal d-dimer level had VTE ($p < 0.0001$). We found no significant difference between true-positives and false-positives d-dimer levels in relation to patient age ($p = 0.63$) or sex ($p = 0.60$). Our preliminary results confirm that d-dimer is a sensitive, but nonspecific test for VTE. We did not identify a relationship between false-positive d-dimer level and patient age or sex. Additional characteristics will be evaluated to further characterize this population.

Improving Hearing Screening with Tele-Otology

Ryan J Miller; Joshua George-Lopez; Robert S Hong, MD, PhD

The Lions Hearing Center of Michigan (LHC-MI) is an assistance program in Detroit that provides hearing aids to individuals in need. LHC-MI has provided thousands of hearing aids, but such efforts have been costly, requiring patients to make multiple appointments at multiple locations with both volunteer audiologists and physicians. To streamline this process, the LHC-MI is piloting a new program, titled "Hear Now! Detroit!", that uses telemedicine to reach patients at community sites. With "Hear Now! Detroit!", teams of community volunteers equipped with iPad audiometers and video otoscopes are being deployed to screening sites to collect data that can be later reviewed by off-site physicians. Preliminary data have been collected to assess the usability of the screening devices, quantity of hearing loss detection, and patient satisfaction with the "Hear Now! Detroit!" model. To date, 69 individuals have been evaluated at community hearing screening sites, resulting in 6 referrals after off-site review. A physician reviewed the audiogram and otoscopic data, reporting an average overall ability to make recommendations of 1.68 (0-2). All patients reported an overall satisfaction of 5 (1-5). Next steps include further observation to evaluate outcomes for patients who were referred for follow-up due to significant hearing loss.

Comparison of SOX-10, HMB-45, and Melan-A in Benign Melanocytic Lesions

Sabrina E Dass, BA; Taryn Huizenga, MD; Darius R Mehregan, MD

Immunohistochemical stains are used in dermatopathology to identify target proteins in cells and can be helpful in diagnosing melanocytic lesions. Three immunohistochemical stains, SOX-10, HMB-45, and Melan-A, were used to assess the difference in the number of melanocytes stained in benign melanocytic lesions. All three stains are used as a marker for melanocytic lesions, however some stains may be superior to others. It was found that the three markers have a significantly different ability to stain melanocytes ($p = 0.0010$, ANOVA). The difference in the number of stained melanocytes were highly significant between HMB-45 and SOX-10 ($p = 0.0031$) and between HMB-45 and Melan-A ($p = 0.0042$). Overall SOX-10 stained 0.195 more melanocytes than HMB-45 ($p = 0.0026$). Similarly, Melan-A stained 0.195 more melanocytes than HMB-45 ($p = 0.0011$). However, the difference between SOX-10 and Melan-A was not statistically significant ($p = 0.9810$). Larger scale studies are needed to confirm these results, which will lead to more accurate diagnoses of melanocytic lesions.

Pregnancy of Unknown Location in Cohort of Patients Treated with Methotrexate

David Eisenstein, MD, FACOG; Omar Zwain, MD; Gahdear Shukr, MD; Sanjana Kulkarni, BS

INTRODUCTION: The purpose of this retrospective study is to determine the prevalence of pregnancies of unknown location (PUL) inadvertently treated with Methotrexate and secondarily to determine the b-hCG treatment outcomes. **METHODS:** This is a retrospective cohort study of patients who received Methotrexate treatment for treatment of ectopic pregnancy over a 10-year period in the Henry Ford Hospital System. **RESULTS:** A total of 150 pregnancies were identified as treated with MTX over a 10-year period. Based on the ultrasound the pregnancies were categorized as Pregnancies of unknown location (PUL), Ectopic pregnancy (EP), or intrauterine pregnancy (IUP). There were 47 PUL, 101 EP and 2 IUP. Approximately 1/3 of the patients treated with MTX were PULs. The mean baseline beta-hCG was 2960 MIU/mL and the average b-hCG at treatment was 4188 MIU/mL for the entire cohort. Resolution of b-hCG with one dose of MTX differed between pregnancy types with pULs prescribed MTX at a lower b-hCG level on day of treatment (56% vs 27% at b-hCG less than 1000 MIU/mL) compared to EP. Also, 61% of the entire cohort was treated with 2 b-hCG points or less. 38% of PUL were treated with 1 to 2 b-hCG values and 82% PUL were treated with b-hCG <2000 MIU/mL. **CONCLUSION:** There may be an underappreciated risk of inadvertent administration of Methotrexate to patients with early IUP. A minimum of three b-hCG assays over seven days is the diagnostic algorithm for EP would decrease treatment of PUL.

Perceptions of Inpatient Nutrition Guidance at Sinai Grace Hospital

Shanita Thomas, BA; Lauren Dowell, MS; Lakshman Mulpuri; Marissa Ray, BA, MS; Audrey Lunde, BS; Arun Sherma, MD

Coronary artery disease and stroke are leading causes of death in the US(1) and a positive history of either is associated with an increased likelihood of a second event within 5 years(2). The role of diet in controlling risk factors related to cardiovascular and cerebrovascular disease has been well- demonstrated. It is unclear if healthcare providers are adequately providing counsel and if patients are understanding the importance of dietary lifestyle modifications(3). This proposed investigation aims to describe the nutritional counseling provided to patients admitted for cardiovascular and cerebrovascular events at Sinai Grace Hospital (SGH) in Detroit, MI. Perceptions related to nutritional counseling will be collected from a convenience sample of aforementioned patients as well as SGH care providers. The following characteristics will be collected via medical record review: consultation with dietitians/nutritionists, physician orders concerning specific diets, and notation of nutritional counseling. Recollections and perceptions will be collected via phone call and survey. Chi-square and Wilcoxon-rank-sum analysis will determine if perceptions differ significantly between physicians and patients as well as any associations between actual counseling provided and perceived counseling provided. Regression analysis may be performed to control for covariates.

1:PMID:30700139

2: PMID:8303740

3: PMID:28551044

Addressing People Experiencing Developmental Disabilities in Medical Education

Brandon Batarse; Shelby Freeberg; Malik Hindawi; Allison Surma; Mark Zakrajsek; Jennifer Mendez, PhD

ARIE-Developmental Disabilities Institute (ARIE-DDI) is a program at Wayne State School of Medicine that allows medical students to interact with families with children experiencing developmental disabilities. This is done through the use of surveys, home visits and spending time together in an informal setting. The goal of the program is to understand the needs of people experiencing developmental disabilities and their families, and to assess ways in which medical education can be improved in order to fill the gaps that have resulted in this population being underserved in healthcare settings. A survey was sent out before and after ARIE-DDI was active for the year, to both students who did and did not participate in ARIE-DDI, in order to assess the effectiveness of the program on how comfortable students feel with interacting with people experiencing developmental disabilities.

Ultrasound-guided out-of-plane (OOP) adductor canal continuous catheter placement 2 compared to in-plane (IP) placement in total knee arthroplasty: a randomized, single 3 blinded, pilot clinical trial

Sandeep H Krishnan, MD; Kaveh Nabavighadi, MD; Carter Battista, MD; Elliot Harmon, MD; Samir Patel, MD; Farhad Ghoddoussi, PhD; Brendan Lynch, BS

Background: Total knee arthroplasties are a very common procedure. With them comes severe post-operative pain in most patients and modest pain in the remainder.¹ Post-operative pain delays early intensive physical therapy, thereby prolonging rehabilitation. Since adductor canal blocks have largely replaced femoral nerve blocks, further research is necessary to determine the optimal orientation and approach for placement of adductor canal catheters, as catheter migration can be a significant problem that can lead to decreased analgesia and increased postoperative pain. To date there have been no trials to assess the efficacy and optimal technique for adductor canal blocks for TKA procedures. Objective: Measure the effectiveness and ideal technique of adductor canal catheter placement in plane or out of plane on postoperative analgesia in patients receiving total knee arthroplasties. Design: In this single-center, randomized, parallel-group, single-blinded trial, we compared average post-operation pain scores, total opioid utilization (oral morphine equivalent), length of stay in the hospital (LOS), total ondansetron and Ketorolac administration and the incidence of the antiemetic medicine administration for the two IP & OOP groups. 100 patients were enrolled in the study initially with IP (n=55) and OOP(n=45), Data for 31 patients was excluded from the study resulted in total of 69 patients (IP=39 and OOP=30). 19 for not receiving the pre-operation cocktail, 9 for pre operation chronic narcotic use, 4 for no post operation scores was recorded for them and 1 for excessive use of opioid analgesics post-operatively (being an extreme outlier for total opioid use). Procedures we completed by attending physicians and residents of the Department of Anesthesiology at St. Joseph Mercy Hospital in Oakland. Results: There was no significant difference between the test groups for any of the following variables: length of stay in the hospital, pre-operation pain score, average post-operation pain score, total opioid consumption (mg) (oral morphine equivalent), total ondansetron consumption (mg), total acetaminophen consumption (mg), and total ketorolac consumption (mg) and the incidence (percentage of the patients) who received anti-emetic drug. Discussion: This study aimed to measure the effectiveness of paths for adductor canal catheter placement. The goal was to assess if the in-plane method was superior to the out of plane method with regards to postoperative analgesia and hospital length of stay. The OOP ACCC technique did not provide superior analgesia or decrease opioid consumption when compared to the IP ACCC technique. Both techniques can be used interchangeably for analgesia status-post TKA.

Arab American Obesity Prevalence in Southeast MI

Suma Alzouhayli; Noor Sulieman; Zaina Khoury; Ziad Fehmi; Joseph Trak, MD; Nabil Rahoui, MD; Sarah Farooqi, MD; Ibrahim Tsolakian, MD; Rouba Ali-Fehmi, MD

Obesity is a major global health concern that increases the risk of early comorbidities and death. According to the World Health Organization, the United States continues to rank in the top 20 for countries with the highest obesity prevalence. Nationally, the CDC reported 39.8% of Americans had obesity in 2015-2016, differentiating between the prevalence of obesity among different ethnic groups, including Hispanics (47%), non-Hispanic blacks (46.8%), non-Hispanic white (37.9%), and non-Hispanic Asians (12.7%). Although Arab Americans have distinct cultural norms that may contribute to obesity, they are not yet considered a distinct racial or ethnic group as defined by the United States Census. Given the limited obesity-related data on the Arab American demographic, this study aims to define the obesity epidemic in the Arab American community. Thus far, our data (n= 1994) collected via retrospective medical record abstraction from the Wayne State University Student Clinic and Dearborn ACCESS community clinic suggests 31.2% of Arab Americans in Michigan have obesity. The results show a significant increase in the prevalence of obesity with increasing age ($p < 0.001$), however, no significant differences in the prevalence of obesity was found between males and females ($p = 0.1$). Our results also indicate systolic blood pressure was significantly higher in obese individuals compared to individuals with normal BMI ($p < 0.001$). In the long-term, this project will provide data to increase awareness and improve education to reduce the rate of obesity in this population.

Comparison of Tibial Intraosseous Insertion Sites

Tristan Lemon; Ryan Michael Kelly; Kenneth Kutschman; Revelle Gappy; Hal Baker; Brandon Foster; Sarah Meram; James Paxton, MD, MBA, FACEP

Intraosseous (IO) catheterization can be used to emergently administer fluids or medications to patients when direct venous access is delayed or impossible. Although the proximal tibia is the most common location for IO insertion in adults, no consensus of opinion exists on the best technique for identifying the precise insertion site. We sought to compare the two most commonly-referenced sites (2-cm medial to the tibial tuberosity (Method A) and 1-cm superior to this point (Method B)) using cross-sectional computed tomography (CT) imaging. Retrospective chart review was conducted including CT imaging of the lower extremity from 208 adult patients (during 2009-2018). A paired samples t-test showed that the tibial diameter was significantly larger using Method A compared to Method B ($t(207) = -5.79, p < 0.001$). The standard deviation of the mean diameter using Method B was more than 4 times larger than that obtained by Method A. These results suggest that Method A provides a larger tibial diameter with less variation than Method B, supporting Method A as the preferred IO insertion site. Additional research is needed to determine whether these greater cross-sectional diameters corresponds with superior insertion success rates, flow rates, or other clinically-relevant outcomes.

The Correlation Between PROMIS UE and PI with Grip Strength

Charles Day, MD, MBA, Eric Guo, BS, Dylan Koolmees, BS, Cade Cantu, BS, Zack Montgomery, BS

Functional evaluation of patients with hand and wrist disorders commonly involves objective and subjective measures. Objective metrics commonly used include range of motion testing, physical exam, and grip strength. Subjective forms of evaluation include survey questionnaires and patient reported outcome (PRO) instruments. One PRO that continues to gain popularity is the Patient-Reported Outcome Measurement Information System (PROMIS). PROMIS uses multiple question domains and computer adaptive testing (CAT) to measure patient health across many health conditions. PROMIS Upper Extremity (UE) and PROMIS Pain Interference (PI) are among the domains specifically used for the measurements in hand and wrist disorders. One objective measurement is grip strength. Grip strength is quick assessment that has been used for a variety clinical purposes,

including evaluation of upper limb impairment, work capacity after injury, and as an overall fitness assessment. The purpose of this study is to analyze the correlation of PROMIS CAT forms and grip strength in patients with hand and wrist disorders. The authors hypothesize that there will be a correlation between the grip strength score and PROMIS UE, and PROMIS PI.

Minimal Clinically Important Difference PROMIS Scores in Carpal Tunnel Syndrome with Concomitant Trigger Finger or Carpometacarpal Joint Arthritis

Charles Day, MD, MBA, Zachary Montgomery, BS, Eric Battista, BS, Arvind Balasundaram, BS, Brooke Garnica, BS, Nikhil Yedula, BS

Patient reported outcome (PRO) measures have become an important tool for determining the quality of patient care within multiple specialties. One of the most popular and novel PRO instruments currently used in the field of orthopedic hand surgery is the Patient-Reported Outcome Measurement Information System (PROMIS). PROMIS is a patient questionnaire containing multiple domains that are useful in establishing a baseline score of patient disease, as well as an assessment of patient response to treatment. With the advent of PROMIS in the assessment of hand surgery, it is vital to establish minimal clinically important difference (MCID) that determines a score change that indicates a clinically significant response to treatment for any specific hand condition. Previous studies have shown MCID in PROMIS Upper Extremity (UE), Physical Function (PF), and Pain Interference (PI) for carpal tunnel syndrome (CTS). However, these studies presented different values for the MCID of carpal tunnel release and have not looked at CTS with concomitant hand conditions. The purpose of this study is to give further validation to these MCID values for carpal tunnel release while establishing PROMIS UE, PF and PI MCIDs for carpal tunnel release with concomitant trigger finger or concomitant carpometacarpal joint arthritis.

Trends in the Sources of Endophthalmitis at Kresge Eye Institute

Anita Vaishampayan, BS; Jamie Keen, MD; Sarah Syeda, MD; Xihui Lin, MD

Endophthalmitis is defined as a purulent inflammation of the intraocular fluids, namely the vitreous and aqueous humor. We sought to determine these sources at our institute and to look for trends in our urban population. A retrospective chart review of patients who attended the Kresge Eye Institute in Detroit, MI between 2003 to 2018 was performed. From billing results, 168 patients were identified, of these, 101 with culture results were included. Culture results were negative in 60 patients, positive for bacteria in 30, and positive for fungi and viruses respectively in 4 patients. Gram-positive bacteria including staphylococcus epidermidis were the most common pathogens cultured. We believe this information will prove beneficial in guiding diagnosis and management strategies of endophthalmitis in urban populations. Future directions include the analysis of the specific organisms involved and their susceptibilities.

A Brief and Comprehensive History of Total Hip Arthroplasty

Abdulah Haikal, BA

It is well established that total hip arthroplasty is one of the most successful surgeries of all times. With humble roots stemming from surgical approaches developed after the renaissance, THA is now performed 300,000/yr in the United States. Although profound writings have been made regarding the history of THA, this is believed to be the first paper to provide a comprehensive account. The importance of understanding THA's history allows for to explore the emergence of various surgical approaches, prosthetic techniques, and cultural revolutions which significantly aided the success of THA. Acknowledging that this research may contain gaps due to inherent flaws of paleopathological data, historical analysis,

and ongoing studies of THA benefits, risks, and indications, I do my best to present a brief and comprehensive evolution of total hip arthroplasty.

Measuring Changes in Electrical Impedance during Cell-Mediated Mineralization

Rafael Ramos, MS; Kairui Zhang, MS; David Quinn, BS; Stephen W Sawyer, PhD; Shannon Mcloughlin, BS; Pranav Soman, PhD

Cell-laden hydrogels have been widely used in bone tissue engineering to model cell-mediated mineral deposition that occurs within native bone tissue. Although the chemical composition and morphology of cell-mediated mineral deposits have been well characterized, little is known about the electrical properties of the deposited mineral. This study aimed to characterize the changes in the electrical impedance properties of the cell-laden hydrogel constructs after mineral deposition from osteoblast-like cells, using a novel soft interface electrical testing chip developed in house. Saos-2 osteosarcoma cells encapsulated within photocrosslinkable gelatin methacrylate (GelMA) hydrogels were chemically stimulated in osteogenic media for a period of up to 4 weeks. In parallel, a custom-made chip was used to measure the electrical impedance of mineralized constructs at weekly intervals between encapsulation and 4 weeks. Results demonstrated that an increase in cell-mediated mineral deposition caused a drop in the electrical impedance of the hydrogels, indicating an increase in construct conductivity. Material and morphological characterization of the deposited mineral confirmed its identity as cell-derived carbonated hydroxyapatite. This work provides new information about the electrical nature of deposited mineral and could potentially serve as a first step toward understanding the origins of bioelectricity within mineralized in vitro constructs.

Awards and Closing Statements

8:00 pm to 8:15 pm

Awards and Closing Statements