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The Eighth Annual

Osteopathic Poster Competition and Exhibition

Competitor and Exhibitor Abstracts



Biomedical/Clinical Competition Abstracts

B1 Title: Association between access to healthcare and regular sunscreen use in the United States**Authors:** John Allen, MS (OMS-II); Chavan Bhakti, MBBS, MPH; Zelalem Haile, PhD, MPH**Affiliations:** Ohio University Heritage College of Osteopathic Medicine, Dublin, Ohio

Introduction: Although regular sunscreen use has potential benefits, improper and inconsistent use may limit its effectiveness. **Objective:** The objective of this study was to examine the association between having a regular place for healthcare and regular sunscreen use. **Methodology:** This cross-sectional study used secondary data from the 2013-2016 National Health and Nutritional Examination Survey in the United States. The analytical sample was 6683 participants age 20-59 who had information for all variables assessed. The outcome was self-reported sunscreen use either "always" or "most of the time" when outside for at least 1 hour on a sunny day. **Results:** Overall, 28.9% of study participants reported using sunscreen regularly and 79.6% reported having a regular place for healthcare. Participants with a regular place for healthcare were more likely to report regular sunscreen use compared to those without a regular place for healthcare. After adjusting for potential confounders, there was a significant interaction between having a regular place for healthcare and education status on regular sunscreen use. For participants with more than high school education, the odds of using sunscreen were lower among those who did not have a regular place for healthcare. Subgroup analysis showed lower odds of regular sunscreen use for those whose regular place for care was an emergency room as compared to those whose regular place for care is a doctor's office or HMO. **Conclusions:** Access to and type of regular place for healthcare may contribute to sunscreen use. Context-specific strategies are needed to improve rates of sunscreen use.

B2 Title: Providers' willingness to communicate about weight control and links to patients' attitudes about and intentions to control their weight**Authors:** ¹Randi Amstadt, DO (PGY-3); ²Laura Hernandez, DO; Courtney Barrick, DO; ²Troy Hampton, DO; ¹Sandi Snyder, DO; ³Ann Kerr; ⁴Charee M. Thompson; ⁵Benjamin Bates, PhD**Affiliation:** ¹Cleveland Clinic, Cleveland, Ohio; ²Fairfield Medical Center, Lancaster, Ohio; ³Heritage College of Osteopathic Medicine, Athens, Ohio; ⁴College of Liberal Arts & Sciences, University of Illinois; ⁵Scripps College of Communication, Athens, Ohio

Introduction: Physician-patient communication influences patients' health-related attitudes and behaviors. If physicians are reluctant to communicate about weight control, patients may not behave in ways to control their weight. **Objectives:** This study assessed physicians' communication apprehension about weight control and its associations with patients' weight control attitudes and intentions. **Methodology:** Online surveys were completed by 16 family medicine residents from two medical centers in Ohio to assess their perceptions of a recent patient encounter about weight loss. Surveys were then completed by 308 patients of those physicians following outpatient family medicine visits. Patient surveys included assessment of weight-related attitudes, social norms, behavioral intentions, and perceived severity, as well as self-reported height and weight to calculate BMI. **Results:** Physician communication apprehension regarding weight control was negatively associated with patients' perceptions that controlling their weight helps avoid future health consequences of excess weight ($r = -.12, p < .05$), and patients' reported intent to control weight behavior ($r = -.14, p < .05$). Physicians also vary in their willingness to talk with patients about weight control ($M = 57.29, SD = 14.28, Range = 39-80$). **Conclusion:** Given that physicians' willingness to communicate about controlling weight can have effects on patients' attitudes and intentions to control their weight, it is important that providers emphasize empowering strategies to help patients feel like they *can* control their weight. Because some physicians are more reluctant than others to communicate about weight control, equipping them with skills to overcome their apprehension is important to medical education and training.

B3 Title: Ketamine vs Etomidate for Rapid Sequence Intubation in Critically Ill Patients**Authors:** Jordan Arends, BS (OMS-II); Vincent Kang, DO; Gabrielle Sabino, DO**Affiliation:** OhioHealth, Columbus, Ohio

Introduction: Physician-patient communication influences patients' health-related attitudes and behaviors. If physicians are reluctant to communicate about weight control, patients may not behave in ways to control their weight. **Objectives:** This study assessed physicians' communication apprehension about weight control and its associations with patients' weight control attitudes and intentions. **Methodology:** Online surveys were completed by 16 family medicine residents from two medical centers in Ohio to assess their perceptions of a recent patient encounter about weight loss. Surveys were then completed by 308 patients of those physicians following outpatient family medicine visits. Patient surveys included assessment of weight-related attitudes, social norms, behavioral intentions, and perceived severity, as well as self-reported height and weight to calculate BMI. **Results:** Physician communication apprehension regarding weight control was negatively associated with patients' perceptions that controlling their weight helps avoid future health consequences of excess weight ($r = -.12, p < .05$), and patients' reported intent to control weight behavior ($r = -.14, p < .05$). Physicians also vary in their willingness to talk with patients about weight control ($M = 57.29, SD = 14.28, Range = 39-80$). **Conclusion:** Given that physicians' willingness to communicate about controlling weight can have effects on patients' attitudes and intentions to control their weight, it is important that providers emphasize empowering strategies to help patients feel like they *can* control their weight. Because some physicians are more reluctant than others to communicate about weight control, equipping them with skills to overcome their apprehension is important to medical education and training.

B4 Title: Efficacy of Platelet Transfusion for Antiplatelet Reversal in Traumatic Intracranial Hemorrhage**Authors:** ¹Eric Baughman, BA (OMS-II); ²Josephine Hein; ³McKenzie Jackson; ⁴Timothy Wolff; ⁵Zachary Bernhard; ²Matthew Moorman; ²Urmil Pandya; ²Chance M Spalding, DO, PhD**Affiliations:** ¹Ohio University Heritage College of Osteopathic Medicine, Dublin, Ohio; ²OhioHealth Grant Medical Center, Division of Trauma and Acute Care Surgery, Columbus, Ohio; ³Northeast Ohio Medical University, Rootstown, Ohio; ⁴OhioHealth Doctors Hospital, Department of Surgery, Columbus, Ohio; ⁵West Virginia School of Osteopathic Medicine, Lewisburg, West Virginia

Introduction: As more US adults are prescribed antiplatelet medications, there is concern for increased mortality in these patients due to traumatic intracranial hemorrhage (tICH). Many institutions give these patients platelet transfusions for reversal effect, but little data justifies the practice. **Objectives:** Our aim was to assess the efficacy of platelet transfusion in tICH patients on pre-injury antiplatelet medication. **Methodology:** We retrospectively identified tICH patients on any pre-injury antiplatelet medication admitted between January 1, 2014, and June 30, 2018. Per institutional guidelines, patients admitted prior to September 2017 received platelet transfusion for reversal, and those admitted after were not given platelet transfusion. The primary outcome was mortality, with secondary outcomes of neurosurgical intervention, ICU length of stay, and total length of stay. Chi squared analyses and t-tests were used to compare the two groups. **Results:** The platelet transfusion group (449) and non-transfusion group (102) were demographically the same. Mortality and all secondary outcomes were not significantly different. Subgroup analysis of patients with subarachnoid hemorrhage (SAH) did reveal a significant difference in mortality ($p=0.022$) with no mortality in the transfused group and 6.25% mortality in the non-transfusion group. **Conclusion:** This early analysis indicates

that platelet transfusion may have an improved effect on mortality for patients with SAH on pre-injury antiplatelet medication. Analysis of our tICH data agrees with existing literature which does not support empiric transfusion of platelets for tICH patients on pre-injury antiplatelet medication. Further studies to validate this finding and assess hematoma expansion should be undertaken.

B5 Title: Identifying a Need and Knowledge Gap of Osteopathic Medicine in Pediatric Oncology Providers
Authors: Jennifer Belsky, DO, MS (PGY-4)¹; Melissa Rose, DO²; Joseph Stanek, MS¹; Cynthia Gerhardt, PhD²
Affiliation: Hematology/Oncology/BMT, Nationwide Children's Hospital, Columbus, Ohio; The Center for Biobehavioral Health, Nationwide Children's Hospital, Columbus, Ohio

Introduction: Children receiving chemotherapy often struggle with detrimental side effects including constipation, nausea, neuropathy, and decreased quality of life. As we continue to make great strides in medications to help minimize chemotherapy side effects, there remains a need for additional adjunctive supportive care. No literature has examined practitioner knowledge and implementation of osteopathic manipulative treatment (OMT) in the pediatric oncology population. **Objective:** To investigate a knowledge gap and potential need for osteopathic medicine in pediatric oncology. **Methods:** Twenty-one pediatric oncology providers at Nationwide Children's Hospital were approached for participation. Of those approached, 20 total providers completed the survey. Following a description and video of OMT, participants completed quantitative surveys and 1:1 semi-structured qualitative interviews. Interviews were audio-recorded and independently coded to determine thematic content. Descriptive statistics were used to summarize quantitative data. **Results:** We surveyed 20 oncology providers (7 male), including 15 attending physicians and 5 nurse practitioners with a median of 6.5 years of clinical practice (range: 1-24 years). All attending physicians were allopathic trained pediatric oncologists and had a varying degree of understanding of OMT. Providers supported further research to study the benefits of OMT, with 100% reporting a desire to have OMT available as a supportive care option. **Conclusions:** Pediatric oncology providers reported a need for better management of chemotherapy-associated side effects and an openness to non-pharmacological therapies with supporting data. These findings support the need to further investigate the safety and feasibility, as well as efficacy of OMT in the pediatric oncology clinical setting.

B6 Title: Increasing the Knowledge of Family Medicine Residents on Skin Cancer Screening Techniques: A Quality Improvement Project

Authors: Elizabeth Bentley, DO (PGY-3); Leslee Rice, DO; Morgan Efaw, DO
Affiliation: Marshall University, Huntington, West Virginia; Holzer Medical Center, Gallipolis, Ohio

Introduction: Total Body Skin Exam (TBSE) as a means of skin cancer screening is not usually part of the physical examination performed by primary care providers (PCPs). Typically, only exposed areas relevant to the physical exam are evaluated. While over half of PCPs feel that skin cancer screening is 'extremely' important, skin cancer screening is not common in the primary care setting in the United States, likely due to time constraints as well as the lack of emphasis and training in medical school and residency. **Objectives:** This project identified medical student and family medicine resident knowledge, skills and deficiencies regarding TBSE. **Methodology:** Family Medicine residents and medical students were administered a pre-test to identify confidence and skill levels in performing TBSE, diagnosis, treatment and further management of common skin lesions. A lecture series was developed with focus on the identification, management and treatment of common benign and malignant skin lesions. A post-test was administered to determine if confidence and skill level increased as a result of the lecture series. **Results:** Our data indicates self-perceived improvement in confidence and experience with whole body skin examinations after our resident driven lecture series and skin cancer screening community event. **Summary/Conclusion:** We believe further lectures and community screenings offer a meaningful way to improve comfort level and efficiency in performing TBSEs. Early detection can reduce both financial and disease burden for the patient (as many lesions can be treated in the PCP office without referral to a specialist).

B7 Title: Assessing Fatigue Recovery in Trauma Surgeons Utilizing Actigraphy Monitors
Authors: ^{1,2}Zachary Bernhard, MBA (OMS-II); ¹Timothy Wolff, DO; ¹Brittany Ljsjak, PA-C; ^{1,3}Irina Catanescu, DO; ^{1,3}Eric Baughman (OMS-II); ¹Matthew L Moorman, MS, FACS; ¹Chance M Spalding, DO, PhD
Affiliation: ¹OhioHealth Grant Medical Center, Columbus, Ohio; ²West Virginia School of Osteopathic Medicine; ³Ohio University College of Osteopathic Medicine, Athens, Ohio

Introduction: For over 20 years, relationships between mental fatigue and physical performance have been extensively researched by the US military and other high-risk occupations. This is a growing area of interest within medicine, yet there remain few investigations pertaining to surgeons. **Objectives:** This study sought to quantify sleep to assess impact upon fatigue and recovery time following 24-hour call among trauma surgeons to serve as a starting point in optimizing staffing and scheduling. **Methodology:** This was a prospective analysis at an urban, Level 1 trauma center. Readiband actigraphy monitors (Fatigue Science, Vancouver, BC) incorporating a validated Sleep, Activity, Fatigue, and Task Effectiveness Model, tracked sleep/wake cycles over a 30-day period. Recovery time was measured as time during the post-call period for surgeons to reestablish his/her pre-call 24-hour mean alertness. Three groupings were established based on recovery time: rapid (0-6 hours), intermediate (6-18 hours), and extended (>18 hours). ANOVA analysis then compared on-call, post-call, and total sleep to recovery time for every call shift. **Results:** Twenty-seven 24-hour call shifts among 8 trauma surgeons (6 males, 2 females) were analyzed. Statistical significance ($p < 0.05$) was found when correlating recovery groups to on-call sleep ($p < 0.0001$; $R^2 = 0.62$), post-call sleep ($p < 0.0001$; $R^2 = 0.56$), and total sleep ($p = 0.001$; $R^2 = 0.43$). **Conclusion:** This early analysis indicates statistical significance exists between sleep achieved on-call and post-call, and recovery for trauma surgeons. These results show promise as a viable method to investigate optimizing trauma surgeon staffing and scheduling. Further studies validating these findings and evaluating impacts of additional sleep components should be undertaken.

B8 Title: The effects of a wellness program introduction on Emergency Medicine Resident Physician Burnout
Authors: ¹Teresa Bigley, DO, ²Jaime Lent, DO, ²Joshua Clore, DO, ²Dan Breece, DO
Affiliation: ¹Memorial Health System EM Residency, Marietta, Ohio; ²Department of Emergency Medicine, Memorial Health System, Marietta, Ohio

Introduction: Emergency physicians experience professional burnout at a rate greater than 3 times that of their non-emergency physician peers. This statistic implies that further efforts should be made to identify new ways to incorporate wellness into residency training. **Objective:** A new wellness program was instituted within one rural Emergency Medicine Residency. The program consisted of one 6 hour orientation kickoff and twelve 15 minute wellness activities over the 2017-2018 academic year. The goal was to reduce burnout/ improve wellness with minimal impact on didactics and duty hours. **Methodology:** The Maslach Burnout Inventory TM- Human Services Survey (MBI- HSS) was used to Assess Burnout in July 2017 and repeated in July 2018 after 1 year of resident wellness activities. 13 residents participated in the initial survey, 12 participated in the follow up survey. **Results:** There was no significant change in emotional exhaustion (Mean 0.1833, Std. Deviation 0.8167,

CI 95%). There was no significant change in feelings of depersonalization (Mean 0.1833, Std. Deviation 1.2194, CI 95%). There was no significant change in sense of personal accomplishment (Mean 0.0167, Std. Deviation 1.2791, CI 95%). **Conclusion:** Our resident wellness program did not objectively improve resident wellness. More specifically, it had no statistical impact on depersonalization, emotional exhaustion, or personal accomplishment. Resident wellness is a truly multifaceted issue, not easily measured or improved. The outcome of this study suggests interventions intended to truly impact resident wellness should incorporate more than short monthly bursts of educational experience.

B9 Title: A Randomized, Controlled, Patient Blinded Study of the Use of Liposomal Bupivacaine in Thoracolumbar Spinal Fusions
Authors: ¹James Brewster, DO (PGY-4); ^{1,2}Paul Eichenseer, DO; James Brewster, DO; ²Jeffrey Cochran, DO; ¹Daryl Sybert, DO
Affiliations: ¹Mount Carmel New Albany Surgical Hospital, New Albany, Ohio; ²Affinity Medical Center, Massillon, Ohio

Introduction: Liposomal bupivacaine (Exparel) has an uncertain impact on patient post-operative course in spine surgery. No higher level studies exist to determine the effect of liposomal bupivacaine with postoperative pain control in regards to patient immediate postoperative functional outcomes with short segment (2-4 level) thoracolumbar fusions. **Objectives:** To determine if liposomal bupivacaine results in decreased length of hospital stay, increased distance of first ambulation, decreased visual analogue scale (VAS) pre and post-ambulation pain scores, and decreased narcotic utilization. **Methodology:** One hundred thirteen patients undergoing thoracolumbar spinal fusion (mean age 62.7 years) by 2 spinal surgeons were prospectively randomized to receive pre peri-incisional injections of liposomal bupivacaine or no injection. Post-operative first ambulation distance, pre and post-ambulation visual analog pain scale (VAS), narcotic usage as morphine equivalents per day (MEUs/day), and hospital length of stay were collected. The study was performed independent of industry. **Results:** Patients receiving liposomal bupivacaine had longer length of stay compared to the control group (*mean 2.05 vs. 2.51 days, p=0.04*). No significant difference was found in the control group and experimental treatment group in VAS pain scores prior to first ambulation (*mean 5.75 vs. 5.52, p=0.66*), VAS scores after first ambulation (*mean 5.75 vs. 5.75, p=0.99*), MEU/day (*mean 57.7 vs. 48.9 morphine equivalents, p=0.25*). **Summary/Conclusions:** The effect of liposomal bupivacaine following thoracolumbar spine fusion does not appear to offer any significant benefits in terms of postoperative VAS pain scores prior to and after first ambulation, morphine equivalents of narcotic usage per day, or ambulation distance.

B10 Title: Growth hormone and the glomerular podocyte: Studies of podocyte specific growth hormone receptor gene deletion in mice
Authors: Alison Brittain DO, PhD (OMS-II); Ryan Woodyard¹; Reetobrata Basu¹; Yanrong Qian; Silvana Duran-Ortiz¹; Jonathan Young¹; Elizabeth Jensen¹; Darlene Berryman, PhD, RD, LD^{1,2}; Edward List; John Kopchick, PhD^{1,2}
Affiliations: ¹Ohio University, Athens, Ohio, ²Heritage College of Osteopathic Medicine, Athens, Ohio

Introduction: Previous research has suggested a role for growth hormone (GH) in the development of kidney disease. Evidence of increased glomerular size and sclerosis in bovine GH (bGH) overproducing animals suggests that excess GH action may cause or exacerbate glomerular damage. Within the glomerulus, the podocyte plays the role of forming a filtration barrier called the slit diaphragm. This cell is known to be dysfunctional in many models of nephropathy and is also a direct target of GH. **Objectives:** To explore the mechanisms by which GH impacts the glomerulus, we have developed a transgenic mouse, the podocyte-specific GH receptor gene-disrupted mouse (podGHR^{-/-}). These mice were generated using Cre-Lox transgenic methods. To examine the effects of high GH levels on the podocyte, these mice were crossed with bovine GH (bGH) overproducing mice and studied at several time points over the course of a year. **Methodology:** Glomerular filtration rate (GFR) testing, glucose and insulin tolerance testing, body composition analysis, and urine & serum analysis were performed on all mice, along with histological analyses. **Results:** Male podGHR^{-/-} mice with or without bGH overexpression had increased GFR at 54 weeks of age. Both male and female podGHR^{-/-} mice exhibited significantly decreased glomerular deposition by several measures. **Conclusion:** Our results suggest a role for podocyte GH activity in the regulation of GFR in the aging and diseased kidney, as well as a role for GH in directing the deposition of collagen and glycosaminoglycans in glomerulus via the podocyte.

B11 Title: Magnetic Resonance Cholangiopancreatography (MRCP) for biliary stone disease in a large, tertiary care referral center: An essential tool or expensive delay in management?
Authors: Aya Bsatee, BS (OMS-II); Clint Ingersol, MD; Max Kopitnik, MD
Affiliations: ¹Ohio University Heritage College of Osteopathic Medicine, Dublin, Ohio

The preoperative management of choledocholithiasis remains a topic of strong debate as a patient is undergoing laparoscopic cholecystectomy. RUS and LFTs are uniformly advocated, however, the timing and/ or use of EUS, magnetic resonance, or endoscopic retrograde cholangiopancreatography (ERCP) to examine common bile duct stone are not well identified. Currently, there are two school of thoughts in the American Journal of Surgery regarding management of choledocholithiasis. The first one suggests proceeding with laparoscopic cholecystectomy with intraoperative cholangiogram, arguing that MRCP prolongs hospital stays and has high false negative rates as a non-invasive tool. While the second one argues MRCP does not affect the length of stay and significantly impacts the management of patients who would have undergone ERCP. We hypothesize that reliance on MRCP in these patient results in a longer hospital stay and increased hospital costs, without a significant impact on patient outcome. The study design is a retrospective cohort study that included all patients ages 18-79 presenting to RMH emergency department between 2014 and 2017 with an uncomplicated biliary stone disease and suspected choledocholithiasis. Out of 3435 patients, only five hundred patients were included in the study. The length of stay was longer among patients that underwent both MRCP and ERCP vs. patients that did not (*p=0.005*). The total cost was significant among patients that underwent ERCP alone vs. patients that underwent both MRCP and ERCP (*p<0.05*). It was concluded that the length of stay was prolonged in patients undergoing preoperative MRCP, and the hospital costs were increased in patients undergoing both MRCP and ERCP.

B12 Title: Recurrent High Utilizers and Visit Time in the Grant Medical Center Emergency Department
Authors: ¹Jonathon Burnes, BS (OMS-II); ²Ean Bett, DO
Affiliations: ¹Ohio University Heritage College of Osteopathic Medicine, Athens, Ohio; ²OhioHealth, Columbus, Ohio

Introduction: Over the years there has been increasing research into Emergency Department (ED) "high utilizers", but little research has been done to determine the prevalence of recurrent high utilizer patients as well as the distribution of their arrival times in the ED. **Objectives:** The aims of the study were: 1.) determine the prevalence of repeat high utilizers of the ED in a three-year time span and examine their demographic factors and 2.) determine the distribution of ED visits throughout the day in the high utilizer population. **Methods:** All patients seen at the ED of Grant Medical Center between 2015-2017 were analyzed via a retrospective chart review to determine if they were classified as a high utilizer (four or more visits in a 12-month period), if that classification was consistent over the three-year period and their arrival time in the ED. **Results:** The results show that there were 616 patients who were recurrent high utilizers over the three-year period. In total they

resulted in 17,727 combined visits which is approximately 29 visits per patient. Other significant findings were 54.2% of the patients were female with an average age of 44.9 years and the highest percentage of visits occurring between 2:00-8:00 P.M. **Summary/Conclusion:** Recurrent high utilizers resulted in approximately 8.20% of all ED visits and are more likely to be female and have an average age of 44.9 years. Additionally, it shows that over half of ED visits by recurrent high utilizers occur between 8:00 A.M. and 8:00 P.M.

B13 Title: The Moderating Role of Race/Ethnicity on the Association between Insurance Status Timely Receipt of Prenatal Care among Low-income Pregnant Women in Central Ohio

Authors: George Chilupe, BS (OMS-III); Zelalem Haile, PhD, MPH; Chavan Bhakti, MBBS, MPH

Affiliation: Ohio University Heritage College of Osteopathic Medicine Student, Columbus, Ohio

Introduction: Timely receipt of prenatal care is essential for optimal maternal and infant health outcomes. Low-income pregnant women are disproportionately affected by access to health care services and are more likely to experience health problems. Studies examining the moderating role of sociodemographic characteristics on the association between insurance status and timely receipt of prenatal care among low-income pregnant women are currently lacking. **Objective:** To examine the associations between insurance status and timely receipt of prenatal care after adjusting for potential confounders. **Method:** A cross-sectional study of low-income pregnant women (n=6302) enrolled in the STEPOne for Pregnancy in Ohio. Chi-square test and multivariable logistic regression performed. **Results:** Overall 4,836(76.7%) had Medicaid, and 587 (9.3%) had private insurance, 4,613 (73.2%) had a timely receipt of prenatal care. In the multivariable model, a statistically significant interactions were found between race/ethnicity and insurance status on timely receipt of prenatal care. For non-Hispanic white and non-Hispanic black women, those with private insurance are more likely to receive timely prenatal care compared to those on Medicaid [aOR 1.52, 95% CI (1.08-2.17); P<0.001] and [1.87 (1.24-2.84); p =0.001], respectively. On the other hand for non-Hispanic white, non-Hispanic black and Other race/ethnicity group women who were uninsured were less likely to receive a timely prenatal care compared to women on Medicaid [0.58; (0.41 - 0.83); p<0.001], [0.62 (0.42-0.92); p<0.001], and [0.47; (0.36-0.68); p<0.001], respectively. **Conclusion:** Race/ethnicity moderates the association between insurance status and timely receipt of prenatal care among low-income pregnant women.

B14 Title: Describing Degree of Resident Burnout by Program at OhioHealth Doctors Hospital: A Quality Improvement Study

Authors: Susan Chloe, DO (PGY-3); Kerry Bellew, PhD

Affiliations: OhioHealth Doctors Hospital Family Medicine, Columbus, Ohio

Introduction: Burnout is a state of mental and physical collapse related to work, stressors, and inadequate coping skills. It is characterized by emotional exhaustion, depersonalization, and reduced personal accomplishment. Burnout has been shown to be prevalent among the medical profession. Residents are typically associated with the most burnout and has gained significant attention the past several years. Due to this, Accreditation Council for Graduate Medical Education (ACGME), has created an addendum to their resident wellness protocol in July 2017, to aim for decrease burnout rates. **Objective:** Describe burnout level amongst the residents in different programs of OhioHealth Doctors Hospital. Identify if demographics or knowledge of wellness (put forth in compliance with ACGME) within the hospital system correlate with rates of burnout. **Method:** The study utilized a modified version of the Maslach Burnout Inventory (MBI) to assess the 3 dimensions of burnout evaluation. The studies also collected demographic and individual resident characteristics using a study-specific survey and the Patient Health Questionnaire-9. **Results:** Overall, burnout scores will be summarized with means, standard deviations, medians, and ranges for the MBI and also will be broken down by program/specialty. The results of this study will be presented at the conference. **Summary /conclusion:** ACGME's addendum to the wellness protocol was instituted to decrease resident burnout. It is important that educators are aware of burnout and consider incorporating relevant interventions for resident wellness. The results of this study will be presented at the conference.

B15 Title: An Appreciation for the more Common Patterns of Central Venous Catheter Misplacement

Authors: Shawn Clark (PGY-4); Nicole Ramon, PhD

Affiliations: Western Reserve Hospital, Cuyahoga Falls, Ohio

Introduction: Regardless of skill of the operator, and the use of ultrasound guidance during placement, central venous catheter placement can result in mispositioning. Undiagnosed CVC mispositioning can be associated with significant morbidity and mortality. **Objective:** The goal of this review is to provide examples of applied anatomy and practical management for complications of misplaced CVCs. **Methodology:** Literature review of PubMed, textbook review, and expert opinion. **Results/Summary/Conclusion:** The mechanisms of CVC malposition are multifactorial and can lead to a host of morbidity and mortality complications which can, for the most part, be avoided with proper care in placement, recognition of malposition, and prompt intervention in the setting of complications.

B16 Title: Injuries among roller derby athletes and their beliefs about osteopathic manipulative treatment

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Affiliation: ¹Ohio University Heritage College of Osteopathic Medicine, Athens, Ohio; ²Ohio University Heritage College of Health Sciences and Professions, Athens, Ohio

Introduction: Roller derby is growing in popularity with 30,000 players participating in 400 full member leagues internationally. This full contact sport has high injury rates, ranging from joint sprains to concussion. Use of osteopathic manipulative treatment (OMT) could drastically decrease injuries and improve players' performance. Little health-related research on derby exists. Players' perceptions of osteopathy are unknown. More information could better guide primary care for these athletes. **Objective:** Understand athletes' beliefs and behaviors regarding pain management. Assess derby players' knowledge and attitudes about OMT. **Human Subjects Review:** Approved via expedited review. Design: International anonymous survey with open- and closed-ended questions using snowball sampling. Setting: Disseminated online. Shared through social media sites used by derby players and teams. Participants are adults active with roller derby. Junior derby members and non-active derby players were excluded. **Intervention/Instrument:** A 28-item survey was disseminated online requesting information on injuries, pain management techniques, and OMT knowledge. Main **Outcomes Measured:** Data will help (1) create a measure of common injuries occurring with roller derby, (2) identify opportunities to improve how athletes' manage pain, and (3) gauge perceptions of OMT. **Results:** This population exhibits high prevalence of ankle, knee, and shoulder injuries that may increase usage of pain medications and naturopathic remedies. Roller derby athletes are also unfamiliar with OMT, but interested in its use. **Conclusions:** Derby attracts a variety of individuals who experience high rates of injury and use a variety of pain management strategies. There is high opportunity to intervene with OMT, education, and evidence-based practices.

B17 Title: How LARC knowledge, training, and provider concerns predict referrals and placement: A study of providers in Ohio
Authors: ¹Maggie Dade, BS (OMS-IV); ¹Jane Broecker, MD; ²Charee Thompson, PhD
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Introduction: Unintended pregnancies are one of the main threats to overall health of both women and infants, and socioeconomic stability within Ohio. Though long acting reversible contraceptives (LARC) are highly efficacious and long acting, they are often underutilized.
Objective(s): The purpose of this study was to provide a more nuanced understanding of the barriers to LARC placement by investigating how knowledge, training, and concerns are related to one another, and how they predict LARC referrals and placement. **Methodology:** We recruited 224 providers from across the state of Ohio who completed an online survey and were compensated with an Amazon gift card for their participation. Data analyses were conducted in SPSS 25.0 and included correlations, odd-ratios, and independent samples t-tests. **Results:** LARC knowledge, training and provider concerns are correlated with one another. LARC training positively predicts placement and negatively predicts referral, when other barriers (knowledge, provider concerns) are considered simultaneously. Of providers who are trained to place implants, 20.3% said they refer implant placement, and 18.5% said they did not place implants. Of providers who are trained to place implants, 27.1% said they refer IUD placement, and 28.1% say they did not place IUDs. Those who do not place LARCs and those who refer them report greater barriers to LARC placement than those who do place. **Conclusion(s):** LARC knowledge, training, and provider concerns as barriers to LARC placement are interdependent. Even when providers are trained to place LARC, a significant portion refer and do not place them.

B18 Title: Improving Obesity Quality Measures for CMS in an FQHC
Authors: Megan Dorsack, PhD (PGY-II); Gretchen Polinski, PhD (OMS-II); Jacob Farber, PhD (OMS-II)
Affiliation: Grandview Medical Center, Kettering, Ohio

Centers of Medicare and Medicaid quality performance benchmarks were created to standardize the measurement of health care quality across state Medicaid programs and facilitate the use of the measures for quality improvement. Achievement of these benchmarks in a federally qualified health center is a continually evolving process and a seemingly daunting task to many health care providers. The adult set of benchmarks is comprised of 26 measures across six domains of care: prevention and health promotion, management of acute conditions, management of chronic conditions, family experiences of care, care coordination/care transitions and availability. Through computer data collection, it was determined that our facility was falling short on meeting a prevention and health promotion benchmark: Body Mass Index (BMI) Screening and Follow Up. A quality improvement team was established to determine how we were currently performing this benchmark with concerns of this being related to time constraints, inefficient electronic medical records or were our providers simply unaware of the necessary requirements needed to meet this benchmark. The team proposed that developing a standardized process for meeting this benchmark could improve our overall compliance for BMI screening and follow up while still remaining time efficient for staff and providers.

B19 Title: Student perspectives on the effects of the Heritage Colleges postbaccalaureate program on their first year of medical school
Authors: Tiffany Downs, BS (OMS-II); Lisa Forster, MS; Rosellen Roche, MD, PhD, FHEA
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Introduction: The Heritage College houses an invitation only postbaccalaureate (post-bac) program aiming to increase readiness of underrepresented minority (URM) students for entrance into Ohio University's medical school (HCOM). With vast diversity in structure and delivery of post-bac education nationally, HCOM's program is unique because it is scholarship funded and guarantees admittance with a minimum 3.0 cumulative GPA. Many case studies demonstrate that post-bac programs increase medical school matriculation for URM students. However, little agreement exists on what post-bac framework works best. **Objective:** To understand the perceptions, attitudes and beliefs of first year medical students who completed HCOM's post-bac program about its effect on their education and preparedness for medical school. **Human Subjects Review:** Expedited Review. Design: Qualitative research utilizing in-depth interviews. Setting: Ohio University. 15 participants from HCOM's three campuses are expected to be interviewed based on eligibility: Age 18-90, a first-year med student, completed the HCOM post-baccalaureate program prior to entering medical school. **Intervention/Instrument:** An interview guide for in-depth interviews. **Anticipated Results:** Key factors, such as scholarship funded participation, guaranteed acceptance if GPA is above 3.0, of the post-bac curriculum will emerge as being the most beneficial to students and their feelings of preparedness. **Conclusions:** HCOM Admissions can use the data to assess the post-bac curriculum and support the college's mission of increasing physician workforce diversity. The information can be used to support future research about programmatic factors helping make post-bac programs successful.

B20 Title: Identifying barriers in PCC patients referred to food pantries associated with Mid-Ohio Foodbank in Columbus, Ohio
Authors: Danielle Dukes, MS, MBA, BS (OMS-III); Brooke Smith, BS (OMS-II); David Strawhun, MA, BA (OMS-II); Max Farenwald, BS (OMS-II); Sharon Casapulla, EdD; Francis Blais, DO
Affiliations: Ohio University Heritage College of Osteopathic Medicine, Columbus, Ohio

Physicians Care Connection (PCC) is a free clinic for uninsured patients in Franklin County. Patients are screened for food insecurity and, if identified as food insecure, connected to the nearest Mid-Ohio Foodbank (MOF) pantry. However, only 52% of the patients so identified actually utilize their referred food pantry for assistance. The objective of this study is to investigate why referred patients do not seek local food resources available to them. Patients identified as food insecure are registered for the Food Prescription Program and entered into MOF's Pantrytrak database. As a member of the Food Prescription Program, patients are able to visit the nearest MOF pantry in their neighborhood and receive free produce at least once weekly for all family members. We hypothesize that patients face barriers that hinder their ability to take advantage of the nutritional resources at the referred food pantry, peer-reviewed literature has documented such barriers in various contexts. This study seeks to identify specific barriers within the food insecure patient population of the PCC, the largest free clinic in Central Ohio. To identify these barriers, thirty-minute patient interviews will be conducted, audio recorded, transcribed, and coded to uncover and analyze thematic similarities within this patient population. Results of this study will be shared with the MOF and PCC in order to implement processes and procedures to help eliminate barriers that currently prevent food insecure patients from utilizing the food resources available in their local community.

B21 Title: Exploring Factors Influencing URM Performance on COMLEX-1**Authors: Rachelle Dulan, BS (OMS-IV)****Affiliations: Ohio University Heritage College of Osteopathic Medicine, Athens, Ohio**

Purpose: Numerous studies have been conducted to evaluate why minority students tend to score lower on standardized examinations in comparison with their non-minority peers. These studies have focused on exams ranging from the ACT, SAT, MCAT, to the LSAT. While many of these studies revealed common themes, none have investigated minority performance on the College of Osteopathic Medicine Licensure Examination (COMLEX-1). This project was designed to explore various factors that impact underrepresented minority student (URM) performance on the COMLEX-1. The results from this study were used to generate a quality improvement proposal to the university. The quality improvement proposal was designed to provide the institution with practical strategies for the support of future URM students surrounding COMLEX-1 preparation and completion. **Methods:** The project was conducted at an osteopathic medical school in the Midwestern United States. A total of 145 Participants were recruited for the study on the basis of: 1) Belonging to an underrepresented minority group, as defined by the American Association of Medical Colleges (AAMC): African American, Mexican-American, Native American (i.e., American Indians, Alaskan Natives, Native Hawaiians, and mainland Puerto Ricans) 2) Having graduated from this particular osteopathic medical school between the years of 2015 and 2020 3) Having attempted the College of Osteopathic Medicine Licensure Examination-1 (COMLEX-1) Data was analyzed using mixed methods in order to evaluate both qualitative and quantitative data. **Results:** Analysis of quantitative data showed that on average, URMs score 57.5 points lower on COMLEX-1 when compared to their non-URM peers. The average URM MCAT score for students admitted between 2011-2016 was 23.4 compared to a non-URM MCAT score of 27.2. When comparing performance between URM's and non-URM's on COMLEX-1 and the MCAT, the data indicates that there is a stronger positive correlation between URM MCAT and COMLEX-1 scores when compared with the scores of non-URM students. While the quantitative data provides empirical evidence of an existing disparity, the qualitative data presents anecdotal information about the underlying causes for the disparities between URM and non-URM performance based on factors ranging from familial education, socio-economic status to recurring societal barriers experienced by students.

B22 WITHDRAWN**B23 Title: Education as a Predictor of Health Outcomes in West Virginia: A WVU Urology Clinic Experience****Authors: Farrah El-khatib, BS (OMS-II); Dale Riggs; Barbara Jackson; Stanley Zaslau, MD; Stanley Kandzari MD****Affiliations: West Virginia School of Osteopathic Medicine, Lewisburg, West Virginia**

Introduction: West Virginia is ranked 2nd in the nation for obesity, 47th for socioeconomic status, and has one of the highest rates of cancer in the nation. Many lifestyle factors can contribute to quality of life and health for people in this state. This study offers valuable information to West Virginians and people everywhere regarding education levels and healthy living factors. **Methods:** Surveys were administered in the WVU Urology clinic. It was explained to the patients that their participation was voluntary and their responses would be confidential and would not be part of their medical records. The surveys contained demographic, socioeconomic, and lifestyle information, prevalence of common urological conditions, male and female sexual function indexes. For this report we explored the relationship between education level, cancer rates, and tobacco and alcohol usage. **Results:** A total of 1043 surveys were collected (82 less than High School, 346 High School Graduate, 266 Some College, and 349 College Graduate). Individuals who completed less than high school, typically have a higher rate of cancer and higher percentage of tobacco usage. As the level of education increased, the rates of cancer and tobacco usage decrease drastically. In contrast, the numbers show that those who have completed college have a higher rate of consuming alcohol. **Conclusion:** The level of education plays a significant role in the incidence of both cancer and the use of tobacco. People who have lower levels of education may have issues such as lack of access to healthcare or lack of education about healthy lifestyles. Increased education for the residents of West Virginia will provide not only socio economic benefits but should also provide benefits to their health as well.

B24 Title: Self-Efficacy Predicting Self-Care of Type 1 and Type 2 Diabetics**Authors: ¹Kevin Gross, DO (PGY-2); ²Elizabeth Beverly, PhD; ¹Morgan Gordon, DO****Affiliation: ¹OhioHealth O'Bleness Hospital, Athens, Ohio; ²Ohio University Heritage College of Osteopathic Medicine**

Background: Diabetes prevalence continues to rise, particularly in Appalachian Ohio, with 1 in 5 Southeast Ohioans identifying as having diabetes. Management of diabetes requires many self-care behaviors. We as physicians want to empower our patients that lifestyle changes have a positive effect in reducing diabetes morbidity. Inspired by Osteopathic Principles of interconnectedness of mind, body, and spirit, we attempted to demonstrate that self-efficacy (mind, soul), or belief in control over one's circumstances, of people with type 1 or 2 diabetes was a significant predictor of diabetes self-care behaviors (body). **Objective:** The purpose of this study was to evaluate the impact of self-efficacy predicting self-care of type 1 and type 2 diabetics. **Methods:** We performed ANOVA analysis to examine if self-efficacy, or confidence in diabetes control, predicts self-care of type 1 and type 2 diabetes with a 19-question self-care inventory. Controlled for age, gender and type of diabetes. **Results:** Of the 212 individuals invited to participate in the cross-sectional survey study, 164 completed the survey. Statistical significance was found (t-value=10.312, p=0.0001) between confidence in diabetes and self-care behaviors (self-care inventory). Additionally, in controlling for type of diabetes, type 1 diabetics performed more self-care than type 2 diabetics (t=-3.535, p=0.001). No statistical significance was found between diabetes self-care and age (t-value=0.208, p=0.835) or gender (t-value=-0.803, p=0.423). **Conclusions:** This study demonstrates self-efficacy predicts diabetes self-care behaviors. It also demonstrate that individuals with type I diabetes has more confidence in performing self-care than those with type II diabetes. This shows we need to focus efforts on empowering those with type II diabetes to have better self-care confidence. In this study, highly educated individuals were used. We recognize this as a limitation of the study.

B25 WITHDRAWN**B26 Title: Pseudolaric Acid B (PAB) Sensitizes Gemcitabine Efficacy Toward Pancreatic Cancer Cell Death by Targeting p53/P-gp Signaling Pathways****Authors: Shaun Hansel, BS (OMS-II); Amber Crawford, Kartick Parmanik, PhD****Affiliation: University of Pikeville, Kentucky College of Osteopathic Medicine, Pikeville, Kentucky**

Introduction: The major obstacle to pancreatic cancer treatment is multi-drug resistance. Pseudolaric acid B has shown promise as an anticancer agent in cancer models. PAB reverses multi-drug resistance in gastric cancer through decreased expression of P-glycoprotein (P-gp) and activation of ATM/p53 pathways. **Objectives:** Determine if PAB reverses the gemcitabine-resistance by regulating the P53/P-gp axis in pancreatic cancer cells. **Methodology:** Panc-1 cells were used. Cell viability measured by MTT assay with PAB and gemcitabine alone and combination for 48hr and 72hr. Apoptosis assay: Cells treated with PAB, gemcitabine, or DMSO. Combination treatment cells pretreated with

PAB for 24h before gemcitabine treatment. Dead and dying cells measured by flow cytometry. Immunoblots assay: Cells exposed to PAB, Gemcitabine, and combination. Protein expression determined by western blot. **Results:** IC50 of PAB and Gem is 1.1 μ M and 0.274 μ M in 48hr and 0.821 μ M and 0.170 μ M in 72hr. The PAB/Gem combination treatments of 0.5 μ M and 1 μ M decreased Gem IC50 45% and 50%. Combination treatment of 1 μ M PAB and 200 nM gem showed ~2.6 fold apoptosis increase compared to control. Combination treatment induced apoptosis by decreased expression of PARP, increased expression of p53, and decreased expression of P-gp levels induced by Gem. **Conclusion:** PAB treatment was shown to decrease cell viability and increases the efficacy of gemcitabine toward cell death. Combination of PAB/Gem increased apoptosis, decreased P-gp expression, and phosphorylated p53 in Panc-1 cells. PAB sensitizes pancreatic cancer cells to gemcitabine, and gemcitabine combination might be a promising chemotherapy for pancreatic cancer.

B27 Title: Computable Phenotype for Mild Cognitive Impairment from the Mayo Clinic Study of Aging
Authors: ¹Chelsea Herbert, BS (OMS-II); ²Joyce E. Balls-Berry, PhD, MPE; ²Alex Alexander, MPA, MBA; ³Michael W. Weiner, MD; ³Rachel Nosheny, PhD; ²Ronald C. Petersen, MD, PhD
Affiliation: ¹Ohio University Heritage College of Osteopathic Medicine, Dublin, Ohio; ²Mayo Clinic, Rochester, Minnesota; ³University of California, San Francisco, California

Background: Mild Cognitive Impairment (MCI) has been associated with a higher risk of developing dementia. **Objective:** To develop a clinical phenotype for MCI based on the Mayo Clinic Study of Aging (MCSA) that may be applied to the Brain Health Registry (BHR) cohort at the University of California San Francisco (UCSF). **Methods:** We included 112 participants, aged 75-95 years, from the Mayo Clinic Study of Aging (MCSA). We selected persons from the database who had the following characteristics: diagnosis of MCI, 12-item Everyday Cognition (ECog-12), Clinical Dementia Rating (CDR), and Functional Activities Questionnaire (FAQ) and CogState Brief Battery. ECog-12 measures mild functional changes related to activities of daily living: memory, language, visual-spatial and perceptual abilities, executive functioning (planning, organization and divided attention). CDR is an informant questionnaire that measures everyday function: memory, orientation, judgement and problem solving, community affairs, home and hobbies and personal care. FAQ is an informant questionnaire that measures impairment of instrumental activities of daily living. CogState domains assess psychomotor function, attention, working memory and visual learning. **Results:** Bivariate analysis and logistic regression were used to compare participants that were cognitive normal to those with MCI. ECog_12item and CogState One Back showed significant distinction between CN and MCI patients ($p < 0.5$), whereas CogState Detection and One Card Learning were highly significant ($p < .0001$). **Conclusion:** Preliminary results illustrate a difference among the cognitive measures (CN and MCI) with the exclusion of FAQ. Future analysis will include comparing MCI subjects to controls and those with dementia.

B28 Title: Preclinical Osteopathic Medical Students' Attitudes toward Nutrition in Patient Care
Authors: ¹Kaitlin Hicks, DO (PGY-1); ²Timothy Law, DO; ²Elizabeth Beverly, PhD
Affiliations: ¹OhioHealth O'Bleness Hospital, Athens, Ohio; ²Ohio University Heritage College of Osteopathic Medicine, Athens, Ohio

Introduction: Awareness of proper nutrition in the prevention and progression of chronic illness has not been adequately demonstrated in the education of preclinical medical students. Physicians in our society are often viewed as one of the primary resources of nutritional counseling. As future physicians, medical students must recognize the importance of nutrition education and its role in patient care. **Objective:** The purpose of this study was to assess first and second year osteopathic medical students' attitudes about nutrition in patient care. **Methods:** In this descriptive, cross-sectional study, we conducted independent sample t-tests to compare nutrition attitudes by gender, age, community of origin, class year, medical campus, and plans to pursue primary care. **Results:** A total of 251 students (mean age=24.8 \pm 3.4 years, 50.4% (n=133) identified as female, 74.6% (n=197) white, 44.7% (n=118) from rural or small town, 52.7% (n=139) OMS I, 66.3% (n=175) main campus, 40.5% (n=107) plans to pursue primary care) completed the survey for a response rate of 59.1%. The majority (71.3%, n=171) of participants felt nutrition counseling was the responsibility of primary care physicians. Further, 68.3% (n=166) rated nutrition education as very important. Participants average a 91.1 \pm 11.5% on clinical behavior attitudes toward nutrition. Importantly, these attitudes did not differ by gender, age, community of origin, class year, medical campus, or plans to pursue primary care. **Conclusions:** Medical students recognized the importance of nutrition education in the curriculum. Their positive attitudes toward nutrition indicated that they understood the value of nutrition counseling and referrals to registered dietitians.

B29 Title: A Retrospective Comparison of MRI and Manual Inversion Stress Xray Studies in the Diagnosis of Lateral Ankle Instability
Authors: Pearson Huggins, BS (OMS-II)¹; Nicholas Cheney, DO²; Joseph Long, BS (MS-2)³; Conner Yancey, BS (MS-2)³; Adam Rabe BS (OMS-II)¹; Brent Whitehead, BS (OMS-II)¹; Timothy Law, DO, MBA¹; Kaitlyn Schimmoeller, PAC²
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Chronic lateral ankle instability (LAI) is a common cause of ankle pain that is diagnosed by clinical examination and advanced imaging if needed. Currently, MRI imaging is considered to be superior to stress radiographs. This study compares the results of MRI and manual inversion stress radiographs to assess the accuracy of each modality in the diagnosis of LAI. We believe that stress radiographs may have more value in confirming chronic LAI than MRI imaging. A retrospective review identified 318 cases of LAI, of which 57 met the study criteria of having an AP manual inversion stress radiograph, and an MRI, occurring within 6 months of each other without an acute injury within 12 weeks of the first image. A positive MRI was defined as pathology identified by the radiologist. In respect to the stress radiograph, talar tilt was measured and cases positive for LAI were identified based on asymmetry of the ankle joint during the stress. Of the 57 cases, 43 (75%) had a positive stress radiograph and 21 (37%) had a positive MRI. 24 cases (42%) demonstrated a positive stress radiograph/negative MRI, while 2 cases (4%) demonstrated a negative stress radiograph/positive MRI. Patients with a positive stress radiograph also had a higher average talar tilt compared to those who did not. Our data suggests stress radiographs may demonstrate a higher reliability than MRI when assessing lateral ankle ligament competence. With rising health care costs, we believe this provides a potential alternative in confirming the diagnosis of ankle instability.

B30 Title: Stem Angle Variation When Transitioning From a Posterior Hip Approach to a Direct Anterior Approach
Authors: James Jackson, DO (PGY-4)¹; Ryan Borgemenke, BS (OMS-II); Skyler King, DO¹; Matthew Heckler, DO¹; Antonio Manocchio, DO¹
Affiliation: ¹Grandview Medical Center, Dayton, Ohio; ²Ohio University Heritage College of Osteopathic Medicine, Athens, Ohio

Background: Over recent years there has been a resurgence of the direct anterior (DA) approach to the hip for arthroplasty. In this study we sought to see if there was a difference in stem angle as it approaches the posterior cortex of the femur in a single surgeon's practice as he performed posterior approach THA and then transitioned to the anterior THA. **Methods:** 356 cases by a single surgeon were reviewed. The

cross table lateral was then evaluated for stem angle as it approached the posterior cortex. **Results:** A statistically significant difference ($p < .0001$) between stem angle in our anterior and our posterior approach, 1.132 degrees (Std dev: 2.1) vs. -0.887 (Std dev: 3.5). We also found a statistically significant difference between the approaches when we looked at more than 3 degrees in either direction with the DA approach deviating 3 or more toward the posterior cortex 20% of cases vs. 14% of PA cases. **Discussion:** We found that stem angle in our DA THAs was more likely to converge with the posterior cortex over our PA THAs. We feel this is significant as we feel this may cause impingement and lead to an inability to properly seat our stem, as well as, lead to a potential stress riser if the stem puts posteriorly and lead to anterior thigh pain. **Conclusion:** When transitioning from a posterior approach to a DA total hip approach care must be taken to appropriately place stem to allow from appropriate placement.

B31 Title: Acromegaly and growth hormone deficiency are each associated with a distinct microbial signature in mice
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Affiliation: ¹Ohio University Heritage College of Osteopathic Medicine, ²Department of Translational Biomedical Sciences; ³The Diabetes Institute; ⁴Ohio University Edison Biotechnology Institute; ⁵School of Applied Health Sciences and Wellness, College of Health Sciences and Professions; ⁶Department of Biological Sciences, College of Arts and Sciences; ⁷Department of Biomedical Sciences, Heritage College of Osteopathic Medicine; ⁷Infectious and Tropical Disease Institute, Athens, Ohio

Introduction: Research has shown that the gut microbiota can regulate the growth hormone (GH)/insulin-like growth factor 1 axis; both of which play important roles in several intestinal diseases. Yet, the impact of GH on the gut microbiome has not been fully evaluated. **Objectives:** This study examined the gut microbial profile in adult bovine GH transgenic (bGH) mice (a model for acromegaly) and GH deficient (GH^{-/-}) mice relative to their respective littermate controls. **Methodology:** Microbial composition was quantified from fecal pellets at six months of age (n=10 per group) through 16S rRNA gene sequencing. Additional bioinformatics analyses and quantitative PCR assessed the unique microbial signature. **Results:** The two mouse lines showed opposite trends in *Proteobacteria* and *Epsilonbacteraeota* phyla with a significant reduction in abundance in GH^{-/-} mice and an increase in bGH mice. The GH^{-/-} microbiome demonstrated microbial immaturity, whereas microbial diversity (evenness and richness) was increased in the bGH microbiome. Both mouse lines exhibited unique microbial signatures with a commonality of six bacterial genera. Interestingly, a few bacterial candidates, *Parasutterella*, *Lachnospiraceae* and *Rikenellaceae*, followed opposite trends between bGH and GH^{-/-} mice (i.e. upregulated with increased GH action and downregulated with decreased GH action). **Conclusions:** These results reveal that both GH deficiency and acromegaly are associated with a distinct microbial profile. Moreover, these findings suggest that GH action affects the presence of certain microbiota and diversity of the microbial community. Future studies are needed to examine the impact of these GH-associated bacterial candidates on host metabolism, growth and overall health.

B32 Title: Biomechanical Assessment of Torsional Stiffness in a Supracondylar Humerus Fracture Model
Authors: David Johnson, DO¹; Melissa Wallace, BS²; William Pierce, BS²; Christopher Iobst, MD¹; R Lane Wimberly, MD²; Anthony Riccio, MD²
Affiliations: ¹Nationwide Children's Hospital, Columbus, OH; ²Texas Scottish Rite Hospital for Children, Dallas, TX

Introduction: Supracondylar humerus fractures account for 65% of fractures about the pediatric elbow.¹ Displaced fractures represent a 3-dimensional (3D) deformity, and are treated with closed reduction and percutaneous fixation.¹⁻² Most of the research pertaining to the topic focuses on coronal pin alignment, discounting the pin trajectory in the sagittal plane. While closed reduction and percutaneous pinning is the preferred treatment, no consensus on the ideal number of pins, pin configuration or pin diameter has been reached. The purpose of this study is to evaluate coronal pin configuration, sagittal pin configuration and pin diameter in rotational stability of supracondylar humerus fractures. We hypothesize that increasing pin number will increase construct stiffness. Furthermore, larger diameter pins, and pins placed in the anterior-posterior plane will result in stiffer constructs. **Methods:** A single synthetic pediatric distal humerus model was scanned and uploaded into a software program. Variable pin trajectories were planned and plastic models with predetermined pin trajectories were 3D printed. The models were osteotomized 33mm above the distal end and the pins were placed. Five pin configurations were designed with varying coronal and sagittal alignment. Three models had anterior-to-posterior sagittal pins but differed in the coronal plane to be 3 divergent, 3 parallel or 3 convergent pins. Two other models were divergent in the coronal plane, but either neutral or posterior-to-anterior in the sagittal plane. Each configuration included 3 lateral pins and a medial pin. 1.6, 2.0, and 2.4mm pin diameters were tested for each configuration. Pins were sequentially removed, and the models retested, allowing us to test the common clinical pin configurations. 3 models of each pin diameter and configuration were printed and tested to ensure uniformity. A Material Testing System was used to determine the torque required to deflect the osteotomy 10 degrees of internal and external rotation. Data analysis was conducted using student's t-test between groups with actual p-values being reported. Significance was set at 0.05. **Data and Results:** In all models and configurations, the 2.4mm pin diameter was statistically stiffer than the 1.6mm diameter pins; however, this lost statistical significance in certain patterns when comparing 2.0 and 2.4mm pins. When analyzing coronal plane alignment, divergent and parallel pins did not show a significant difference in construct stability. Convergent pins were, in general, the least stable constructs. Difference in stiffness conferred by an additional lateral pin in 3L1M (3 lateral, 1 medial) compared with 2L1M (2 lateral, 1 medial) constructs was minimal. Variations in sagittal alignment did not show a statistical difference in construct stiffness.

B33 Title: Mid-term Outcomes Following Primary Semi-Constrained Total Knee Arthroplasty in Patients Less than 60 Years Old, a Retrospective Review
Authors: David B. Johnson Jr, DO¹; Jacob Triplet, DO¹; Daniel Gaines, DO, MBA¹; Anand Gupta, MBBS, MPH¹; Kurt L. Unverferth, MD²
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Introduction: Total knee arthroplasty (TKA) is a successful operation for osteoarthritis. Typically, the knee can be balanced using posterior stabilized or cruciate retaining implants. However, in patients with severe deformity or ligamentous laxity, this cannot be obtained, and more constrained devices are needed. Semi-constrained implants, such as the Total Condylar III (TCIII) provide increased coronal stability. Outcomes in young (<60 years old) patients, following a primary semi-constrained TKA are not well reported in the literature. The purpose of this study was to evaluate patient reported outcomes, functional recovery, and implant survival in this population. **Methods:** We performed a retrospective review of 21 patients, under the age of 60 years that underwent primary semi-constrained TKA. Patient demographics, postoperative outcomes, patient satisfaction scores, and implant loosening were reported. **Results:** At an average follow up of 66 months, Knee

Society Scores (KSS) and Western Ontario and McMaster Universities Osteoarthritis Index (WOMAC) scores were 94.7 and 15.7, respectively. No difference in patient reported outcomes between 1 year and final follow up were observed. Patient demographics such as age, BMI, and gender had no effect on functional outcomes. No cases of aseptic loosening were observed. Implant survivorship, patient satisfaction, and excellent or good results were reported in 100%, 85.7%, and 92%, respectively. **Conclusion:** In young patients, in which the knee cannot be effectively balanced with standard releases, the use of a semi-constrained TKA as a primary implant lead to positive patient reported outcomes and no evidence of loosening at mid-term follow up.

B34 Title: Improving Chronic Pain Management with Proper Documentation Utilizing Updated Guidelines

Authors: Megan Kindred, BS, DO (PGY-3); Haileigh Ross, BS, BA, DO; Nicklaus Hess, BS, DO

Affiliation: Grandview Medical Center, Dayton, Ohio

Introduction: The decline in Ohio's prescription opioid deaths since 2011 corresponds with the state's efforts to reduce the prescription opioid supply available for misuse and diversion. This has included putting in place prescribing guidelines and strengthening prescription drug monitoring for the chronic use of opioids. **Objectives:** The objective of this quality improvement project is to increase physician documentation of specific measures shown to improve patient safety, including controlled substance agreements, Ohio's prescription drug monitoring program, and discussion of goals of therapy. **Methodology:** Formal didactic presentations were provided to family medicine attendings and residents at a federally qualified health center (FQHC) regarding updated Ohio laws and guidelines for prescribing opioids for chronic non-cancer pain. As part of these presentations, an updated controlled substance agreement was implemented. Education was provided on where to scan the agreement into the chart, therefore providing consistency amongst providers and easier verification of completion. A template was created which addressed the aforementioned measures, and all attendees were instructed on how to implement use of this template. **Results:** Data will be collected regarding documentation of opioid prescribing measures both individually and collectively. A comparison of documentation rates pre- and post-didactic presentations will be provided. **Summary/Conclusion:** The outcome of this quality improvement project is anticipated to have an improved overall compliance with documentation of prescribing measures for chronic use of opioids. It is also expected to identify which areas of documentation continue to be the most difficult for providers in our office, therefore identifying areas for further improvement.

B35 Title: Discovering Health Care Needs and Role of Primary Care for Families with Children with Autism in Rural Southeast Ohio

Authors: Suma Kolla, MS (OMS-IV); Bhakti Chavan, MPH; Sharon Casapulla, EdD

Affiliation: Ohio University Heritage College of Osteopathic Medicine, Columbus, Ohio

Introduction: Autism Spectrum Disorders (ASD) is a group of neurobiological disorders that is seen in 0.9% of rural populations. Children with ASD have specific needs including increased number of office visits, prescription drugs, and special education services. Primary care providers in rural areas have hesitation towards managing and diagnosing ASD due to lack of time, care coordination, and poor reimbursements.

Objectives: The objective of this study is to uncover the access to care for children with ASD in Southeast Ohio. We would like to find the satisfaction parents have with their primary care provider of the child in aiding in the screening and diagnosis of their child's Autism and giving adequate resource and referral for the child's needs. **Methodology:** In this study we interviewed parents who have children with ASD living in Southeast Ohio. A questionnaire was developed including demographic information and qualitative questions about their experience with their child. Phone interviews were conducted to facilitate the questionnaire. **Results:** Seven parents responded to the questionnaire and gave their experiences. Parents felt they had struggled with primary care providers for the initial diagnosis. After diagnosis, receiving other referrals and services through their primary provider was achievable. Other factors that came as barriers for parents included insurance coverage for services and travel distance to appointments. **Summary/Conclusion:** To conclude, parents of children with ASD residing in Southeast Ohio have lower satisfaction with primary care providers with screening and diagnosis of their child, however have better support once the diagnosis has been made.

B36 Title: The Cost and Appropriateness of Thrombophilia Testing at a Tertiary Care Institution

Authors: Stacy Lane, BS (OMS-II)¹; Steven Jubelirer, MD²; Christine Welch, MS²

Affiliation: ¹West Virginia School of Osteopathic Medicine, Lewisburg, West Virginia; ²Charleston Area Medical Center, Charleston, West Virginia

Introduction: Thrombophilia, a state of increased tendency to develop a thrombosis, can be caused by factors that are genetic, acquired, or both. Currently, there are no US guidelines for thrombophilia testing in patients with a VTE. This study evaluated the appropriateness of thrombophilia testing at CAMC. **Objectives:** To evaluate the appropriateness of thrombophilia testing in patients presenting with a first time VTE at Charleston Area Medical Center during 2017. **Methods:** This is a retrospective investigation of thrombophilia testing at CAMC. Patient records were extracted from CAMC administrative warehouse with a VTE that were 18 years old and older during 2017. These patient records were analyzed for appropriateness of the following tests: Antithrombin III levels, Protein C levels, Protein S levels, Factor V Leiden Mutation, Prothrombin Assay, Lupus Anticoagulant, Anticardiolipin Antibodies, Homocysteine levels, and Methyl Tetrahydrofolate abnormalities. Patients with previous VTE were excluded from the study. **Results:** Of 240 patients with a first time VTE, 54 had at least one of the tests performed. There were 239 tests ran in these 54 patients, and 162 of those tests were done at inappropriate times or during inappropriate clinical scenarios. The total cost of the inappropriate tests amounted to \$46,099. **Summary/Conclusions:** Thrombophilia testing is associated with high cost and is often inappropriately done. This study highlights the judicious use of thrombophilia testing and therefore healthcare dollars especially when the value of the results in clinical practice may be limited.

B37 Title: Treatment of Insertional Achilles Tendinopathy with MRI Confirmed Small or No Tear using a Gastrocnemius Recession

Authors: Bryan Large, BS (OMS-III)¹; David Zehnder, BA (OMS-III)¹; Joseph Long, BS² (MS-2)²; Brent Whitehead, BS (OMS-III)¹; Nicholas Cheney, DO³; Timothy Law DO, MBA¹

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Introduction: Insertional Achilles tendinopathy is distressing for patients and challenging to treat. When conservative management fails, surgery may be the next best option. Current literature supports gastrocnemius recession for non-insertional cases but, is inconclusive regarding insertional ones. We believe that an isolated gastrocnemius recession for insertional cases is an effective approach to treatment.

Objectives: To provide evidence that a gastrocnemius recession is an effective treatment for insertional Achilles tendinopathy and MRI confirmed small or no tears. **Methodology:** We retrospectively reviewed patient charts who received a gastrocnemius recession for insertional Achilles tendinopathy between January 2015 and July 2018. Inclusion criteria involved MRI confirmed insertional Achilles tendinopathy, no

tear/tears <20%, and lack of concurrent pathology, yielding 13 patients. Each patient's immediate pre-operative, initial post-operative, and final visit VAS pain score were recorded. **Results:** On average, chart follow up time was 15.5±10.5 weeks post-operatively (range 4-38). 2 patients had tears <20%, while 11 lacked any tear. The average pre-operative score was 5.4±1.8 (range 3-9). The average post-operative score was 0.9±1.3 (range 0-5). A paired T-test found these to be statistically different ($p < 0.001$). Notably, all patients saw a reduction in their pain score of at least 2 points. **Conclusion:** Current literature is inconclusive regarding the efficacy of a gastrocnemius recession for insertional Achilles tendinopathy. Previous studies lacked identification on the amount/type of tendon involvement using advanced imaging. Our study indicates that patients with MRI confirmed Achilles tendinopathy and no tear/tears <20% achieve adequate pain reduction post-operatively; suggesting that this procedure deserves more attention regarding its treatment of insertional cases.

B38 Title: Radiographic Outcome Analysis Following A Modified Lapidus with Fusion of the First Intermetatarsal and 1,2 Intercuneiform Joint
Authors: Jason Lauf, BS (OMS-II)¹; Joseph Long, BS (MS-2)²; Mohammed AL-Issa, BA (OMS-II)¹; Brent Whitehead, BS (OMS-II)¹; Nicholas Cheney, DO³; Timothy Law, DO, MBA¹; Kaitlyn Schimmoeller, PAC³
Affiliations: ¹Ohio University Heritage College of Osteopathic Medicine, Dublin, Ohio; ²The Ohio State University College of Medicine, Columbus, Ohio; ³OrthoNeuro, Columbus, Ohio

Introduction: In 2014, the Pacific Northwest University of Health Sciences (PNWU) implemented the Roots to Wings Mentoring Program (RTW) as a way to facilitate exposure to the healthcare field in elementary through high school students from the Yakama Nation Reservation with osteopathic medical students (OMS). **Objectives:** Over the last four years, RTW has grown and strengthened its main goal of empowering Yakama and Mexican American youth from underrepresented populations in the Lower Yakima Valley into healthcare professions. **Methods:** The RTW gathers monthly to learn about different health care professions, participate in hands on activities, and share personal stories. Co-mentoring is the foundational concept of RTW, but the curriculum adjusts to meet the necessities of the schools served. First and second year OMS mentors involved in RTW completed post session surveys for rapid cycle quality improvement of the RTW; this will be a comparison between 2016-2017 surveys and 2017-2018 surveys. **Results:** In 2016, A 20 question, Likert scale survey of n=22 mentors demonstrated an overall average of 4.09 on a 5-point scale. In 2017, the overall average has been 4.42. Of note, a comment from one of the mentors was, "I loved the hands-on activity. I also liked the talk with the different doctors and the RTW student who is now at University of Washington". **Conclusion:** The RTW will continue to assess the impact it has on OMS, how it will influence them as future physicians and as lifelong mentors, and how this model can be used in other underserved communities.

B39 Title: Incidence of Residual Neuromuscular Blockade in Intra-abdominal Surgery: A Prospective, Observational Study
Authors: Mara Leyendecker, BS (OMS-II)¹; Kevin Lee, PhD²; Rita Sharma, PhD²; Quyen Luong, DO, PhD²; Brian Harper³
Affiliations: ¹Heritage College of Osteopathic Medicine; ²Department of Biomedical Sciences; ³Ohio University, Athens, Ohio

Introduction: Our lab has previously identified *three* distinct subtypes of white adipocytes and have shown that they each differentially contribute to adipose depots. Dermal white adipose tissue (dWAT), a layer of adipocytes embedded in the skin below the dermis, has recently been shown to play a role in crucial physiologic processes including thermogenesis, the regulation of aging, scar formation, and wound healing. The purpose of this proposal is to investigate the contribution of three adipocyte subtypes to dWAT. **Objectives:** The primary objectives of this project are to determine the number of preadipocytes and adipocytes from each of three subtypes present in dWAT. **Methodology:** Lineage tracing analysis was performed by crossing transgenic mice harboring cre-recombinase under the control of promoter/enhancer elements of each of the three marker genes, Wilms tumor 1, transgelin, or myoxovirus 1 to dual-fluorescent reporter mice. These three mice lines mark Type 1-3 preadipocytes and adipocytes, respectively. dWAT was collected from mice, digested with collagenase, and subjected to FACS analysis to determine the preadipocyte contribution of these three subtypes. Adipocyte identities were determined by immunofluorescence. **Results:** We found that Type 2 (~45%) and Type 3 (~25%) cells, but not Type 1 cells significantly contributed to dWAT depot. **Summary/Conclusion:** These studies demonstrate that Type 2 and Type 3 adipocytes significantly contribute to the composition of dWAT. Since these adipocyte subtypes not only have different developmental lineages, but also have distinct physiological phenotypes, the contribution of these adipocyte subtypes may impact the crucial physiologic processes mediated by dWAT.

B40 Title: Oropharyngeal Cancer: Human-Papillomavirus Incidence on the Rise
Author: Tanner Lyons, BS (OMS-II)
Affiliations: Ohio University Heritage College of Osteopathic Medicine, Athens, Ohio

Oropharyngeal cancer (OPC) is the ninth most common cancer diagnosed worldwide, with an estimated 51,540 new diagnoses in the United States during 2018. The most common subtype of head and neck cancer is squamous cell carcinoma (SCC). Over the last 40 years, the cause of head and neck cancers has changed significantly. Tobacco and alcohol related OPC has drastically declined, while human-papillomavirus (HPV) related-SCC incidence has increased. The purpose of this study is to examine the literature for national trends, pathophysiology, along with disease prevention and treatment recommendations. Studies estimate that greater than seventy-percent of OPCs are now caused by HPV, especially high-risk genotype-16. In addition, HPV-OPSCC typically present at an earlier age than non-HPV-OPSCC, and tends to present at earlier stages but more advanced nodal disease. Early stage treatment includes radiation with minimally invasive surgery, whereas late stage disease is managed through cisplatin-based chemotherapy with symptomatic surgical debulking. The drastic rise of HPV-OPC has shifted the focus towards primary prevention to reduce disease incidence. Primary prevention through the HPV vaccination, anti-smoking and anti-drinking campaigns will help reduce incidence of OPC.

B41 Title: Screening of Ethnomedicinal Plants for Antimicrobial Activity
Authors: Madeline Mator, BS; Gustave N.K. Mbuy, PhD
Affiliations: West Chester University, Darby, Pennsylvania

Statement of the Problem/Background: Pathogenic microbes are gaining grounds in therapy becoming resistant to current antibiotics. Therefore it is important to find new and effective ways to treat these diseases by finding new drugs from unconventional sources such as plants, fungi and marine organisms. For this endeavor, we embark on screening many plants used in ethnomedicine by traditional healers to see if they have the promise for antimicrobial agents. **Research Question/Hypothesis:** Our focus is to see if these various plants used in ethnomedicinal treatment of many illness has any antimicrobial properties. **Research Methods:** Plants to be screened are extracted with different solvents by Soxhlet extractors. Following the extraction, the solvents are dried and the material recovered, collected, and stored until used. Nine microbes were grown in tryptic soy broth at 37°C. Antimicrobial activity was screened by agar diffusion technique. Zone of inhibition was determined by measuring the distance from the center of the disk to the end of the area void of bacterial growth, in centimeters.

Results/Summary: Preliminary results indicate that a few of these plants exhibited antimicrobial activity against *S. cerevisiae*, *B subtilis*, *S. aureus*, *S. typhi*, *A. faecalis* and *E. coli*. **Interpretation/Conclusion:** With the results represented, there is strong evidence supporting the claim that these ethnomedicinal plants have antimicrobial activity and should therefore be considered in the treatment of bacterial and fungal infections.

B42 Title: Static, Dynamic, and Stereological Testing of 3D-Printed Acetabular Cups – As Good as Traditional Coatings?

Authors: Kyle McGrath, BS (OMS-II)¹; Mark Gittins, DO²; Hayley Flynn, BS (OMS-II)¹

Affiliations: ¹Ohio University Heritage College of Osteopathic Medicine, Dublin, Ohio; ²OrthoNeuro, Columbus, Ohio

Introduction/Objectives: Cementless total hip arthroplasty (THA) is a surgical procedure commonly used in the treatment of osteoarthritis of the hip. Implant manufacturers typically apply porous coatings (e.g. beads or Ti plasma-spray) to acetabular cup substrates to promote bone ingrowth, but have recently begun to leverage additive manufacturing (“3D printing” or “AM”). AM enables implant designers to create porous structures in configurations that were previously not possible, as the structures are “grown” from the substrate, not applied. The goal of this study is to compare design features and properties of AM and non-AM acetabular cups. **Materials/Methods:** Two-point fatigue, abrasion, static shear, static tensile, shear fatigue, plastic deformation, and particle debris tests were performed on AM and non-AM acetabular cups. **Results:** Fatigue Testing – Run Out Loads & Debris Shedding: Endurance limits were 1300 N and 1100 N for AM and non-AM cups, respectively. There was no measurable difference in weight or debris shedding for the AM and non-AM acetabular cups after 2.5 million cycles of two-point fatigue loading at 1500 N. Porous Structure Testing: The AM porous structure exceeded acceptance criteria in all testing – shear fatigue strength, static shear strength, static tensile strength, abrasion resistance, and plastic deformation. **Conclusion:** The fatigue strength, minimal debris shedding, and stereological properties of the AM acetabular cup, along with design features including a gradient porosity, perpendicular struts, and anti-rotational peripheral fins indicates that additive manufacturing can produce implants that may lead to better short-term stability and patient outcomes.

B43 Title: Operative Time with NAVIO Robotic-assisted Surgical Device in Unicompartmental Knee Arthroplasty (UKA) and Total Knee Arthroplasty (TKA) Patients

Authors: Kyle McGrath, BS (OMS-II); Hayley Flynn, BS (OMS-II)

Affiliation: Ohio University Heritage College of Osteopathic Medicine, Dublin, Ohio

Introduction: In both UKA and TKA, robotic-assisted surgery has been shown to optimize the precision of implantation and improve clinical results and implant durability¹. However, integrating new technology into the operating room can be associated with longer operative time and an increase in hospital operating room work flow. **Objective** The objective of the study was to assess intra-operative time using NAVIO robotic-assisted surgical device in UKA and TKA Patients. **Methods:** Between March 2017-November 2017, 70 robotic-assisted UKA were performed and between July 2017-April 2018, 40 robotic-assisted TKA were performed by a single board certified orthopedic surgeon to analyze intra-operative time. The time includes three-dimensional registration of actual bony surfaces to the digital reconstructions, intra-operative planning and bone resection. This time was calculated for each case using NAVIO device log files and descriptive statistics were performed to calculate mean time for each phase and total operative time using Microsoft Excel. Trend lines for all cases over the study period using Tableau software were estimated. **Results:** Mean operative time for UKA procedures was 16.34 minutes (range: 11.25 minutes - 33.52 minutes) and mean operative time for TKA procedures was 30.03 minutes (range: 21.55 minutes – 60.12 minutes). Mean time for registration (UKA=4.49 minutes; TKA=7.94 minutes), planning (UKA=2.57 minutes; TKA=4.80 minutes) and bone cutting (UKA=9.28 minutes; TKA=17.30 minutes) were reported. **Conclusion:** The measured intra-operative times demonstrate that the NAVIO system aims to provide ergonomic and efficient robotics assisted solutions for orthopedic reconstruction.

B44 Title: High Diabetes Distress Associated with Suboptimal Glycemic Control in Adults with Type 1 Diabetes in Rural Appalachia

Authors: Nichol McHale, DO (PGY-2)¹; Autumn Haynes, DO¹; Elizabeth Beverly, PhD²

Affiliations: ¹OhioHealth O’Bleness Hospital, Athens, Ohio; ²Ohio University Heritage College of Osteopathic Medicine, Athens, Ohio

Introduction: The prevalence rate of diabetes in southeastern Ohio is 19.9%, more than double the national average (9.4%). The impact of diabetes is understudied and one critical outcome that has not been addressed is diabetes distress. Diabetes distress is an affective condition that addresses a patient’s burdens, frustrations, and worries about living with diabetes. **Objective:** The purpose of this study was to assess the impact of diabetes distress on glycemic control in adults with diabetes. **Methods:** We conducted a cross-sectional survey study with adults with diabetes in southeastern Ohio. Diabetes distress was assessed using the Diabetes Distress Scale; depression was assessed using the Patient Health Questionnaire-9. Linear regression analyses assessed the relationship between diabetes distress and glycemic control. **Results:** A total of 212 participants completed the survey. Of the 94 T1D participants, 31.0% reported high diabetes distress and 32.2% of T2D participants reported high distress. Further, 22.9% of T1D and 23.0% of T2D participants screened positive for severe depression. Linear regression models showed high diabetes distress scores (standardized $b = 0.325$, $p = 0.037$) were independently associated with higher A1C levels after controlling for depression, age, and gender in T1D participants. **Conclusions:** In T1DM participants, high diabetes distress scores were associated with higher A1C levels, but this was not true for T2D participants. Depression clearly affects both T1D and T2D participants. As clinicians aiming to delivering holistic care, osteopathic physicians must not only focus on glycemic control, but also pay attention to the person as a unit of mind, body, and spirit.

B45 Title: Investigating the expression of Wnt5a isoforms in urothelial carcinoma

Authors: Amy Mehlman, BS (OMS-II); Karen T. Coschigano, PhD; Ramiro Malgor, MD

Affiliation: Ohio University Heritage College of Osteopathic Medicine, Athens, Ohio

Introduction: Research performed both at Ohio University and by other scientists has linked a protein, Wnt5a, to urothelial carcinoma (UC), which is the most common form of bladder cancer. Recent research has suggested that two Wnt5a isoforms, Wnt5a-Short (S) and Wnt5a-Long (L), may play differing roles in different cancers, with Wnt5a-S promoting cellular proliferation and Wnt5a-L suppressing cellular proliferation. **Objectives:** Measure Wnt5A isoform expression to test the hypothesis that high grade tumors will express higher levels of the Wnt5a-S isoform than low grade tumors, and in contrast, high grade tumors will express lower levels of Wnt5a-L than low grade tumors. **Methodology:** We are using laser microdissection (LMD), real-time reverse transcription / polymerase chain reaction (RT-RT/PCR), and immunohistochemistry (IHC) to localize and quantify each Wnt5a isoform in human UC cell lines and biopsies from low and high grade tumors. Descriptive and inferential statistics will be performed using parametric or non-parametric tests, as deemed appropriate for each analysis. Two-tailed p values < 0.05 will be considered statistically significant. **Results:** WNT5A isoform expression was highly variable among the UC cell lines. We are currently investigating expression in the biopsy samples, expecting to see a clearer trend between aggressiveness and isoform expression. **Summary:** Our

results should support the idea that the Wnt5a-S isoform promotes UC aggressiveness and cellular proliferation, while the Wnt5a-L isoform exhibits opposite effects. Future experiments will be aimed at determining the molecular pathway(s) through which each isoform acts in order to advance diagnostic, prognostic, and therapeutic approaches to UC.

B46 Title: Patellar Fixation Following Fracture: A Retrospective Review of Outcomes following Varying Surgical Interventions
Authors: Anthony Melaragno, BS (OMS-II)¹; Braden Passias, BS (OMS-IV)¹; Jacob Triplet, DO²; David Johnson, DO²; Benjamin Taylor, MD³
Affiliations: ¹Ohio University Heritage College of Osteopathic Medicine, Athens, Ohio; ²OhioHealth Doctors Hospital, Columbus, Ohio; ³OhioHealth Orthopedic Trauma and Reconstructive Surgeons, Columbus, OH

Introduction: Patella fractures are a common injury in trauma patients and can be treated with a multitude of different fixation methods. With different fixation modalities available, no current consensus exists for patients presenting with this injury. **Objectives:** With no current consensus of best practices, this analysis sought to review the multiple different patella fixation strategies and to evaluate the outcomes and complications associated with each. We also sought to examine whether there was any demographic related circumstances or conditions that associated with post-operative findings. **Methodology:** We conducted a retrospective chart review of one hundred and fifteen patients who underwent operative fixation following acute patellar fractures. All of these patients were treated by one of five fellowship-trained orthopedic trauma surgeons at an urban Level-1 Trauma Center. Statistical analysis was then performed and compared using student's t-tests. **Results:** Results demonstrated that plating techniques had the highest overall rate of union. Furthermore, a significant decrease in implant removal with utilization of isolated sure/wire was appreciated compared to other fixation groups (P<0.01). The analysis of the demographical data revealed no differences between all the treatment groups except for younger patients, who were more likely to be treated with screw only fixation versus plating. **Summary/Conclusion:** We conclude that plate utilization achieves high radiographic union compared with other fixation methods. Despite hardware removal being one of the most commonly reported complications of patella fracture repair, no significant differences in hardware removal between modalities was observed. Larger prospective trials comparing the various modalities are needed.

B47 Title: A national survey on health professionals' knowledge and attitudes about service dogs
Authors: Alexander Merk (OMS-II)¹; Emily Nelson (OMS-II)¹; Kelly Nottingham, MPH¹; Lisa Forster, MS¹; Brian Plow, MFA²; Todd Fredricks, DO¹
Affiliation: ¹Ohio University Heritage College of Osteopathic Medicine, Athens, Ohio; ²Ohio University Scripps College of Communication, Athens, Ohio

Introduction: The use of service dogs is a relatively unexplored subject. Little research exists on attitudes or knowledge about service dogs and their owners. Gaining insight into health professionals' understanding of service dogs is critical because misinformation about service dogs could affect policy decisions leading to poor treatment and health outcomes of people with service animals who are seeking treatment. Given the surge in the number of service animals, the increasing confusion and potential for discrimination in a clinical setting, there is a strong need to better understand the issue. **Objective:** (1) Assess health care professionals' knowledge of policy and practices concerning the use of service dogs. (2) Understand the attitudes of health care professionals toward service dogs and their owners. **Methodology:** National anonymous online 24 question survey with open- and close-ended questions using snowball sampling disseminated through Qualtrics. Any health professional working in a clinic or hospital setting is eligible. Anyone under 17, who cannot read or write English, or who works at a long-term care facility or in home health care will be excluded from participating. Surveys will be disseminated to investigators' professional contacts and Heritage College preceptors. They will be asked to share the survey with colleagues. Expected number of participants: 500. **Anticipated Results:** Limited breadth and depth of knowledge regarding service dog policy and practice. Variable attitudes towards service animals. **Conclusions:** Results could help develop educational tools to prepare healthcare professionals on how to respond when service animals are brought into a clinic or hospital.

B48 Title: The influence of opioid related perceptions and clinical experiences on medical students' postgraduate intentions to work with patients with opioid-use disorder
Authors: Sophia Mort, BS (OMS-III)¹; Sebastian Diaz, PhD, JD²; Elizabeth Beverly, PhD^{2,3}
Affiliations: ¹Ohio University Heritage College of Osteopathic Medicine; ³Ohio University Department of Translational Biomedical Sciences; ²Ohio University Diabetes Institute, Athens, Ohio

Introduction: Opioid misuse is increasing in the United States, particularly in Ohio. However, current research does not address future prescribers' knowledge, beliefs and postgraduate treatment intentions pertaining to opioids. **Objectives:** This study aimed to (1) describe osteopathic medical students' perceived impact of the opioid crisis, personal experiences and postgraduate plans and (2) determine if personal experiences with opioids influence intentions regarding future medical practice. **Methodology:** A cross-sectional survey of 335 osteopathic medical students (years 1-5) at Ohio University was conducted. **Results:** Most participants were female and in the preclinical phase of training (female=54.0%; year 1=34.9%; year 2=33.1%; years 3-5=31.9%). Female students expressed more stress (p=0.008) and less confidence (p<0.001) in treating patients with opioid addiction. Significantly more first-year students believed reducing opioid prescriptions would end the opioid crisis (p=0.002); fewer first-years believed physicians needed to detach from patients with opioid addiction (p=0.017). As expected, students on clinical rotations (years 3-5) had more experience treating acute opioid overdose (p<0.001) and interacting with drug seeking patients (p<0.001). Regardless of academic year, more clinical experience was correlated with increased confidence in managing patients with opioid addiction and stronger intention to include this group in students' future patient populations. **Conclusion:** These findings suggest that opioid related attitudes differ after just one year of medical school. Moreover, clinical experiences influence postgraduate plans to work with patients with opioid-use disorder. Early clinical exposure in the first two years of medical school could enhance learning and increase students' willingness to work with patients struggling with opioid addiction.

B49 Title: Examining Osteopathic Medical Students' Perception of Support
Authors: Samantha Nandyal, BS (OMS-II); Jason Rodriguez (OMS-IV); Bhakti Chavan, MBBS, MPH; Sharon Casapulla, EdD
Affiliation: Ohio University Heritage College of Osteopathic Medicine, Athens, Ohio

Introduction: Physician burnout has been an increasingly discussed topic, and is one that has potentially harmful outcomes, including suicide. Research suggests that physician burnout begins in medical school, and may even begin in the pre-clinical phase of medical school prior to beginning clinical rotations. With this in mind, the investigators sought to determine the perceptions of social support at Ohio University Heritage College of Osteopathic Medicine (OU-HCOM). The Interpersonal Support Evaluation List (ISEL) was sent to the student body of OU-HCOM to assess perceptions of social support across all campuses and phases of medical education. Additionally, the investigators requested demographic

data to determine if there are significant differences in perceived social support on the basis of race, ethnicity, sexual identity, campus location, phase of medical training, and involvement in student organizations and extracurricular activities. **Methodology:** Medical students at OU-HCOM completed the Interpersonal Support Evaluation List (ISEL) anonymously via a web-based survey. The data was then transferred to SPSS and analyzed in the aggregate using descriptive statistics. **Results:** Female students had lower levels of Belonging Support, but students from rural hometowns reported a higher sense of Belonging Support than any other group. Students in the clinical phase of medical education (OMS 3-4) reported lower levels of Belonging Support than students in the non-clinical phase. Students in the RUSP Program had higher perceived belonging and tangible support compared to students who are not in the RUSP program. Students from suburban hometowns who participate in the RUSP program reported higher Self-esteem Support. We found associations between the types of social support in some groups, suggesting that the constructs are not discrete but are inter-related. **Conclusion:** Our results suggest some potential implications for practice including focusing on increasing Belonging Support in female students and in students who are in the clinical phases of medical education. Overall, Self-Esteem Support was the type of social support with the lowest mean in all groups for all variables. As such, medical educators should consider ways to strengthen this type of social support in their students.

B50 Title: Does table positioning influence perioperative complications and reoperation following direct anterior total hip arthroplasty: a systematic review.

Authors: Justin Butler, DO (PGY-5); Benjamin Boothby, DO; Richard Miller, DO

Affiliations: Mercy Health, Toledo, Ohio

The evolution of anterior minimally invasive surgery (AMIS) created two predominant table positioning techniques; traction-assisted (TA) and traction-less (TL). While AMIS has demonstrated improvements in dislocation, functional recovery, and patient satisfaction, the procedure is not without complications. The goal of our investigation is to compare multiple outcome measures for each technique, specifically reoperation, fracture, and instability. A systematic review of Embase and PubMed was queried for patients undergoing un-navigated, unilateral direct anterior cementless hip arthroplasty. Full text articles with a technical description, minimum 6 month follow up, minimum 50 patients were included. Primary outcomes included reoperation, instability, and/or fracture. Case reports, expert opinion, or registry data were excluded. 15 cohorts described in 14 full-text publications met inclusion criteria (n=3879 hips). 5 studies (n=966) and 10 studies (n=2913) described TL and TA positioning, respectively. Rates of reoperation (1.2% v. 3.8%), fracture (1.9% v. 3.4%), instability (1.0% v. 1.3%), and deep infection (0.1% v. 1.1%) favored the TL technique. At the minimum 6 months follow up no difference in HHS was identified (94.1 v. 93.3). Reoperation, fracture, instability, and deep infection favored the TA technique in multiple series with a minimum 6 months following unilateral cementless anterior THA. With the projected growth in THA and varying reimbursement models it is important to recognize potential complications related to different techniques in AMIS. We hope our findings will serve as a nidus for future high-level investigation into the true difference between these common arthroplasty techniques.

B51 Title: Development and Implementation of a 3 Year Longitudinal Osteopathic Curriculum for Residents in an ACGME Accredited Residency Program with Osteopathic Recognition

Authors: Nina Oberschmidt, DO (PGY-1)¹; Ben Bring, DO¹; Max Frenwald (OMS-II)²

Affiliations: ¹OhioHealth Dublin Methodist Hospital Family Medicine Residency, Dublin, Ohio; ²Ohio University Heritage College of Osteopathic Medicine, Dublin, Ohio

Introduction: By 2020 there will be a single accreditation system, and both DO and MD students will apply through a single residency match. Because of this transition, residency programs will need to develop an Osteopathic curriculum to qualify for Osteopathic Recognition (OR). OR provides an opportunity for MDs to learn Osteopathic Manipulative Treatment (OMT) and Osteopathic Principles and Practice (OPP) while enabling DO residents to maintain and improve their skills. Currently, there are few resources that outline curriculum development to teach Allopathic residents OMT and OPP in an ACGME Osteopathic Recognized program. **Objectives:** This academic project will develop a standardized longitudinal Osteopathic curriculum. Residents will be taught to deliver compassionate, evidence-based, high-quality, cost-effective care to patients of all ages in a three-year track. Lectures and hands-on sessions are focused on applying OPP, identifying anatomical landmarks, and treating somatic dysfunction in continuity patients. **Methodology:** This curriculum is focused on the adult learner; self-directed learning prior to lectures consists of pre-reading, online videos, and journal review. The lecture format includes a case presentation and group discussion, background information on a topic, review of OMT and OPP, and "treatment progressions" whereby residents are taught an algorithm for specific cases of somatic dysfunction. **Results & Conclusions:** This project is ongoing. Competency will be assessed twice annually at practical exams. Following graduation, residents will complete an annual survey of Osteopathic Medicine use in current practice. Pre- and post-assessments of resident knowledge will be administered through formal evaluations.

B52 Title: Exploring the Impact of Family Medicine Longitudinal Integrated Clerkships on Students

Authors: Ryan Paulus, BS (OMS-IV)¹; Dorvan Byler (OMS-IV)¹; Cristina Randolph, MPH (OMS-IV)¹; Sonja Porter (OMS-IV)¹; Tim Cutler (OMS-IV)¹; Autumn Haynes, DO²; Sharon Casapulla, EdD¹; Randall Longenecker, MD¹

Affiliation: ¹Ohio University Heritage College of Osteopathic Medicine, Athens, Ohio; ²OhioHealth O'Bleness Hospital, Athens, Ohio

Introduction: Longitudinal integrated clerkships (LIC) allow students to participate in longitudinal, comprehensive care of patients. LIC's improve student satisfaction and increase student interest in primary care. A year-long, mini-LIC was created at OU-HCOM in which students spend one half-day per week at a rural primary care clinic. **Objectives:** This study assessed the impact of a family medicine mini-LIC on students. **Methodology:** Five students were interviewed at the conclusion of their mini-LIC about the impact of the experience. Interviews were transcribed and coded in a participatory manner. A thematic analysis was conducted using NVivo v11. Students completed weekly surveys about perceived well-being for the entire week and on the LIC day. **Results:** Student's had increased interest in primary care and developed a broader understanding of the specialty. They experienced the dynamics of rural health and developed increased interest for rural health. Relationships with patients allowed students to feel like valuable member of the healthcare team and to see patients as people. Preceptor relationships led to the development of mentorship. Four out of five students were happier on their mini-LIC day compared to the overall happiness from the week. **Summary/Conclusion:** This mini-LIC solidified primary care as a career path for students in the midst of a primary care shortage. With increasing burnout in medicine, students were happier on their LIC days. Increasing student interest in rural health, provoking students to view patients in a holistic manner, and facilitating mentorship with clinicians were all themes of this mini-LIC that are lacking in typical medical school curriculums.

B53 Title: Osteopathic Medical Students' Level of Connectedness and Comfort with Inter-Campus Interaction**Author:** Isaac Pearce, BS (OMS-II); Elizabeth Beverly, PhD**Affiliation:** Ohio University Heritage College of Osteopathic Medicine, Athens, Ohio

Background: Patients with a BRCA mutation have a lifetime risk of developing breast cancer up to 87% by age 70. Given the significant expense associated with lifetime screening for BRCA 1 and 2 patients, surgery may not only be an option to prevent cancer but may reduce healthcare cost as well. **Objective:** Our objective is to demonstrate the cost-savings to the patient of having prophylactic surgery instead of lifetime screening. **Methodology:** We performed a projected cost analysis based on an estimate of lifelong, high-risk screening compared to prophylactic bilateral mastectomy with DIEP reconstruction. The lifetime screening included the cost of 1 office visit per year, an annual breast MRI, and mammogram. Costs were calculated from average expenses from our billing hotline. Included in this surgery cost was the operating room fees, plastic surgeon fees, anesthesia fees, and the hospital stay. **Results:** The patient out of pocket cost for high-risk screening is calculated to be \$1,322 annually and \$59,490 over the patient's lifetime. The insurance company pays an additional \$1,289/year with a lifetime total of \$58,005. The bilateral prophylactic mastectomy with DIEP reconstruction cost was estimated at \$111,426. If an insurance plan has an out of pocket maximum of \$5000 the patient has the potential of a lifetime savings of \$54,490. **Summary/Conclusion:** Patients with a BRCA mutation will save more than \$50,000 over their lifetimes by choosing to undergo early risk-reducing prophylactic mastectomy with reconstruction. Therefore the surgery option not only reduces cancer risk, but also has a significant lifetime cost savings.

B54 Title: Are Osteopathic Students with a Physician Relative More Likely to Experience Success in Medical School?**Authors:** Robert Petrie, DO (PGY-3); Sadie Garita, DO; Elizabeth A. Beverly, PhD; Jean Rettos, DO; Bela Bhatt-Koshal, DO**Affiliation:** Ohio University Heritage College of Osteopathic Medicine, Athens, Ohio

Introduction: Educators need to ensure successful recruitment, retention, and progression of students to help diversify medical student bodies. This necessitates unique assessment of intellectual capital. **Objective:** The purpose of this study was to assess the impact of physician relatives on osteopathic medical students' background and performance in medical school. **Methodology:** In this descriptive, cross-sectional study, we conducted independent samples t-tests and Chi-Square tests to compare differences in MCAT scores, GPA, leadership positions, sleep, Intolerance of Uncertainty, Grit, and General Self-Efficacy between students with and without a physician relative. **Results:** A total of 420 students (mean age=25.4 ± 3.2 years, 55.5% (n=233) identified as female, 78.3% (n=329) white, 37.4% (n=157) OMS I, 38.6% (n=162) physician relative, 16.2% (n=68) physician parent) completed the survey for a response rate of 51.5%. Independent samples t-tests were run for students with physician parents compared to those without. Medical students with and without physician relatives did not differ by MCAT scores, GPA, sleep, number of leadership positions, self-efficacy, or grit. However, we observed a difference in Intolerance of Uncertainty (t= -2.830, p=0.005), such that students without a physician relative were more likely to consider the possibility of negative events occurring as unacceptable. **Summary/Conclusion:** In general, students with and without a physician relative shared similar background, undergraduate experiences, lifestyle behaviors, and measures relevant to professional formation. Importantly, medical students without a physician relative expressed more uncertainty, which may be indicative of worry, state anxiety, and related anxiety pathologies. More research is needed to confirm this finding.

B55 Title: Maternal and child health outcomes among pregnant women enrolled in STEP ONE for a Healthy Pregnancy, specifically non-English speaking under 21 population and substance use during pregnancy**Authors:** Keisha Pierre-Lys, BS, MS (OMS-III); Zelalem Haile, PhD; Chevan Bhakti, BS; Roche Rosellen, MD, PhD**Affiliations:** Ohio University Heritage College of Osteopathic Medicine, Athens, Ohio

Introduction: Research has shown that the underserved community is more likely to experience worse pregnancy outcomes. StepOne's program is trying to combat this endemic locally in Franklin County Ohio, allowing underserved individuals to get access to affordable and convenient health care during pregnancy. Through the Step One program, surveys were conducted to better serve the patients. This research's goal is to run analysis on the data to make meaningful recommendations in the populations seeking assistance from the Step One program. **Methods:** Analysis was performed on a pre-formed questionnaire conducted from initial assessment of the pregnant patients (N=6650). Data was categorized among the eligible population groups; under 20, and 20-21. Focus of this research was the use of substance use within the eligible population. Substance use includes tobacco use, alcohol, and drug use. The under 21 group was then divided into non-English vs English speaking groups. **Results:** Regression analysis of the exposure on the eligible ages 21 and younger (n=1219), and the cofounders adjusted for, outcomes show Non-English pregnant women are less likely to be on substance use than English-speaking pregnant women. Substance use was also likely to be used among ages 20-21 Non-Hispanic Caucasians (reference), women who had mental issues, and women had at least one comorbidity. **Conclusion:** Risk factors were significant for substance use within the pregnant non-English speaking 20-21 population. These results can be an indication to highlight more questions and surveys done at increasing risk assessment of substance use within these groups.

B56 Title: The Experience of Healthcare Providers Caring for the Refugee Population in Northeast, Ohio**Authors:** MacKenzie Reece, MS (OMS-II); Sarah Rubin, MSc, PhD**Affiliations:** Ohio University Heritage College of Osteopathic Medicine, Cleveland, Ohio

Introduction: qualitative research has shown that, refugees resettling into other countries are faced with many barriers in the healthcare setting; however, there is limited qualitative research from the Primary Health Care (PHC) providers' experience caring for refugees in America. Examination of the PHC providers' experience adds to a holistic understanding of the healthcare needs of refugees. **Objective:** gather experiences and narratives from PHC providers, to elicit themes related to their experience caring for the refugee population in Northeast, Ohio. **Methods:** qualitative study, descriptive phenomenological method utilizing open-ended, semi-structured interviews (n=7) current/ licensed PHC providers (4 physicians and 3 family nurse practitioners), working in a clinic/ practice in NE, Ohio, providing care to four or more refugee patients per week. Open and thematic coding to elicit themes. **Results:** Three themes were elicited including experiences in: 1) satisfaction, 2) challenges, and 3) ways to improve care for the refugee population. **Conclusion:** PHC providers found refugee care satisfying and rewarding; however, challenges were faced by the providers in the provision of comprehensive and patient-centered care at their respective clinics demonstrating a critical need to improve the allocation of healthcare resources for providers and affordability of healthcare for refugees in the United States.

B57 WITHDRAWN

- B58 Title:** Findings from the Hypertension Quality Improvement Project in a Rural Family Medicine Clinic in Southeastern Ohio
Authors: Marc Richards, DO, MBA, BA (PGY-3)¹; Sarah Adkins, PharmD^{2,4}; Jean S. Rettos, DO¹; Bela Bhatt-Koshal, DO¹; Robert Petrie, DO¹; Morgan Gordon, DO¹; Kevin Gross, DO¹; Nichol McHale, DO¹; Autumn Haynes, DO¹; Timothy D. Law, Jr., DO¹; Kaitlin Hicks, DO¹; Sadie Garita, DO¹; Elizabeth A. Beverly, PhD^{3,4}
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Introduction: In the State of Ohio, one in three adults have high blood pressure. High blood pressure contributes to heart attacks, strokes, morbidity, and mortality. Quality improvement projects that implement evidence-based strategies to improve blood pressure control in order to reduce the burden of chronic disease may show significant benefit, especially those in rural areas. As part of a state-wide collaborative in consultation with Medicaid plans, strategies to manage outcomes was implemented by a rural Family Medicine residency clinic in Ohio.

Objective: The purpose of this quality improvement project was to improve blood pressure control in a rural Family Medicine residency clinic.

Methods: As one of 12 primary care practices in the Hypertension Quality Improvement Project, we completed the following activities: 1) work in partnership with a managed care plan, 2) identify and support team members, 3) use a standardized data collection protocol to transmit Electronic Health Record data, 4) attend monthly action period calls to share best practices and learn from your peers, 5) engage in site-specific quarterly coaching opportunities, 6) commit to testing and adapting best practices, interventions and tools related to hypertension control, and 7) developed processes to implement quality improvement steps required. **Results:** Heightened awareness of blood pressure control metrics was achieved in the clinical setting resulting in minimal change in blood pressure outcomes for patients. **Summary/Conclusion:** Quality metrics are worthy means to the goal of improving patient outcomes, however, improvement in patient blood pressure outcomes requires a team effort including patient, staff, payer, and physician.

- B59 Title:** Progression of Femoral Vascular Access in Trauma Patients Since REBOA Implementation
Authors: Kallie Roberts, DO (PGY-3)¹; Timothy Wolff, DO²; Kate Gordon, PA-C²; Paul Bonner, DO¹; Urmil Pandya, MD²; M. Chance Spalding, DO, PhD²
Affiliation: ¹OhioHealth Doctors Hospital, Columbus, Ohio; ²OhioHealth Grant Medical Center, Columbus, Ohio

Introduction: Resuscitative endovascular balloon occlusion of the aorta is an emerging tool used in the acute resuscitation of patients in hemorrhagic shock. Greater than 50% of the procedural time is attributed to obtaining common femoral artery (CFA) access, establishing it as the rate-limiting step. **Objectives:** To analyze femoral vascular access in trauma patients since the initiation of our REBOA program.

Methodology: Demographic, physiologic, vascular access, blood products, and outcomes data were retrospectively collected on trauma patients at a level 1 trauma center who received femoral arterial catheterization (FAC) from July 2016 to September 2018. CT evaluations were independently reviewed to assess catheter placement accuracy. **Results:** FAC was performed in 123 patients for hypotension (72.3%), BP monitoring (17.1%), or REBOA (10.6%), with 34 in the first 13 months and 89 in the second. Femoral venous catheterizations (FVC) among the same patients were 94 (76.4%). Median (Q1, Q3) times from arrival to FAC and FVC were 20 (14, 29) and 18 (12, 23) minutes, respectively. CT revealed successful CFA and femoral vein cannulation in 87.2% and 93.1%, respectively. Significant differences were found in percutaneous approach (85.3% vs. 96.6%; p=0.02) and the attending surgeon obtaining access (44.1% vs. 11.2%; p<0.001) among FAC patients. **Conclusion:** FACs increased by 162% during the first 26 months after implementation of a new REBOA program. Change in the training level of the provider obtaining access did not significantly affect vascular access times, accuracy, or patient outcomes, reflecting parallel growth of our REBOA program with our graduate medical education.

- B60 Title:** Pancreatic islet response to extreme hyperglycemia
Authors: Daniel Rochester, BS (OMS-II)¹; Kathryn L. Corbin²; William J. Koch^{2,3}; Craig S. Nunemaker, PhD^{2,3}
Affiliations: ¹Ohio University Heritage College of Osteopathic Medicine, Athens, Ohio; ²Department of Biomedical Sciences; ³Ohio University Diabetes Institute, Athens, Ohio

Introduction: Current research suggests maximum insulin secretion rates occur at 16 mmol/L glucose (288 mg/dL) in both mice and human beta cells. However, there have been case reports of individuals having blood glucose levels of around 100 mmol/L (1800 mg/dL), including the world record blood glucose level of 147.6 mmol/L (2656 mg/dL). These cases involved extreme presentations of diabetic ketoacidosis or hyperosmolar hyperglycemic non-ketotic syndrome. **Objectives:** We wanted to determine what happens to insulin secretion from beta cells in cases of extreme hyperglycemia as seen in the patient cases. It was our hypothesis that extreme hyperglycemia would inhibit beta cell insulin secretion, thus potentially contributing to ongoing hyperglycemia. **Methodology:** Pancreatic islets were isolated from CD-1 mice and incubated in glucose solutions ranging from 0-144 mmol/L glucose (0-2592 mg/dL) in 12 mmol/L intervals for 1 hour. Insulin secretion was measured by enzyme-linked immunosorbent assay to generate a glucose stimulated insulin secretion curve. **Results:** The insulin secretion curve produced an EC50 of 24mmol/L (432 mg/dL) and a plateau of insulin secretion at ~48 mmol/L glucose (864 mg/dL), which is much higher than previously thought. Additionally, we measured cell-death by AnnexinV and propidium iodide fluorescence, which showed that extreme hyperglycemia does not appear to be toxic to islets for up to 48 hours. **Summary/Conclusion:** These initial trials suggest that insulin secretion continues to rise in a dose-response fashion to around 48 mmol/L glucose (864 mg/dL). In addition, there does not appear to be an over-stimulation 'shut off' point for beta cell insulin secretion.

- B61 Title:** The Role of Osteopathic Medicine in Postconcussion Syndrome
Authors: Marija Rowane, BA (OMS-I)¹; Paul Bures, DO²; Michael Rowane, DO, MS, FAAFP, FAO³
Affiliations: ¹Ohio University Heritage College of Osteopathic Medicine, Athens, Ohio; ²University Hospitals, Cleveland, Ohio; ³Lake Erie College of Osteopathic Medicine, Erie, Pennsylvania

Introduction: Postconcussion syndrome (PCS) is a complex pathophysiological process that manifests in the brain and demonstrates various symptoms following a traumatic brain injury (TBI), yet no absolute osteopathic protocol has been validated to advance the recovery speed. **Objective:** To determine the clinical findings and therapeutic benefits of osteopathic manipulative treatment (OMT) in the multidisciplinary management of PCS. **Methodology:** This study involved administering an online survey to the faculty of all American Osteopathic Association approved, Sports Medicine fellowship programs to determine the current application and success of OMT in the management of PCS. Survey questions addressed demographics of participating physicians and clinical encounters with PCS patients, identifying specific regions of somatic dysfunction and OMT techniques. **Results:** Varying demographics of the forty-four (44) participating physicians, representing pre-doctoral training at seventeen (17) different osteopathic medical schools, predominantly reported treating PCS at least on a monthly basis, requiring a mean of three (3) OMT treatment sessions for clinical improvement. Cervical spine (63%) and head (58%), as well as the atlanto-occipital and

spheno-basilar, were identified as regions with the highest frequency of somatic dysfunction. Myofascial Release (56%), Muscle Energy (44%), and Osteopathic Cranial Manipulative Medicine (40%) were ranked as the most utilized OMT modalities in PCS treatment. Eighty-three percent (83%) of physicians recognized “some” or “much” improvement in PCS symptom alleviation utilizing OMT. **Conclusion:** OMT appears to improve outcomes for patients with PCS. A standard OMT protocol for PCS could be developed with combination of modalities on the cranial and cervical spine regions.

B62 Title: An examination of first and second year medical students' perspective on social media use and previous training regarding e-professionalism

Authors: August Runyon, BS (OMS-II); Lisa Forster, MS; Anna Kerr, PhD; Tracy Shaub, DO

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Introduction: Incoming medical students are considered digital natives having grown up with social media. However, improper usage of social media can have dire consequences that include compromising patient privacy, lawsuits, the loss of a medical license, and erosion of trust between providers and patients. Therefore, it is imperative to understand their perspective about what constitutes professionalism online and whether they have had previous e-professionalism training. This study helps reveal educational gaps that will guide the development of an e-professionalism course to strengthen future primary care physicians' communication competencies and professionalism. **Objective:** To determine first and second year medical students' beliefs and perceptions of social media and understand if they've had prior e-professionalism training. **Methodology:** An online 76-item survey using Likert-scale and open-ended questions will be distributed to candidates using email, Facebook, word of mouth, and snowball sampling. **Results:** It is anticipated that first and second year medical students lack formal e-professionalism training and are unfamiliar with what future employers expect regarding online behavior. The results of the study will help us to identify if medical students have separate attitudes and beliefs about physicians' social media presence than they do for themselves. It will also help us understand medical students' self-efficacy for maintaining a professional identity. **Conclusions:** E-professionalism training gaps exist, and students could benefit from more education in this area to strengthen communication and professionalism competencies.

B63 Title: The Relationship Between E-cigarettes and Depression

Authors: Omar Saeed, BS (OMS-II); Bhakti Chavan, MPH; Zelalem Haile, PhD, MPH

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Introduction: Electronic cigarettes were originally proposed as an aid in smoking cessation, however their efficacy has yet to be demonstrated. More often they are used to continue tobacco usage and are seen as gateway devices for nicotine use in adolescents. Other reports comment on the physical health correlates of e-cigarettes including toxins and carcinogenic effects. Few studies have analyzed the mental health correlates of e-cigarettes. **Objectives:** To evaluate associations between e-cigarette usage and depression. **Methods:** The present cross-sectional study analyzed data from the individuals who participated in the Behavioral Risk Factor Surveillance System (BRFSS) survey in 2017 in the USA. **Results:** The study included 11,918 participants. 2.8% were current e-cigarette users, 11.2% were former e-cigarette users and 85.7% had never used e-cigarettes. In the multivariable model we found significant interactions between marital status, employment status, marijuana use, poverty level, sexual orientation, and e-cigarette use on depression. Among individuals belonging to 'Other' marital status category, the odds of depression were higher among both former and current e-cigarette users compared with non-users. (Former: aOR 1.55, 95% CI 1.03 – 2.34; current: 2.37, 1.20 – 4.69). Among those unemployed, the odds of depression were higher among current e-cigarette users compared to non-users (aOR 2.85 (1.63, 4.97). Among marijuana users, the odds of depression were higher as well (1.68, 95% CI 1.09 – 2.61). **Conclusion:** E-cigarette usage has increased over the past 5 years, especially in adolescents. E-cigarettes pose several documented health risks to the user. The findings help to identify at-risk populations to provide targeted interventions.

B64 Title: The Association of ABO Blood Groups and Trauma Outcomes

Authors: Michael Sauder, BA (OMS-II)¹; Timothy W. Wolff, DO²; M. Chance Spalding, DO, PhD²; Urmil B. Pandya, MD²

Affiliations: ¹Ohio University Heritage College of Osteopathic Medicine, Dublin, Ohio; ²OhioHealth Grant Medical Center, Division of Trauma and Acute Care Surgery, Columbus, Ohio

Introduction: Certain ABO blood types have been identified as risk factors for numerous disease processes. However, there is a relative paucity of literature regarding the implications of ABO blood type on outcomes of traumatically injured patients. A 2018 study concluded that blood type O was associated with higher mortality in severely injured patients in Japan. **Objectives:** The purpose of this study was to determine the association of ABO blood types with outcomes in traumatically injured patients in the United States. **Methodology:** This retrospective study evaluated all patients involved in category 1 and 2 trauma alerts at an urban, Level 1 trauma center from 1/1/2017 – 12/31/2017. Patients were excluded if they were pregnant, less than 16 years old, or if blood type data was unavailable. Recorded outcomes included: ABO blood group, mortality, Injury Severity Score (ISS), race, ventilator days, mechanism of injury, and complications. Data analysis was performed using chi-squared and analysis of variance (ANOVA) calculations. **Results:** A total of 3,779 patients met inclusion criteria. In our sample, blood type AB was associated with a statistically significant increase in mortality rate in severely injured (ISS>15) Caucasian patients compared to non-AB blood types (39% vs. 16%; p=0.01). This relationship was not consistent amongst African-American patients (p=0.37). **Summary/Conclusion:** Blood type AB is associated with increased mortality in severely injured Caucasian patients. This is in contrast to findings in Japanese and African American patients. Though this requires further validation, there is a potential correlation between ABO blood type, ethnicity, and trauma outcomes.

B65 Title: Differences in Child Psychosocial Functioning According To Diabetes and Weight Status

Authors: Meghan Schulze, BA (OMS-II); Emily Guseman, PhD; Jonathon Whipps, MS; Maria Englert; Elizabeth A Beverly, PhD

Affiliation: Ohio University Heritage College of Osteopathic Medicine, Athens, Ohio

Introduction: Children with diabetes may experience greater psychosocial difficulty than children without chronic diseases, however less is known about how this varies according to weight status. **Objectives:** The purpose of this study was to evaluate differences in child psychosocial functioning among children with type 1 diabetes (T1D) in comparison to overweight and obese children. **Methodology:** Parents of children age 2-17 years were invited to participate in this online survey study. Parents reported child demographics, chronic disease diagnoses, body size, and completed the parent version of the 35-item Pediatric Symptom Checklist (PSC). Children were classified into 4 groups based on diagnosis of T1D, and then according to BMI percentile. ANOVA was used to compare PSC total score and internalizing, externalizing, and attention subscales between groups. Multiple regression was used to examine the contribution of T1D diagnosis, age, gender, and BMI percentile to PSC total score. **Results:** A total of 133 children were included in the analysis (mean age 9.7 + 3.1 years, 48.9% girls). PSC total score was highest among children with T1D (54.25 + 17.9) followed by children with obesity (48.1 + 16.6), comparison (46.6 + 12.4), and overweight children (43.8

+ 14.0); however, these differences did not reach statistical significance. The strongest predictor of PSC total score was T1D (unstandardized B = 9.4; p=0.03). **Conclusion:** No differences were found in psychosocial functioning among this sample. Trends in the data suggest that the presence of T1D may be associated with worse psychosocial functioning. However, additional studies are needed to confirm.

B66 Title: Is Mesh Necessary?

Authors: Kathryn Schwalbe, DO (PGY-1); Alex Myers (OMS-IV)²; Mary Karneval, DO¹

Affiliations: ¹Cleveland Clinic South Pointe Hospital, Warrensville Heights; ²Ohio University Heritage College of Osteopathic Medicine, Athens, Ohio

Introduction: In the United States, lawsuits involving complications related to hernia mesh have gotten the attention of the public, leading to the question, "Is Mesh Necessary?" Inguinal hernia surgery is one of the most frequently performed surgeries in the United States. Repair of inguinal hernia can be achieved with a mesh repair or a non-mesh repair. Both types of repair have been studied extensively. **Case Series Description:** In 2018, 42 unilateral inguinal hernia repairs were done by one surgeon at a 187-bed community hospital. 11 of the cases were non-mesh repairs. For 10 of these cases, at initial \leq 30 day follow up there was no evidence of recurrence or wound complication. A subsequent telephone follow-up survey was completed. **Discussion:** In this series of patients, the overall complication rate is low in short-term follow-up. Many studies conclude that mesh repair is superior, however, non-mesh repair remains a viable option as long as risks of recurrence are understood. Several peer-reviewed articles exist accounting for the viability of non-mesh repair. **Conclusion:** Patients who have had non-mesh repair report favorable outcomes. Non-mesh repair is acceptable and frequently performed. One standard repair technique for all groin hernias does not exist. It is advisable that options for repair including open (with or without mesh) and laparoscopic repair be available to the patient. Patients and surgeons should have a solid understanding of the risks and benefits of mesh, non-mesh and laparoscopic hernia repair.

B67 Title: Reducing Emergency Department Visits

Authors: Savannah Seignuer, BA (OMS-II)¹; Stephen Cardamone, DO²; Dane Snyder, MD²; L. Mihalov, MD²; Jessica Retzke, MD²; Gina Thompson, MD²; Jeanne Wickliffe, RN, MHA²; Craig Soller, MBA²; Melissa Mangini, MS²; Brent Barkett, MBA²

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Published evidence supports that parents' decision to visit the Emergency Department is reliant on two reasons: the severity of their child's illness and the need for increased access to sick care at their primary care providers' office. Because of the overwhelming number of patients with ambulatory conditions frequenting the Emergency Department at Nationwide Children's Hospital, a research team from the accountable care organization Partners for Kids intervened to decrease this number. The specific aim of the initiative is to decrease the percentage of ED visits for targeted ambulatory sensitive conditions per month for the NCH Primary Care Network attributed patients from 24%-18% by 12/31/19 and continuously improve. A PDSA change cycle was implemented to determine the reasons for ED use and methods to decrease ED utilization. Evidence from a Paretochart determined the most common ambulatory sensitive conditions for which people visit the ED to be URI, Otitis Media, Asthma, and Skin/Soft Tissue. The team implemented more open access walk-in sick clinics throughout Columbus, Ohio and allowed for more continuity of care by assigning a specific Primary Care Physician to each child. Overall, 40% of the patients with ambulatory sensitive conditions were visiting the same-day sick clinic, compared to only 26% before implementation. In addition, 12% of ED visits were attributed to patients that were assigned a PCP, and 25% were attributed to those without that continuity of care. The quality of patient care and efficiency of the ED was significantly increased due to these essential changes.

B68 Title: Reviewing Disasters: Hospital Evacuations in the United States from 2000-2017

Authors: Aishwarya Sharma, BS, BA, AS, AA (OMS-III)¹; Sharon Mace, MD, FACEP, FAAP²

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Introduction: Between 2000 and 2017, there were 150+ hospital evacuations in the United States. Data received from approximately 35 states was primarily concentrated in California, Florida, and Texas. This analysis will provide disaster planners and administrators statistics on hazards that cause disruptions to hospital facilities. **Objectives:** The aim of this study is to investigate US hospital evacuations, compiling the data into external, internal, and man-made disasters; thus, creating a risk assessment for disaster planning. **Methodology:** Hospital reports were retrieved from Lexis Nexis, Google, and PubMed, and categorized according to evacuees, duration, location, and type. These incidents were grouped into three classifications: external, internal, and man-made. **Results:** There were a total of 154 reported evacuations. 71% due to external threats, followed by 16% man-made threats, and 13% internal threats. Assessing the external causes, 55% attributed to hurricanes, 19% wildfires, and 7% storms. From the internal threats, 40% attributed to hospital fires and 20% chemical fumes. From the man-made threats, 40% attributed to bomb threats and 27% gunmen. From the 20 total reported durations of evacuations, 45% lasted between 2 to 11:59 hours, 30% lasted over 24 hours, and 25% lasted up to 1:59 hours. **Summary:** Over 70% of hospital evacuations were due to natural disasters. Compared to 1971-1999, there was an increase in internal and man-made threats. Exact statistics on evacuees, durations, and mortality rates were unascertainable due to a lack of reporting. It is critical to implement a national registry to report specifics on incidences to assist with disaster and infrastructure planning.

B69 Title: The Relationship between Mental Health Status of Caregivers and Childhood Flourishing in the US

Authors: Lindsey Snider, BS (OMS-II); Bhakti Chavan, MPH, MBBS; Zelalem Haile, PhD, MPH

Affiliations: Ohio University Heritage College of Osteopathic Medicine, Dublin, Ohio

Introduction: Previous studies have identified several factors that influence childhood flourishing. However, research examining the relationship between caregiver's mental health and childhood flourishing is presently lacking. **Objectives:** The primary aim of this study was to examine the association between mental health of caregivers and childhood flourishing in the US. Additionally, we examined differences in the relationship between mental health of caregivers and childhood flourishing by caregiver and child characteristics.

Methodology: This is a cross-sectional study using secondary data from the 2016 National Survey of Children's Health (NSCH) in the US. The sample included 41577 caregivers age 18- 75 who had complete data on variables assessed in the current study. The outcome measured is childhood flourishing, defined by whether or not child's caregiver responded "definitely/somewhat true" to each of the four measures of flourishing. **Results:** Overall, 28.2% children met each of the four measures of flourishing and 20.2% caregivers had fair/poor mental health. After adjusting for potential confounders, there was a significant interaction between caregiver's mental health, child's overall health, race/ethnicity, and education on childhood flourishing. **Conclusions:** The relationship between caregiver mental health and childhood

flourishing is moderated by a child's overall health, race/ethnicity and education. It is critical to identify at-risk children and provide targeted interventions.

B70 Title: Exploring the Role of Autophagy in NAFLD as it Pertains to Diabetes Mellitus

Authors: Ryan Stefancik, BS (OMS-III); Lewis Watson, PhD

Affiliation: University of Pikeville Kentucky College of Osteopathic Medicine, Pikeville, Kentucky

Introduction: Diabetes Mellitus Type II (DM2) is highly associated with Non-Alcoholic Fatty Liver Disease (NAFLD), and though closely related, the pathways are not well understood. One demonstrated commonality between them is autophagy, the cellular process responsible for the breakdown and removal of non-essential cellular components. Our research works on differential regulation of autophagy and its contribution to NAFLD development in *Drosophila* livers (oenocytes) in flies with DM2. **Objectives:** This proposal seeks to shed light on the role of autophagy in NAFLD development in the framework of *Drosophila* induced with DM2. **Methodology:** Atg7 is a specific that severely inhibits autophagy without affecting *Drosophila* viability. Utilizing publicly available genetic knockouts and the UAS-Gal4 system, we analyzed DM2 flies with the deletion of *Atg7* isolated to oenocytes, comparing the survival rates and lifespan of this line with *Atg7* inhibited throughout the whole body. **Results:** We found a dramatic loss of survival using *Atg7* to disable the function of autophagy in the oenocytes. However, a high sugar diet (HSD) mitigated this response, raising the survival rate to that of the wild type. **Summary/Conclusion:** Based on our data we believe autophagy to be a necessary biologic function much more important specifically to the oenocytes than the entire body, and that a HSD is able to overcome this. This study shows a connection between DM2 and oenocyte autophagy processes. Moving forward this lab will stain oenocytes from these lines to look at fat composition and cell structure to examine if it matches the development of NAFLD.

B71 Title: Comparison of Stress Fractures to Foot Strike Pattern

Authors: Adam Stefaniak, DO (PGY-3)

Affiliation: OhioHealth Doctors Hospital Family Medicine Residency, Columbus, Ohio

Introduction: Stress fractures of the lower extremity are one of the most common injuries in runners. Runners generally maintain one-of-three-foot strike patterns, rearfoot, midfoot, and forefoot. Based on landing patterns, each have a different vertical loading rate. Higher vertical loading forces are correlated with stress fractures. The vast majority of recreational or sub-elite runners have a rearfoot strike pattern, versus midfoot or forefoot patterns. **Objective:** The purpose of the study was to correlate the presence of stress fractures with the foot-strike pattern. **Methods:** A retrospective chart review of patients between the ages of 16-70 who had a lower extremity stress fracture and were evaluated at MAX Sports Runner's Clinic. **Results:** A greater proportion of patients with a stress fracture had rear foot strike pattern versus midfoot or forefoot patterns. Patients with a forefoot and midfoot landing pattern had a higher incidence of a foot fracture when compared to patients who had a rearfoot landing pattern in which tibia fractures were much more common. Statistical comparison or correlation analysis could not be performed due to small sample size. **Summary:** This study describes the location of fracture and foot strike pattern seen in runners when they were evaluated at a community health system runner's clinic. Our results indicate that the most patients with a history of a stress fracture run with a rearfoot strike pattern and had tibial stress fracture. A better understanding of injury risk factors may facilitate behavior modification to reduce the risk of primary or recurrent stress fractures.

B72 Title: Effects of an Increased Emphasis on Resident Education Regarding Operative Vaginal Deliveries on Maternal and Fetal Outcomes

Authors: David Sullivan, BS (OMS-II)¹; Sarah Clausen, MD²; Connie Cottrell, PhD²; David Biats, DO²

Affiliation: ¹Ohio University Heritage College of Osteopathic Medicine, Athens, Ohio; ²Cleveland Clinic Akron General Hospital, Akron, Ohio

Introduction: Operative vaginal deliveries (OVD) are vaginal deliveries using forceps or vacuum extraction for either maternal or fetal indications. Current OVD rates are substantially lower than they were for obstetricians retiring in the near future. The success of an OVD is dependent on the skill and training of the operator, and inadequate training has been identified as a key contributor to adverse outcomes. **Objectives:** We aim to determine if increased emphasis on resident education regarding OVDs significantly decreases the rates of maternal and fetal adverse outcomes. **Methodology:** We conducted a retrospective, single center chart review evaluating the incidence of fetal and maternal complications after OVDs before and after implementation of a residency training program focusing on forceps and vacuum deliveries in patients admitted to Cleveland Clinic Akron General labor and delivery unit. The study covered the periods between Jun 2012 - Jul 2013 (pre-training) and Jan 2017 - Sept 2017 (post-training). **Results:** 236 charts from the pre-training period and 212 charts from the post-training period were analyzed. There was a significant decrease in maternal complications from forceps delivery in the post training group (19.5% vs 11.5%). There was also a significant increase in the percentage of OVDs performed for cases of fetal distress, shoulder dystocia and maternal medical disorder. **Summary/Conclusion:** Increased emphasis on OVDs in resident education helped decrease the maternal and fetal complication rates, and brought them below the national average. It also increased the rates of OVDs in scenarios where a C-section would have been otherwise performed.

B73 Title: ALS blood expression profiling identifies new biomarkers, patient subgroups, and evidence for neutrophilia and hypoxia

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Affiliation: ¹Ohio University Heritage College of Osteopathic Medicine, Athens, Ohio; ²Ohio University Department of Environmental and Plant Biology, Athens, Ohio; ³Ohio University Edison Biotechnology Institute, Athens, Ohio ⁴Ohio University Diabetes Institute, Athens, Ohio

Introduction: Amyotrophic lateral sclerosis (ALS) is a debilitating disease with few treatment options. Progress towards new therapies requires validated disease biomarkers, but there is no consensus on which fluid-based measures are most informative. **Objectives:** Goals were to provide in-depth analysis of differentially expressed genes (DEGs), characterize patient-to-patient heterogeneity, and identify candidate biomarkers. **Methodology:** This study analyzed microarray data derived from blood samples of patients with ALS ($n = 396$), ALS mimic diseases ($n = 75$), and healthy controls ($n = 645$). **Results:** We identified 752 ALS-increased and 764 ALS-decreased DEGs (FDR < 0.10 with > 10% expression change). Gene expression shifts in ALS blood broadly resembled acute high altitude stress responses. ALS-increased DEGs had high exosome expression, were neutrophil-specific, associated with translation, and overlapped significantly with genes near ALS susceptibility loci. Random forest models distinguished ALS patients from ALS mimics and controls with 81% accuracy (sensitivity: 80%, specificity: 82%). Expression profiles were heterogeneous among patients and we identified two subgroups (myeloid/IL6R+ and lymphoid/IL23A+). We identify a 61 gene signature that significantly improves survival prediction when added to Cox proportional hazard models with baseline clinical data (i.e.,

age at onset, site of onset, sex). **Conclusion:** Peripheral blood analysis informs our understanding of ALS disease mechanisms and genetic association signals. Our findings are consistent with low-grade neutrophilia and hypoxia as ALS phenotypes, with heterogeneity among patients partly driven by differences in myeloid and lymphoid cell abundance. Biomarkers identified in this study require validation but may provide tools for research and clinical practice.

B74 Title: Women in Service Project: Servicewomen's Support Study
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Introduction: In 2013, the Combat Exclusion Policy which prohibited women from participating in direct combat was lifted, paving the way for integration of servicewomen in direct combat units, which was completed in 2015. Prior to this integration, however, women were exposed to combat, particularly during Operation Enduring Freedom (OEF) and Operation Iraqi Freedom (OIF). Little research has been conducted to identify the stressors *particular* to the female veteran with direct combat experience due to previous exclusion. During 2011, women in Cultural Support Teams (CSTs) were integrated with direct combat action units. This provides an opportunity to learn, discuss, and derive recommendations that may assuage the incidence of PTSD of future female combat veterans. **Objectives:** We aim to conduct research with 575+ female veterans to gain insight into stressors for the female veteran with extensive combat experience with an emphasis on effects on mental health. **Methodology:** Phase I – A comprehensive survey will be circulated to over 575 CSTs to identify discontinuities and systemic failures in treating female combat veterans. A response rate of 200 is desired. Phase II – Focus groups will be conducted to further identify additional stressors and post deployment issues with female veterans. **Results:** Results are pending completion of the phases of the study. **Summary/Conclusion:** As over 1000 women have now been recruited for combat specific roles, it is hoped that this information will provide meaningful interactions with female veterans as well as future recommendations that can be utilized for potential future PTSD mitigation, and improved treatment modalities of female combat veterans.

B75 Title: Diagnosis and Management of Malingering in Psychosis
Authors: Ingrid Walfish, DO¹ (PGY-3); Tressa Socker, DO, MA¹; Heather Theibert, DO¹; Stephen L Scott, DO¹; Brendan T Carroll, MD²
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Introduction: Malingering is defined as intentional presentation of feigned or false physical or psychological symptoms for external gain. Research estimates 13% of those presenting to the emergency department are malingering.² However, even with its common presentation, malingering is difficult for psychiatrists to discern. The importance of diagnosing malingering is greater than ever with increasing healthcare costs.³ Therefore, knowing the presentation of malingering and common symptoms of both feigned and true psychosis are crucial to understanding and distinguishing between malingering and genuine psychosis. Moreover, the appropriate management of these patients is vital for the proper care of malingering patients and the appropriate distribution of resources in the current healthcare system. **Objectives:** Discuss symptoms seen in genuine psychosis and malingered psychosis, present interview techniques for psychiatrists when malingering is suspected, and describe management of patients who present with malingering. **Methodology:** A survey of literature discussing malingering in psychosis was conducted, relying on review papers. Symptoms indicative of malingering and true psychosis were collected and presented. Additionally, interview procedures were gathered and streamlined for presentation. Lastly, goals for management were found and organized as a guide for treatment. **Results:** Conclusive and detailed guides were produced indicating common symptoms of feigned and genuine psychosis as well as interview strategies and management for patients with malingered psychosis. **Summary/Conclusion:** The goal of this research was to develop guidelines for psychiatrists for identification and management when malingered psychosis is suspected. With these guidelines, the treating psychiatrist can make educated decisions with this difficult patient population.

B76 WITHDRAWN

B77 Title: Spinal Anesthesia is Associated with Decreased Complications Following Total Knee and Hip Arthroplasty
Authors: Jared Warren, DO; Sundaram Kavin, MS, Msc; Anis Hiba, MD; Nicolas S. Piuze, MD
Affiliations: Cleveland Clinic Foundation, Cleveland, Ohio

Introduction: The purpose of this study was to compare 30-day post-operative outcomes between patients undergoing spinal anesthesia (SA) and general anesthesia (GA) for total knee arthroplasty (TKA) and total hip arthroplasty (THA). **Objectives:** We compared the following 30-day outcomes: (1) mortality, (2) major and minor complication rates, (3) increased hospital length of stay (LOS), and (4) discharge disposition. **Methods:** The American College of Surgeons National Surgical Quality Improvement Program (NSQIP) database was used to identify patients who underwent TKA and THA from 2008-2016. Of the 110,963 eligible THA patients, 41% (n=45,871) of the patients underwent SA, while 65,092 underwent GA. Of the 183,080 TKA patients, (44%) (n=80,077) of the patients underwent SA, while 103,003 (56.3%) patients underwent GA. Multivariate logistic regression was performed to evaluate associations between anesthesia type and 30-day outcomes after adjusting for baseline demographic and comorbidity variables that were significantly different between the groups. **Results:** Anesthesia modality was not associated with 30-day mortality for neither THA nor TKA (p>0.05). Regardless of procedure the GA cohorts were at a greater risk for any complication, any major complication, and any minor complication (p<0.05). No clinically relevant increase was found in LOS for both TKA and THA. Both THA and TKA patient who received GA were at an increased risk for non-home discharge. **Conclusion:** After accounting for confounders including comorbidities and demographic factors, patients who undergo total joint arthroplasty with SA experience fewer 30-day complications and are less likely to have a non-home discharge than those with GA.

B78 Title: Nutritional Status of Recovering Heroin Addicts in Inpatient Treatment
Authors: Sana Waseem, DO (PGY-3); Katherine Chen, DO; Lokesh Goyal, DO; Michael Dietz, DO; Isaac Navarro, DMD, MPH
Affiliations: The Wright Center National Family Medicine Program, Cincinnati, Ohio

Introduction: As a result of the national heroin epidemic, with Ohio being one of the top 5 states with opiate related deaths, CHCs are seeing more patients struggling with drug abuse. There is currently very limited data on the nutritional status of people with drug addictions. Given this current growing problem, we designed this study to assess the baseline nutritional status of patients that are enrolled in an inpatient drug rehabilitation, as well as to assess for any health trends within this population. **Objectives:** To assess the baseline nutritional status of patients that are enrolled in an inpatient drug rehabilitation, as well as to assess for any health trends within this population. **Methodology:** We focused on males in inpatient treatment for IV drug abuse. We also assessed whether certain health factors improved while receiving treatment. The

study was conducted over 2 years in conjunction with the Adams Recovery Center and HealthSource of Ohio, where we followed 30 patients enrolled in inpatient drug treatment. We were able to obtain data, including objective and subjective measures, via labs and surveys, to accomplish this. **Results:** We found various health trends within this population, including a high prevalence of Hepatitis C, Vitamin D deficiency, low to normal BMI and elevated liver enzymes that often improved (lowered) while in inpatient treatment. We also found a significant self-awareness of these patients for having poor health, as assessed with surveys, which also improved while in treatment. **Summary/Conclusion:** Our short term study has shown a great prevalence of Hep C in this community, which seems to be on the rise, compared to national averages. We also saw a surprising self-awareness of these patients of their own health while in treatment. There is still more to be done to assess the nutritional status of recovering heroin users, especially the long term effects on their health

B79 Title: Effect of Legislation on Opioid Use in Foot and Ankle Surgery
Authors: Brent Whitehead, BS (OMS-II)¹; Jason Lauf, BS; Connor Yancey, BS; Adam Rabe, BS¹; Joseph Long, BS²; Nicholas Cheney, DO³; Kaitlyn Schimmoeller, PA³; Timothy Law, DO, MBA¹
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Introduction: Opioid medications are a pressing matter in light of the rapid rise of linked overdoses and deaths. Ohio passed legislation on August 31, 2017 that limits the number of opioids a physician can prescribe a patient. **Objective:** Our study aimed to analyze the prescribing trends of an orthopedic surgeon practicing in central Ohio. **Methodology:** We retrospectively reviewed charts of patient's, who underwent procedures for ankle fractures, flat-feet, bunions, Achilles tendonopathy, ankle instability, and total ankle arthroplasty. Roughly 1,850 patients met the criteria, and were subsequently split into pre- and post-law change groups. We analyzed the average number of pills and sum of different medications prescribed (pill score) per person by condition and location; as well as the total number of pills prescribed by condition and location. T-tests by condition were performed using SAS. **Results:** We found a statistically significant reduction in the pill score from before the legislation change to after the legislation change in the bunion ($p=0.001$) and ankle instability ($p<0.001$), ankle fracture ($p=0.011$), and flat-foot ($p=0.035$) patient populations. The total numbers of pills were statistically different in the ankle fracture ($p=0.001$), flat-feet ($p=0.004$), Achilles ($p<0.001$), bunions ($p<0.001$), ankle instability ($p=0.001$) subsets. **Conclusion:** To our understanding, no such study has been completed up to this point. We can conclude that Ohio's law change has had a strong effect on reducing opioid prescriptions after orthopedic foot and ankle surgeries. Further research should be done looking at larger subsets of the Ohio population to fully elucidate the effect of the recent change.

B80 Title: Incidence of Intraoperative Hypotension in Acute Traumatic Spinal Cord Injury and Associated Factors
Authors: Jacob Wochna, BS (OMS-III)¹; Xavier P Gaudin, DO²; Timothy W Wolff, DO³; Sean M. Pugh¹; Urmil B. Pandya, MD³; M. Chance Spalding, DO, PhD³; Kailash K Narayan, MD²
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Introduction: Maintaining mean arterial pressure (MAP) greater than 85 mmHg for patients with acute spinal cord injury (SCI) is vital, since hypotension increases risk of secondary cord injury. Current literature focuses on the intensive care unit (ICU) setting, however, there is a paucity of data describing MAP changes in the operating room (OR). **Objective:** Identify incidence of intraoperative hypotension among patients with SCI. **Methods:** Retrospective study from 2015 to 2016. All patients with ASIA score A to D acute traumatic SCIs from C1 to L1 were identified. Associated factors include: age, mechanism of injury, injury severity score, level of cord injury, ASIA score, day of surgery, total OR time, laminectomy, spinal fixation, positioning, blood loss, length of stay, and discharge disposition. **Results:** Thirty-two patients underwent 33 operations. Relative to total OR time, patients spent an average of 51.9% of their cumulative time with a MAP under 85 mmHg. Furthermore, 100% of our cases recorded at least one MAP measurement under 85 mmHg. These hypotensive episodes lasted a mean of 103 cumulative minutes per case. Fall MOIs led to a significant increase in intraoperative hypotension compared to MVC/MC ($p=0.033$). All other associated factors demonstrated no significant differences in MAP recordings. **Conclusion:** This is the first study reporting the incidence of intraoperative hypotension for patients with SCIs, and we identified higher proportions of relative hypotension than previously documented in the ICU. Given our results, adherence to MAP protocol intraoperatively needs to be improved to minimize the risk of secondary cord injury and associated deleterious neurological outcomes.

B81 Title: Analysis of Patient Outcomes Receiving a REBOA in the First 24 Months at a Level 1 Trauma Center
Authors: Timothy Wolff, DO (Fellow); Elizabeth Naber, MSN, RN, CCRN, CNRN; Urmil Pandya, MD; M. Chance Spalding, DO, PhD
Affiliation: OhioHealth Grant Medical Center, Doctors Hospital, Columbus, Ohio

Introduction: Resuscitative Endovascular Balloon Occlusion of the Aorta is an emerging tool for trauma surgeons for the acute resuscitation of patients in hemorrhagic shock. Research from well-established REBOA programs unfortunately fails to outline expectations for new programs. **Objective:** To report our preparation and initial experience of a team-based REBOA program at an urban Level 1 trauma center to provide comparisons for similar centers. **Methodology:** Two trauma surgeons attended the Basic Endovascular Skills in Trauma (BEST) course and, with a nurse educator, subsequently trained the remaining ED, OR, and ICU staff using didactics, high-fidelity simulation, and structured debriefing. REBOA attempts for the first 24 months were reviewed for indication, efficacy, technical error, access proficiency, aortic occlusion time, and complications. Mortality was the primary outcome assessed. **Results:** Six trauma surgeons placed 31 REBOA catheters (mean ISS-31, GCS-6, HR-90, SBP-62) for penetrating (5, 16%) and blunt mechanisms (26, 84%). Patient GCS, pre-REBOA arrest, CFA access, and outcome differed significantly between months 1-12 and 13-24. In-hospital mortality (52.6%) was significantly different between each 12 month period (77% vs. 33%, $p<0.05$). Complications consisted of access site hematoma in 2 cases and a CFA pseudoaneurysm in 1 case that resolved with manual pressure. **Conclusion:** We successfully implemented a REBOA program utilizing the principles and techniques of the BEST course and placed 31 catheters in 24 months without any complications requiring intervention. Over time, patient selection differed, access quickened, and survival significantly improved. These results can assist newly-established REBOA programs in predicting early outcomes, patient selection, and likely obstacles.

Case Study Competition Abstracts

- C1 Title:** Hydroquinone-Induced Hyperpigmentation: A Case of Exogenous Ochronosis
Authors: Natasha Baah, BS (OMS-III)¹; George Skandamis, MD, FAAD²
Affiliation: ¹Ohio University Heritage College of Osteopathic Medicine, Dublin, Ohio; ²Universal Dermatology & Vein Care, Columbus, Ohio

Introduction: Exogenous Ochronosis (EO) is rare but serious complication of hydroquinone (HQ), a topical bleaching agent used in medically treating hyperpigmented skin or cosmetic "skin whitening". EO is a localized and paradoxical cutaneous disorder characterized by diffuse, symmetrical, asymptomatic hyperpigmentation over the face and neck. **Case Description:** A.G. is a 61-year-old female with Fitzpatrick skin type IV who presents with tan to dark-brown ill-defined bilateral hyperpigmented patches on the chin and mild to moderate upper lip and cheek hyperpigmentation. She developed asymptomatic areas of pigmentation changes over the past six months after using various concentrations of HQ (2-5%) twice daily for two years continuously on the face for cosmetic reasons without any concerns. A.G. consulted her family physician, was diagnosed with mild melasma, and was told to continue using HQ. The pigmentation worsened and now HQ use time is reaching three years. She indicated no sunscreen protection. **Discussion:** HQ inhibits enzymatic conversions of tyrosine to DOPA (dihydroxyphenylalanine) which decreases the number of melanocytes and melanin transfer leading to lighter skin. Although the exact mechanism of EO is unknown, EO is histologically defined by yellow- brown, curvilinear, "banana-shaped" ochre or yellow dermal deposits and in its severe form presents as blue-black skin. Use of HQ requires sunscreen protection and must be carefully monitored for frequency and duration. **Conclusion:** HQ's paradoxical effect of EO is an important adverse reaction that should not be neglected by clinicians and consumers. It imperative that adequate patient education on HQ- containing products, prescription and over-the-counter, be addressed both clinically and as a society.

- C2 Title:** Clinical Presentation, Diagnosis and Treatment of Juvenile Dermatomyositis
Authors: Nisarg Bakshi, BS (OMS-III)¹; Robert Myers, DO²; Corey Davis, NP²
Affiliation: ¹Ohio University Heritage College of Osteopathic Medicine, Dayton, Ohio; ²Contemporary Pediatrics, Dayton, Ohio

Juvenile Dermatomyositis (JDM) is an autoimmune condition in which fatty tissue infiltrates the epimysium, or the sheath enveloping muscle fibers, and keratinocytes in the dermis. Classically, JDM presents with a pathognomic rash called Gottron's papules: multiple, hyperkeratotic, erythematous, flat papules with central atrophy, typically on the dorsum of the intercarpal and metacarpal phalangeal joints. Untreated, JDM will infiltrate every muscle in the body, leading to paralysis and respiratory arrest. We report a 2-year-old female who presented with a limp and was initially diagnosed with transient synovitis, then to the emergency room where she was diagnosed with post-viral myositis. Ultimately, the diagnosis of JDM was made via muscle biopsy. While there are criteria for diagnosing JDM, the clinical manifestation of this condition can vary greatly, particularly in younger patients. A limp in children must be investigated for acute causes such as septic arthritis, fracture, osteomyelitis, osteodystrophy, and bone malignancy. Treatment is typically immunosuppressive therapy such as steroids, methotrexate, and cyclosporine. Early immunosuppressive treatment is key in preventing severe complications such as respiratory arrest, osteoporosis, calcinosis, and intestinal perforation, however, varying clinical manifestations of this disease present a challenge to prompt diagnosis.

- C3 Title:** Simultaneous appendicitis and acute cholecystitis
Authors: Elsworth Beach, DO, MS (PGY-3); Paul Ferraro, DO; Walter Chlysta, MD
Affiliation: Western Reserve Hospital, Cuyahoga Falls, Ohio

Introduction: Appendicitis and cholecystitis are very common diseases. In the United States alone there are over 1 million appendectomies and cholecystectomies performed each year.

In the setting of multiple abdominal pathologies laparoscopy is invaluable. In both patients described in this case report there was a dominating diagnosis and a secondary concern for another infection in another organ. This case report highlights two different patients with simultaneous acute appendicitis and cholecystitis. My poster will talk about the similarities and the differences between the two cases as well as highlight and discuss the port placements used for each patient and the possible advantages and disadvantages of each. **Discussion:** The techniques employed during these cases varied greatly and were highly impacted by the initial organ of interest. Patient #1 was able to go home postoperative day one without any issues. Patient #2 had a more complicated postoperative course, requiring an endoscopic retrograde cholangio-pancreatography (ERCP) for a retained common bile duct stone as well as PICC line thrombus. Despite these complications, the patient improved and was discharged home on postoperative day seven. Both patients greatly benefited from a laparoscopic approach as opposed to the more traditional midline incision. **Conclusion:** The advantages of laparoscopic surgery have numerous benefits. The cases shown here today not only represent a rare occurrence and different operative techniques but also emphasize the flexibility and versatility of laparoscopic surgery. Laparoscopic approaches for multiple simultaneous abdominal pathologies his an advantage to both patient and surgeon.

- C4 Title:** An Unusual Etiology of Altered Mental Status: A Case Report of Ischemic Stroke Involving Artery of Percheron
Authors: Nicholas Berry, DO (PGY-1); Jordan Luli, DO; Jeff Sobocki, DO
Affiliation: Doctors Hospital, Columbus, Ohio

Introduction: Altered mental status (AMS) is a common emergency, but the etiology of many AMS patients is unknown. Occlusion of the artery of Percheron (AOP) is rare, causing bilateral thalamic ischemic stroke with or without midbrain involvement. It is the result of an anatomical variant of the diencephalic irrigation, in which the thalamic paramedian arteries arise from a common trunk from the PCA. The result, a clinical syndrome characterized by bilateral vertical gaze palsy, memory impairment and hypersomnia. **Case presentation:** 79-year-old female is very difficult to arouse and actively snoring. CT-head, VBG and labs are unremarkable. Following admission, a rapid response was called for AMS. Patient was difficult to arouse even with noxious stimuli. Repeat CT-head was unremarkable. Neurology was consulted and ordered a MRI and EEG. MRI showed an ischemic stroke involving the medial aspects of bilateral thalami extending into the midbrain. She continued to have waxing and waning spells of being unarousable but would always regain consciousness. While inpatient she was found to have afib which was likely the etiology of this rare ischemic stroke. **Discussion:** Occlusion of the AOP is a rare presentation of AMS. R worldwide. 3 4 AMS with hypersomnia and stroke risk factors should prompt consideration for an ischemic stroke of the AOP. **Conclusion:** This case demonstrates the importance of considering various etiologies of AMS. Paying attention to neurological exam findings including hypersomnia resulted in the effective management of this patient.

- C5 Title:** Right Atrial and Right Ventricular Thrombus in Transit: A Rare Capture
Authors: Jasyn Blankenship, DO (PGY-2); Daniel Goldbach, DO; Rayan El-Zein, DO
Affiliations: OhioHealth Doctors Hospital, Columbus, Ohio

Introduction: Pulmonary embolism (PE) is often due to transition of thrombi from the peripheral to the central venous system. The rare capture of this transition provides a window for intervention; with an associated mortality reduction. We present a case of disappearing right atrial (RA)

and right ventricular (RV) thrombus, indicative of 'thrombus in transit' phenomenon. **Case Description:** A 78 y.o. male presented with complaint of fall. History included atrial fibrillation for which he was not on anticoagulation due to history of gastrointestinal bleeding. The patient was hypotensive and hypoxic on arrival; requiring vasopressor support and supplemental oxygen. Physical exam displayed lower extremity edema and a systolic murmur over the left sternal border. Ultrasound identified multi-vessel deep venous thrombosis of the lower extremities bilaterally. CT imaging revealed extensive bilateral pulmonary emboli; heparin infusion was initiated. Echocardiography revealed a 2cm x 7cm, mobile thrombus which extended from the RA into the RV. The patient was immediately transferred to a tertiary facility for evaluation for thrombectomy. Repeat echocardiography revealed no thrombus. Tenecteplase was given. The patient slowly recovered and was discharged weeks later. **Discussion:** Transition of thrombus from the lower extremity to the pulmonary vasculature was evidenced by disappearance of the thrombus on echocardiography. This negated the utility of thrombectomy. Systemic thrombolytic therapy was then chosen as the treatment. **Conclusion:** The case provides an objective demonstration of thrombus transition through the right heart. It emphasizes the importance of prompt recognition and intervention of thrombus in transit; which can reduce mortality.

C6 Title: Prompt diagnosis leading to successful endovascular treatment of acute mesenteric ischemia with percutaneous embolectomy

Authors: Jenna Botysm, DO (PGY-4)

Affiliations: OhioHealth Doctors Hospital, Columbus, Ohio

Introduction: Acute mesenteric ischemia (AMI) is due to sudden loss of blood flow to the abdominal viscera. Standard intervention is emergent laparotomy to inspect visceral viability and restore vascularization. The following case demonstrates endovascular intervention using aspiration and mechanical thrombectomy in a case of AMI with successful outcomes, avoiding bowel ischemia and laparotomy. **Description:** A 74 year old female with atrial fibrillation presented with acute abdominal pain. CT angiogram demonstrated two occlusions of the proximal branches of the superior mesenteric artery (SMA). Using percutaneous access, the SMA was cannulated and a combination of aspiration and mechanical thrombectomy was successfully performed. Post operatively, the patient had immediate resolution of her abdominal pain and her post-operative course was unremarkable. **Discussion:** AMI is a surgical emergency and without prompt diagnosis and treatment can lead to bowel infarction, septic shock, and death. In cases without definitive signs of bowel necrosis, endovascular intervention is an alternative in treatment. Endovascular intervention may restore visceral perfusion quicker than standard laparotomy and open revascularization. Further studies are required to delineate the selection guidelines and operative techniques for patients who may benefit from endovascular approaches. In addition, prompt diagnosis is essential, suggestive of the benefit of protocols that begin on the initial patient encounter. **Conclusion:** Acute mesenteric ischemia is a rare, but life-threatening diagnosis associated with a high mortality. There are cases where endovascular therapy may be successful in restoring vascular flow and eliminating the morbidity of bowel ischemia and laparotomy.

C7 Title: Surgically Induced Alopecia Areata

Authors: Alexandra Bowles, BS (OMS-IV); Ben Witkoff, BA (OMS-IV)¹; Gabriela Maloney, DO²; Stephen D'Addario, MD²; Dawn Sammons, DO²

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Alopecia areata (AA) is a relatively common type of nonscarring hair loss that can occur in men and women equally at any age. Typically, it presents as sudden well-demarcated round patches of hair loss. While stress, diet and psychiatric conditions are reported to contribute to AA, AA is thought to be the result of autoimmune destruction of the hair follicle. We present a case of AA that we postulate is a result of local trauma and inflammation from a Mohs surgery on the scalp. A large area of AA occurred three weeks post-surgery and originated from the incision site. After allowing the surgical wound to heal for a total of five weeks, the patient was initiated on topical clobetasol solution and treated with 2.5 cc of 10mg/ml intralesional triamcinolone every 4-6 weeks for her AA. Mild hair growth was noted after 4 weeks of treatment. After 15 weeks (3 injections of intralesional triamcinolone), hair regrowth had returned close to baseline. Because surgically induced alopecia areata has not been studied in detail, our proposed pathogenesis behind surgically-induced alopecia is an immune attack of the surrounding hair follicles triggered by the inflammation and local trauma of surgery. As skin cancer rates increase and more Mohs surgeries and excisions are performed on the scalp, this unusual presentation of AA illustrates an unusual, but important, surgical complication that dermatologist and physicians involved with scalp procedures should be aware of.

C8 Title: An Uncommon Presentation of Low Back Pain

Authors: Jonathan Burgei, DO (PGY-1); Davis Mann, DO; Eric Leland, DO; Mansur Assaad, MD; Julia Lantry, MD; Elaine Kunzler, MD
Affiliation: Summa Health System, Akron, Ohio

Introduction: Back pain is a common symptom with a one-year prevalence of over 36%. Typically, it is a self-limiting condition, but certain presentations can suggest a serious underlying etiology. This case is one example of an uncommon presentation of back pain. **Case Description:** The patient is a healthy 29-year-old male who presented to the emergency department with low back pain and diarrhea. He was hyponatremic at 130 mEq/L. He was given IV fluids and then discharged. After two weeks of no symptom improvement he returned to the emergency department. His hemoglobin decreased from 15.7 g/dL to 11.6 g/dL, so a CT chest, abdomen and pelvis was ordered. The scan was positive for an acute pulmonary embolism, a left lower lobe pneumonia, and two right upper lobe pulmonary nodules measuring 0.4 and 0.3 cm. A Legionella urine antigen was positive. The next day the patient complained of chest discomfort, and an EKG showed diffuse ST-segment elevation suggesting acute pericarditis. Follow-up hypercoagulable panel was unremarkable. **Discussion:** The patient presented with back pain and was diagnosed with pulmonary embolism, pneumonia, and pericarditis. Viscerosomatic reflex for the heart and lungs are typically seen in the upper thoracic region. However, the viscerosomatic reflex for the lungs can extend down into the lower thoracic spine explaining the low back pain. **Conclusion:** Young adults who present with a complaint of back pain are typically seen as drug seeking. However, this case shows the importance of remaining objective and fully evaluating patients and considering all the clinical possibilities.

C9 Title: Pneumococcal Meningitis Complicated by Intracerebral Hemorrhage and Fatality: A Case Report and Literature Review

Authors: Serge Cardinali, DO (PGY-1); Rayan El-Zein, DO; Jasyyn Blankenship, DO

Affiliation: OhioHealth Doctors Hospital, Columbus, Ohio

Introduction: Bacterial meningitis is life threatening. Incidence is 4-6 cases per 100,000 adults and cerebrovascular complications remain rare. We hereby present a case of a female with pneumococcal meningitis complicated by intracerebral hemorrhage. **Case Description:** A 58 year old Vietnamese female with a history of bipolar disorder, schizophrenia, and tobacco abuse presents with a two day history of headache, fever, and altered mental status. She was admitted to the ICU for septic shock secondary to LLL pneumonia and suspected meningitis. Laboratory studies

revealed a lactic acidosis of 8.3 mmol/L with coagulation parameters indicative of DIC. Blood and CSF fluid cultures were positive for streptococcus pneumoniae. Empiric antibiotics were then targeted to ceftriaxone accompanied with dexamethasone. Her ICU course was complicated with the development of purpura fulminans with diffuse bullae formation. Her neurological status slowly improved from Day 3 – Day 9 but underwent a sudden deterioration on Day 10. MRI brain revealed a large left frontal cerebral hematoma. She was transferred to RMH. With evidence of significant herniation, no neurosurgical intervention was recommended. Subsequent brain perfusion study indicated brain death; the patient subsequently expired. **Discussion:** Despite antibiotics, mortality in meningitis remains high. The least common cerebrovascular complication is intracerebral hemorrhage occurring in 2-9% of patients. As in our patient, the proposed pathogenesis of intracerebral hemorrhage includes coagulation imbalances, endothelial damage, and vasculitis. **Conclusion:** Our case of pneumococcal meningitis complicated by intracerebral hemorrhage poses a complication that is yet fully delineated in the context of risk stratification, prevention, and treatment.

C10 Title: Postoperative Euglycemic Diabetic Ketoacidosis Secondary to SGLT-2 Inhibitor in the Bariatric Patient

Authors: Maureen Cheung, DO (PGY-5); Logan Mellert, DO; Walter Chlysta, MD, FACS, FASMBS

Affiliations: Western Reserve Hospital, Cuyahoga Falls, Ohio

Introduction: Sodium-glucose cotransporter 2 (SGLT2) inhibitors are a novel class of antihyperglycemic agents which inhibit glucose reuptake within the kidney. They can achieve immense reductions in serum glucose with minimal incidence of hypoglycemia. Since their introduction in 2013, reports of increased risk of diabetic ketoacidosis (DKA) and euglycemic diabetic ketoacidosis (euDKA) resulted in a 2015 FDA warning regarding the drugs association with DKA. euDKA is defined as DKA with plasma glucose levels <300mg/dL. **Case Description:** A 46 year old female presented POD #5 S/P Laparoscopic Roux-en-Y Gastric Bypass with a severe headache, generalized weakness, poor PO intake. Her initial surgery was uncomplicated and was discharged home on POD #2. She was found to have a high anion gap metabolic acidosis with ketosis. The remainder of her workup was negative. She was hemodynamically stable and responded well to medical management and resuscitation. After extensive investigation she was diagnosed with SGLT-2 Inhibitor induced euglycemic diabetic ketoacidosis in the postoperative period. She was discharged home on hospital day 4 in stable condition with cessation of offending medications. **Discussion:** SGLT2 Inhibitors have an increased association with DKA and euDKA. The posited mechanisms for SGLT2 inhibitor induced DKA include increased fat oxidation and ketone formation coupled with increased renal ketone reabsorption, and increased glucose transport into pancreatic alpha cells resulting in reduced insulin: glucagon ratio with volume reduction leading to decreased glucose oxidation and increased fat oxidation. **Conclusion:** In the post-bariatric surgical patient, these mechanisms are exacerbated by the low-carbohydrate, low-caloric state as well as physiologic responses to surgical stress.

C11 Title: Bacterial Endocarditis Presenting as Cortical Blindness

Authors: David de la Pena, DO (PGY-2); Benjamin Bale, DO; Gregory Volk, DO

Affiliation: Grandview Medical Center, Dayton, Ohio

Introduction: Since the start of the opioid epidemic, the number of complicated infection cases have steadily increased. Consequences of valvular vegetations include the feared septic-embolic phenomena. Embolization distribution is dependent on the valve involved. Among intravenous drug users, Serratia Marcescens has been reported, however remains rare. **Case Description:** We present a case wherein a 26-year-old male presented to the Emergency Department (ED) two days after an initial ED encounter with the chief complaint of blindness. During the initial visit, the patient unfortunately left against medical advice. He admitted to intravenous cocaine and heroin use and presented with stigmata of bacterial endocarditis. The patient was found to have a hypodensity in the right parieto-occipital region on CT scan. Echocardiogram demonstrated an aortic valve vegetation. Initial blood cultures grew gram negative bacilli, later identified as Serratia Marcescens resistant to piperacillin/tazobactam (Zosyn®). The patient ultimately was declared brain dead four days after admission. **Discussion:** We highlight a case of blindness secondary to aortic valve bacterial endocarditis with catastrophic consequences for this young patient. The patient's physical exam demonstrated stigmata classic for endocarditis. Bacterial agent of cause was resistant to initial choice of broad-spectrum antibiotic. Additionally, patient factors delayed initial treatment. Thus, the patient's response to therapy was suboptimal. **Conclusion:** In the face of the current opioid epidemic, bacterial endocarditis remains an increasingly common complication. Patient social factors and barriers to treatment can negatively impact the therapeutic course.

C12 Title: A case report of severe acute gastric distention with ischemia: review of literatures and the role of non-pharmacological approach in prevention

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Acute gastric distention (AGD) with ischemia in the elderly is rare and potentially fatal as initial symptoms can be vague. We reported a case of severe AGD with ischemia in an 88-year-old man with a prior history of colon resection, diabetes mellitus, and multiple gastric problems. Patient presented with abdominal pain, nausea, emesis and mid-back pain in an emergency department (ED) visit which computed tomography (CT) scan revealed severe gastric distention with air-fluid level and elevated lactic acid levels. Previous ED visit with similar problems occurred three weeks ago; he improved with supportive care. Diagnostics included CT angiography and repeated CT scan which showed persistent gastric distention with air-fluid level without evidence of compromised mesenteric circulation. The patient developed hematemesis complicated by rapid atrial fibrillation, leukocytosis and lactic acidosis. Esophagogastroduodenoscopy revealed diffuse severe gastritis and a gastric ulcer in addition to esophagitis. Patient was discharged to a long-term care facility after blood transfusion and referred for hospice care. Review of the case indicated that AGD was most likely due to severe gastroparesis with excessive gastric distention leading to ischemia and ulceration. Early recognition of the condition is essential for diagnosis and management which includes gastric decompression and surgery if indicated. Our case demonstrated a potentially fatal complication of a common gastric condition such as gastric distention/gastroparesis. In a non-acute setting, the role of non-pharmacological approach such as osteopathic manipulative therapy (OMT) and diaphragmatic breathing training, in the management of gastric distention is not well studied but potentially beneficial.

C13 Title: Spontaneous Isolated Superior Mesenteric Artery Dissection Associated With Cocaine Abuse: A Case Report

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Introduction: Spontaneous isolated superior mesenteric artery dissection (SISMAD) is a rare but potentially fatal disease. While cocaine's relationship with SISMAD remains unclear, we present a case of cocaine-related SISMAD in a patient with abdominal pain. **Case Description:** A

38-year-old African American male with a history of hypertension, alcohol, cocaine and tobacco abuse, and depression presented with acute-onset abdominal pain and recent cocaine use. Initial blood pressure was 190/120 mm Hg. His abdomen was soft with diffuse tenderness. A CT angiogram revealed SISMA within the proximal-to-mid SMA with thrombosis of proximal false lumen and no obvious re-entry point. He was successfully treated with conservative management. **Discussion:** Arterial wall dysfunction, shear stress, and cocaine-mediated arteriopathy play a role in the pathogenesis of SISMA. In aortic dissection, cocaine causes impairment of elasticity and apoptosis of vascular smooth muscle cells (VSMCs) which is also seen histologically in SISMA. Also, cocaine's increased sympathetic drive increases aortic shear stress particularly at the ligamentum arteriosum in addition to the SMA's transition from a retro-pancreatic position into a mobile position. Our patient's acute and chronic cocaine abuse likely resulted in gradual SMA wall dysfunction and elevated shear stress forming a nidus for subsequent dissection. CT angiography remains the gold standard for SISMA diagnosis. Using the Yun classification, a Type 2 SISMA, which our patient had, is more likely to undergo complete remodeling. **Conclusion:** Our report emphasizes the need to consider cocaine abuse in SISMA pathophysiology, risk stratification, and treatment algorithms in future studies.

C14 Title: Total Nail Evacuation as Sequelae of Stevens-Johnson Syndrome
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Stevens-Johnson syndrome/Toxic Epidermal Necrolysis (SJS/TEN) is a rare life-threatening, immunologically-mediated muco-cutaneous adverse reaction. It affects about 1-5/1,000,000 people yearly. Medications are a common trigger, and SJS/TEN initially begins as a flu-like illness that rapidly progresses to an extensive muco-cutaneous involvement that includes epidermal detachment. While there are many noted complications of SJS/TEN, including mucosal, ocular, and pulmonary involvement, onycholysis is a rarely reported repercussion. A 26 year old female presents to the Emergency Department(ED) due to fingernail shedding and pain. She was diagnosed and hospitalized with medication-induced Stevens-Johnson syndrome 4 months prior. On exam, patient had lost a majority of her toenails and fingernails. Nail dystrophy was present in several nails. This is one of the few reported cases of complete nail loss as a sequelae of Stevens-Johnson syndrome. This case report discusses her initial presentation, her short-term recovery period, and initiation of onycholysis. This case report aims to add to the body of knowledge on the long-term effects of SJS/TEN, specifically nail-related symptoms, and to encourage the further awareness of the comorbidities that patients in this group may present as sequelae. I conclude that while complete nail evacuation is a rare sequelae of Stevens-Johnson syndrome, immediate intervention may not always be requisite. However, more research is needed to best elucidate the likelihood of certain complications of SJS/TEN, including onycholysis, as this information can allow for effective planning of supportive and prophylactic measures to reduce both internal and external negative outcome.

C15 Title: Metastatic extra-mammary adenocarcinoma with rare ER positivity diagnosed from vulvar lesion resection: A case report
Authors: Alyssa Greenwell, MS (OMS-III)¹; Greg Manson, MD²
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Introduction: Incomplete regression of the mammary ridges can lead to the presence of ectopic mammary tissue, which is thought to be present in the vulva of two to six percent of women. This supernumerary mammary tissue has the potential to be malignant, with few cases reported. Given its' rarity, no routine treatment guidelines exist. **Case Description:** We describe the case of extra-mammary adenocarcinoma diagnosed in an otherwise previously healthy 66-year-old female from vulvar lesion resection. **Discussion:** The patient initially presented with worsening back pain and lower extremity radicular symptoms. Lytic lesions were discovered in the thoracolumbar spine, in addition to the liver and thalamus, and the patient was subsequently diagnosed with poorly differentiated metastatic adenocarcinoma of unknown primary origin. On further investigation, the patient was found to have a vulvar lesion with biopsy demonstrating the same adenocarcinoma. Suspicion for primary Bartholin Gland adenocarcinoma was raised. Patient underwent palliative radiotherapy to the spine and completed six cycles of Carboplatin/Taxol. Follow up with gynecologic-oncology resulted in resection of the vulvar lesion, upon which pathology revealed findings consistent with mammary line tissue with rare ER positivity. Arimidex was started followed by intermittent cycles of varying chemotherapy agents including Faslodex/Xeloda, Xeloda, and Doxil upon progression of metastatic lesions. **Conclusion:** Given the paucity of literature that exists regarding the treatment of metastatic extra-mammary adenocarcinoma in addition to the rarity of the disease process, it is important to consider the management strategies in any reported case. This can lead to improved outcomes for future patients.

C16 Title: Anomalous right coronary artery originating from the distal circumflex: A novel coronary artery anomaly viewed by invasive angiography
Authors: Mistafa Hafid, DO (PGY-1); Christopher Gibson, DO
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Introduction: Single left coronary artery with right coronary artery (RCA) originating from distal left circumflex artery (LCX) is a very rare anomaly with few cases reported. **Case Description:** A 61-year-old female with a history of right renal artery stenosis, hypertension, and recurrent pneumonia presented with a 1 day progressive course of worsening dyspnea. Electrocardiography demonstrated sinus tachycardia with possible prior inferior ischemia in leads II, III, and aVF. Transthoracic echocardiography demonstrated mild to moderate decreased systolic function with an ejection fraction of 40-45% with severe hypokinesis of mid-apical, mid- anteroseptal, mid-inferoseptal, and apical septal walls. Coronary angiography visualized a left dominant coronary circulation with an anomalous RCA from the distal circumflex with no right coronary ostium which showed no stenosis of the coronary vessels. **Discussion:** Lipton et al (1) established nine patterns of single coronary artery based on site of origin and anatomical circulation. The L-1 subtype arises when the RCA is absent and the LCX is dominant. The RCA coming from the distal circumflex is extremely rare. The majority of reported cases of RCA anomalies are from the proximal or middle portion of the LAD, whereas ours is the distal portion. Such an anomaly is not expected to have any severe complications or should cause ischemia. **Conclusion:** The patient underwent no cardiac intervention and was discharged home with instructions to have a CT Angiogram to establish a complete course of the RCA. The patient is doing well after 3 months. This present case demonstrates a unique case involving the right coronary artery.

C17 Title: Atypical Elevation of Alpha-Fetoprotein in Histologically Pure Seminoma
Authors: Jared Harp, BS (OMS-III)
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Introduction: Pure testicular Seminomas classically do not produce serum elevations in Alpha-Fetoprotein (AFP). Significant elevations in AFP alter the treatment of testicular Seminoma, and management of mild elevation is less clear. **Case Description:** A 37 year old male with multiple

congenital deformities, including: scoliosis, solitary kidney, imperforate anus with colostomy and subsequent reversal, and an undescended testicle which was removed surgically in adolescence, presents with two month history of a mass in his remaining testicle. This patient underwent radical orchiectomy, and the mass was histologically confirmed by three separate institutions to be pure Seminoma. Laboratory evaluations post operatively revealed persistently elevated AFP in the range of 15.2-19.5 ng/mL (0.0-15.0 ng/mL). There was no evidence of liver disease or metastatic spread on CT Abdomen/Pelvis. Patient was staged T2N0M0. **Discussion:** Elevations in AFP in Seminoma can be suggestive of a non-Seminomatous component of the testicular cancer, or of liver metastasis. There is also a risk of elevated AFP in patients endorsing Cannabis use, which this patient denies. Current NCCN Testicular Cancer guidelines, version 1.2019, recommend Seminoma patients with elevated AFP be treated as non-Seminoma patients. The NCCN recommends, however, that decisions should not be based on AFP <20 ng/mL. The implications of mild AFP elevations in pure Seminoma are unclear. **Conclusion:** Given significant differences in treatment approaches to Seminoma with and without elevated AFP, more research needs to be performed to determine the clinical significance of mild serum AFP elevation in histologically pure Seminoma.

C18 Title: The Bleeding Gastric Nipple: A Case Of Dieulafoy's Lesion

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Dieulafoy's lesion is a persistently dilated submucosal vessel that ravages the epithelium without any inciting visible ulcer. Although relatively uncommon, Dieulafoy's lesion is an important cause of acute upper gastrointestinal bleeding in adults. The submucosal artery deviates from normal branching of arteries in the stomach increasing the caliber of mucosal capillaries by 10 times. Dieulafoy's lesion can appear as a raised nipple or visible vessel on endoscopy. About 75% lesions occur in the stomach usually within a few centimeters from the gastrointestinal-esophageal junction along the lesser curvature. A 56-year-old Caucasian female with past medical and surgical history of anemia, dyslipidemia, GERD, depression, hip replacement, c-section and right breast biopsy presented with two hours of hematemesis and intermittent abdominal pain associated with nausea. Patient was feeling ill for two weeks but progressively felt worse on evening of presentation to the ER, had two episodes of large projectile vomiting with bright red clots in it. An EGD was performed which revealed a small raised spot in the gastric body that bled profusely on irrigation. The lesion was injected with 1:10,000 units of epinephrine. The lesion continued to ooze after 30 joules of heater probe was applied. The lesion was subsequently clipped with good hemostasis. Dieulafoy's lesion can be difficult to diagnose and can cause potentially life-threatening and recurrent upper gastrointestinal bleeding if undetected. It should be considered as a differential in patients who present with upper gastrointestinal bleeding of unclear origin as it is amenable to life-saving endoscopic therapy.

C19 Title: A Rare Case of Primary Anorectal Malignant Melanoma

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Introduction: Primary rectal melanoma is an extremely rare and aggressive malignancy. Due to the rarity of this malignancy, there is limited data available in regard to this disease process. A clear etiology has not been established and optimal treatment has yet to be determined.

Case Description: This report describes the case of a 53-year-old male who presented to the emergency department with a 6-week history of multiple healthcare visits due to recurring diarrheal episodes and progressive left sided sciatica type pain. An initial Contrast CT of the abdomen and pelvis revealed a large rectal mass and perirectal lymphadenopathy. Extensive workup resulted in an ultimate diagnosis of primary rectal melanoma with metastasis to the liver and lung. Patient experienced many complications despite undergoing optimal palliative treatment.

Discussion: Malignant mucosal melanoma arising from the anorectum is extremely rare. Mucosal melanoma accounts for less than 1% of all melanomas, which more commonly originate in the skin or retina. Furthermore, anorectal malignancies are frequently adenocarcinoma or squamous cell carcinoma in nature with the incidence of anorectal melanoma less than 0.05%. After diagnosis of this rare and often incurable disease is established a patient centered teamwork approach should be utilized to obtain best patient quality of life. **Conclusion:** Differential diagnosis should include metastatic anorectal melanoma in patients who present with recurrent and progressive gastrointestinal symptoms. Diagnosis should be confirmed with histopathology and followed with a thorough metastasis evaluation. Further study is warranted to more clearly define the etiology and optimal treatment for this malignancy.

C20 Title: Sigmoid Volvulus in an Institutionalized Patient (a case presentation)

Authors: Jacob Lane, BS (OMS-III)

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Introduction: Sigmoid volvulus (SV) is a rare cause of intestinal obstruction in the United States representing fewer than 10% of cases. The mean age of occurrence is 70. Risk factors include institutionalized patients with underlying psychiatric or neurologic disorders causing chronic constipation. SV can be associated with certain colonic dysmotility syndromes, including acute colonic pseudo-obstruction (known as Ogilvie syndrome). Colonic volvulus occurs due to an axial twisting of the colon on its vascular pedicle. **Case Presentation:** A 25-year-old Caucasian male with severe autism presented to the emergency department with dyspnea and abdominal distention progressively worsening over the previous 4-6 hours. He was non-communicative, residing in a nursing facility and an accurate history was unable to be obtained. Vital signs included: pulse 155 beats/minute; respirations 40 breaths/minute and blood pressure 122/87 mmHg. Physical exam significant for obviously distended tympanic abdomen with high-pitched bowel sounds. Chest X-ray revealed severely distended loops of bowel and abdominal computed tomography revealed a SV, demonstrating the classic swirls and coffee bean sign. Intravenous (IV) fluids were initiated along with IV vancomycin and piperacillin-tazobactam. Emergent flexible sigmoidoscopy and sigmoid colectomy with end colostomy and Hartmann pouch were performed. **Discussion:** The fact that a young patient presented with a SV makes this case unique. Several risk factors for SV were present, including being institutionalized and having Ogilvie Syndrome. The co-morbid psychiatric illness requiring pharmacological treatment predisposed to chronic constipation leading to a heavy bowel regime. **Conclusion:** Although rare, prompt medical diagnosis and treatment are needed for optimal sigmoid volvulus outcomes.

C21 Title: Retroperitoneal Malignant Peripheral Nerve Sheath Tumor Incidentally Discovered during Anemia Work up

Authors: Aimee LaRiccia, DO (PGY-2); Donald Hura, MD; Brad Sherman, DO

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Introduction: Retroperitoneal Malignant Peripheral Nerve Sheath tumors (MPNST) are a rare subtype of soft tissue sarcomas. These tumors most commonly present in the extremities or head and neck region. This case report details how this incidentally found tumor was treated.

Case Description: This case report describes a 76 year old male who presented to the hospital with anemia causing life altering fatigue. During the work-up a CT was obtained which showed a retroperitoneal mass. The mass was biopsied and consistent with a retroperitoneal MPNST. An

exploratory laparotomy was performed and the tumor was completely excised with grossly negative margins. **Discussion:** MPNSTs are a type of soft tissue sarcoma. Although a biopsy is not always necessary according to the guidelines, this mass was biopsied due to the unique nature of presentation. Soft tissue sarcomas are generally more common in the extremities. Intraperitoneal and retroperitoneal sarcomas are increasingly rare. This patient did not have any abdominal related complaints which can be seen with abdominal sarcomas such as melena or obstruction. Using current guidelines the post-operative course for treatment of a retroperitoneal soft tissue sarcoma include physical exams with imaging at 3-6 month intervals for 2 years, every 6 months for 1 year and then yearly. **Conclusion:** Retroperitoneal MPNSTs are both rare in occurrence and the treatment strategies are not well described in the literature. Tumor free margin resection is the mainstay of treatment currently to prolong overall survival.

C22 Title: Atypical Hemolytic Uremic Syndrome from Head to Toe- A Difficult Diagnosis

Authors: Jordan Luli, DO (PGY-1); Jeffery Sobecki, DO; Jonathon Eberle, DO

Affiliation: OhioHealth Doctors Hospital, Columbus, Ohio

Introduction: Atypical hemolytic uremia syndrome (aHUS) is a rare disease, occurring in less than 10% of all hemolytic anemias, encompassing thrombocytopenia, microangiopathic hemolytic anemia, and acute renal failure. aHUS usually progresses to end-stage renal disease, requiring hemodialysis. **Case Presentation:** A 21 year old female with a past medical history of malignant hypertension, marijuana abuse, and medical noncompliance presented to the hospital with a chief complaint of headache, nausea, vomiting, generalized body aches for one week. In the ED she is found to be bicytopenic and admitted to the ICU for acute renal failure. There were concerns for aHUS and patient was started on plasmapheresis and eculizumab therapy after genetic testing was sent out and renal biopsy was consistent for a chronic active thrombotic microangiopathy. After a month long stay she was discharged from the hospital with hemodialysis and eculizumab therapy and referred to an aHUS specialist at a tertiary care center. **Discussion:** Genetic testing and renal biopsy are the gold standard for aHUS diagnosis. Our patient's genetic testing came back negative which can happen in 30% of all patients with aHUS. Beginning eculizumab therapy early in disease course is vital in decreasing inflammation and endothelial damage, which in turn helps heal the kidneys, and other end organ damage. **Conclusion:** Even if genetic testing comes back negative, it is important to look at biopsies and response to therapy to aid with diagnosis of aHUS. It is vital to begin therapy early in these patients to help decrease inflammation and end-organ damage.

C23 Title: The Rare Complication of Radial Artery Access in Left Heart Catheterization

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Introduction: Gaining access to perform left heart catheterization (LHC) was most commonly performed through the common femoral artery for the past several decades, but over the past couple of years, research has shown the radial artery approach to be much safer than the femoral artery and so it has become the most common approach today. Radial artery approach reduces major complications and improves patient comfort but some complications still occur such as hematoma and pseudoaneurysm. **Case Presentation:** We present a case of an 86 year-old gentleman who comes to the emergency department (ED) with chest pain. He was found to have an inferior myocardial infarction and taken emergently to the catheterization lab. A left radial artery approach was utilized without immediate complications and PCI was not performed. Hemostasis was obtained with a radial band post angiography. He was discharged on day two without evidence of hematoma. He presented back to the ED seven hours later with throbbing wrist pain. Ultrasound was performed and showed a 33x21cm left radial artery pseudoaneurysm (LRAP) and vascular surgery was consulted who repaired the pseudoaneurysm. **Discussion:** LRAP is a rare complication of LHC, which only occurs in <0.1% of all LHC complications. Due to rarity of this complication, there are no standards of care. Case review of management includes surgery, compression, and thrombin injection. **Conclusion:** LRAP is a very rare complication. As left radial approach becomes more common for LHC, more cases of LRAP increase and guidelines for management will be established.

C24 Title: Human Papillomavirus Strains in Southeast Ohio

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Introduction: Southeast Ohio has some of the highest rates of HPV-associated cancer rates in the country. HPV data gathered from a community hospital in Southeastern Ohio reveals that the most prevalent HPV strains are not 16 and 18. Most patients fall within an "other-strain" category. This poses an issue regarding the vast population of twenty and thirty year-olds who have received the Quadrivalent Gardasil vaccine. **Case Description:** S.P. is a 22-year-old female who presented to the office after an abnormal colposcopy, which showed moderate to severe dysplasia with glandular involvement. This patient was up to date on all of her Gardasil shots and does not meet most of the risk factors for developing a persistent HPV infection, but tested positive for HPV. **Discussion:** The data shows that the Quadrivalent Gardasil vaccine does not cover the HPV strains that are most prevalent in our area. This patient's case brings up a very important question about the HPV vaccination history of the majority of adults living in Southeastern Ohio and potentially the country. Do we have adequate vaccination protection for HPV? **Conclusion:** The high prevalence of HPV-associated cancer in Southeast Ohio has many variables including access to care, relationship with low percentage of teenage girls who finish their HPV vaccination, and high prevalence of atypical HPV strains. This information is very important to share with our community so that they are aware of the oncogenic risk of this virus and the peculiar virus profile in this area.

C25 Title: Spontaneous Atraumatic Splenic Rupture in Systemic Infiltrative AL Amyloidosis

Author: Scott McLemore, BS (OMS-IV)

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Introduction: An atraumatic spontaneous splenic rupture (SSR) in systemic amyloidosis is a rare condition and is associated with a high (26%) 30-day mortality. A high clinical suspicion is required to initiate prompt treatment with either splenectomy or angioembolization. **Case Description:** A 50-year-old female with known systemic AL Amyloidosis causing cardiomyopathy, and end-stage renal disease presented with sudden diffuse abdominal pain, positional chest pain, and hypotension. She denied recent trauma. Laboratory evaluation demonstrated a decreased hematocrit. Abdominal examination was negative for peritoneal signs. A non-contrast CT Chest, Abdomen, Pelvis demonstrated a sub-capsular hematoma involving the spleen and extension of this hemorrhage within the abdomen. A CTA the following day showed interval increase in high attenuation free fluid, consistent with intraperitoneal bleeding. The patient was deemed a poor surgical candidate for splenectomy given her co-morbidities. She successfully underwent a distal splenic artery embolization with interventional radiology. The patient was stabilized and ultimately discharged without the need for subsequent red blood cell transfusion. **Discussion:** SSR is a known complication of AL Amyloid and has several proposed mechanisms; including direct amyloid damage, amyloid angiopathy, and complexed factor X deficiency predisposing patient to bleeding. Splenic artery embolization has been shown to achieve hemostasis and spare patients from

splenectomy. **Conclusion:** SSR in AL amyloidosis is a carries a high mortality rate. A high clinical suspicion and prompt treatment with either splenectomy or splenic artery embolization is necessary to avoid complications and reduce mortality.

C26 Title: Hypothyroidism Presenting as Hypertension in a Pediatric Patient; a Rare Phenomenon
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Introduction: As defined by the AAP guidelines issued in 2017, prevalence of hypertension in the pediatric population is approximately 2.3%. The percentage is higher in shorter males less than 13 years of age, and in taller males 13 years of age and older. Below the age of 6, secondary hypertension due to a renal abnormality is the most common cause. In children 6 years and older, essential hypertension is the most common etiology. Causes of pediatric secondary hypertension that are currently recognized include renal disease, endocrine disease, neurological causes, psychological causes, and pharmacologic causes. Acknowledged endocrine issues include hyperthyroidism, congenital adrenal hyperplasia, Cushing syndrome, primary aldosteronism, primary hyperparathyroidism, diabetes mellitus, hypercalcemia, and pheochromocytoma. **Case Description:** Here we report the case of a 14-year-old Caucasian female presenting with hypertension discovered on a routine screening. The patient was found to be hypothyroid and subsequently treated with hormone replacement, which resulted in resolution of hypertension. **Discussion:** While the association of hypertension with hypothyroidism has been recognized in the adult population, this is a rare presentation in childhood. On review of the literature, few cases of this nature were discovered. Pediatricians should be aware of this phenomenon when encountering a child with elevated blood pressure, as untreated hypothyroidism can have effects on multiple systems. **Conclusion:** In conclusion, hypothyroidism in children uncommonly presents with hypertension. Physicians should be aware of this potential occurrence when treating pediatric patients with high blood pressure.

C27 Title: Radial scar: a case report
Authors: Marina Metzler, BA (OMS-III)
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Introduction: Radial scar of the breast is a central fibroblastic core with entrapped ducts. On mammography radial scars appear as a central radiolucency with radiating spicules and architectural disturbances, which mimic carcinoma. The pathogenesis of radial scars is unknown. **Case Description:** A 78-year-old female was referred to the general surgery clinic after a screening mammogram showed a new nodular density. The lesion was not appreciated by ultrasound and was classified BI-RADS category 4. History and physical exam were not significant. Stereotactic vacuum assisted biopsy revealed fibrocystic change with florid ductal hyperplasia, macrocalcification, and features of radial scar. Wide local excision revealed radial scar with fibrocystic change. **Discussion:** Radial scars are considered an incidental finding, precursor to carcinoma, or a marker of risk for carcinoma. Variable rates of post biopsy upgrade to atypia or carcinoma have been reported. Conservative management may be recommended for radial scars without atypia. However, excision may be warranted if size ≥ 1 cm, pathological and radiographic discordance, or presence of atypia or other high-risk lesions. **Conclusion:** Radial scars are benign lesions. Excisional biopsy may be warranted after core biopsy due to associations with carcinoma.

C28 Title: A rare location of radial nerve compression
Authors: Trent Milligan, DO (PGY-4); Tallat Risk, MD
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Introduction: The radial nerve has several sites where it can be compressed along its course from its origination at the posterior cord until it terminates as the posterior interosseous nerve. Our patient had a rare compression at the lateral intermuscular septum. **Case Description:** This is a 51-year-old male who was involved in a motor vehicle accident in 2008 and continues to have left humerus pain after open reduction and internal fixation of the humerus. He was seen by Physical Medicine and Rehabilitation to establish care after moving to the area. On exam he had localized tenderness to the lateral epicondyle on the anterolateral aspect of his left arm without weakness. The patient was worried that his humeral hardware was the cause of his pain. **Discussion:** An EMG performed was consistent with chronic left radial nerve neuropathy higher than the spiral groove. CT showed a healed humerus fracture with hardware in alignment. The patient had one week relief of symptoms after a lidocaine injection at the maximal site of tenderness. Orthopedics was consulted and the patient elected to undergo radial nerve decompression. The radial nerve was found to be compressed proximally as it pierced the lateral intermuscular septum and not by the hardware. 10 days later at follow up the patient reported complete resolution of his arm pain. **Conclusion:** EMG and localized injections can help locate the site of a radial nerve compression and help guide the site of surgical decompression.

C29 Title: Fahr's Disease: A rare cause of Parkinsonism
Authors: Trent Milligan, DO (PGY-4); Steven Farrell
Affiliations: University of Toledo Medical Center, Toledo, Ohio

Introduction: Fahr's disease is a rare progressive neurological disorder with both spontaneous and familial causes. It is characterized by abnormal calcified deposits in the basal ganglia and cerebral cortex. Clinical presentation ranges from deficits in memory and extrapyramidal symptoms to movement disorders including Parkinsonism. **Case Description:** The patient is a 63 year old black female who was admitted to the rehab hospital in 2016 due to progressive decline in her ability to ambulate and perform ADLs as well as developing dementia, dysphagia and sialorrhea. A MRI of the brain showed bilateral calcifications in the basal ganglia consistent with Fahr's disease. Family history elicited during the acute rehab revealed that the patient's sister and brother suffered from cognition and gait difficulties to varying degrees. Her father and paternal uncle had been diagnosed with Parkinson's. **Discussion:** A trial of carbidopa/ levodopa during the patient's rehabilitation unfortunately failed to improve the gait. Symptomatic control of sialorrhea was achieved with a scopolamine patch. Speech therapy worked with the patient to develop safer swallowing as well as trialing a communication device for her progressive dysarthria. She remained unsafe to ambulate without direct supervision and was discharged to a skilled nursing facility. **Conclusion:** Familial cases of Fahr's disease are rare and although there isn't definitive treatment, acute rehabilitation has a role in maximizing quality of life and independence. Further it allows an opportunity to educate family members about the risks for future generations and the need to establish with a movements disorders specialist.

- C30 Title:** Anterior Capsular Reconstruction using a Dermal Allograft for an Irreparable Subscapularis Tear after Shoulder Arthroplasty
Authors: Devon Myers, DO (PGY-1)¹; Jacob Triplet, DO¹; David Johnson, DO¹; Jeffery Strakowski, MD²; Stephen Wiseman, DO³; Nathaniel Long, DO³
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Introduction: Total shoulder arthroplasty (TSA) is common, but it is not free from complication. Rates of subscapularis (SSc) tear can approach 50% post-operatively. This said, the SSc helps provide stability and function to the glenohumeral joint. Existing surgical options for SSc repair mostly center on adjacent muscle transfers and have had mixed results. Further, transfers have shown an even higher rate of failure post-arthroplasty. Recently, dermal allografts have been used successfully for superior capsular reconstruction after irreparable supraspinatus tears. It is sensible that this technique may be used similarly for anterior capsular reconstruction (ACR) of the shoulder. **Case Description:** A 51-year-old male was noted to have an irreparable subscapularis tear after TSA. Due to positive reported results with superior capsular reconstruction and poor results with tendon transfer after TSA, his insufficiency was addressed with ACR using a dermal allograft. Two-year follow up results demonstrate good functional outcomes, no recurrent instability, and excellent patient satisfaction. **Discussion:** While early results using dermal allograft for superior capsular reconstruction have been positive, its outcomes in ACR are largely unknown. This technique represents a novel strategy for treating SSc insufficiency after TSA, where traditional procedures have lacked success. It also represents lower surgical risk and may delay the need for revision to reverse total shoulder arthroplasty. **Conclusion:** Anterior shoulder insufficiency after TSA can significantly alter glenohumeral function and is an important cause of patient morbidity. This novel technique exhibits a good outcome and provides orthopedic surgeons with an alternative to previous methods of repair.

- C31 Title:** Progressive and Severe Proliferative Diabetic Retinopathy
Authors: Thu Nguyen, PharmD (OMS-II); Robert Morris, RN; Harold Leeper, MD, PhD
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Introduction: Proliferative diabetic retinopathy (PDR) is progressive leading to blindness. PDR develops in 20% of patients with diabetes mellitus (DM) with equal occurrence in type I and type II DM. This case report describes a patient who presented with deteriorating, severe PDR in both eyes. **Case Description:** A 44-year-old male presented with a two-week of blurred vision in the right eye. History significant for insulin dependent diabetes mellitus. Examination revealed retinal hemorrhages, exudates and microaneurysms in both eyes. There are macular edema, neovascularizations, fibrous and vitreo-retinal traction for each eye. Color photographs demonstrate proliferative diabetic retinopathy with associated clinically significant macular edema, schemia and neovascularization for both eyes. There is vitreo-retinal traction for each eye. Treatment included scatter photocoagulation, focal laser therapy and Avastin injections. **Discussion:** Patient diagnosed with PDR and leakage apparent in the mid to late stages of the angiogram consistent with the degree of macular edema noted clinically in both eyes. Furthermore, ischemia and neovascularization are apparent in both eyes. Severe PDR increases the risk for blindness for which early recognition is crucial. The patient had significant macular edema and neovascularizations. Patient is at an increased risk for a traction retinal detachment due to vitreo-retinal traction. Focal laser treatment, scatter photocoagulation and a series of Avastin injections reduces macular edema and decreases neovascularization, and reduces the vascular component of fibrosis. **Conclusion:** Early diagnosis of PDR is vital to reducing blindness. Focal laser treatment, scatter photocoagulation and Avastin injections reduce macular edema and neovascularizations resulting in improved prognosis.

- C32 Title:** Ecthyma Gangrenosum and the Curious Case of Drop in Hemoglobin
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Introduction: Ecthyma gangrenosum (EG) is a rare life-threatening requiring prompt antibiotic therapy. EG develops in 1.3-13% patients with Pseudomonas aeruginosa sepsis. Even more, drug-induced hemolytic anemia uncommonly occurs in 1 in 1 million of the population. This case report describes a patient who presented with EG followed by hemolytic anemia during antibiotic treatment. **Case Description:** A 52-year-old female presented with a one-week left tibial ulcer. EG diagnosed by round erythematous ulcer with hemorrhagic focus. Admitted on sepsis criteria and was started on IV piperacillin-tazobactam, vancomycin, and fluid hydration. Wound culture showed P. aeruginosa, soft tissue edema on LLE radiograph, negative blood culture and no osteomyelitis. Hemoglobin dropped on days 3, 4, 5, 6 and 7. Transfused 1UPRBC. Workup revealed no GI bleed, LDH in 1000s and positive direct Coombs. Piperacillin-tazobactam discontinued, ciprofloxacin was started then switched to meropenem due to rash. Hemoglobin improved, patient discharged and followed-up in outpatient. **Discussion:** EG is diagnosed by round erythematous ulcer with hemorrhagic focus and can progress to gangrene and sepsis. Risks include DM, burns, immunosuppression. Pseudomonas degrades tissue in perivascular space leading to ischemic necrosis. Consider drug-induced hemolytic anemia after rule-out common causes. Hemoglobin improves after halting drug. **Conclusion:** Diagnosing and treating EG early is paramount as well as recognizing drug-induced hemolytic anemia. After discontinuing offending drug, patient outcome improves.

- C33 Title:** Windssock Diverticulum
Authors: Erin O'Neill, DO (PGY-II)
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A windssock diverticulum, or an intraluminal diverticulum, is a congenital abnormality described as a saccular structure connected to the wall of the duodenum. They can be connected to the entire or part of the wall of the duodenum. They are caused by incomplete recanalization during fetal development. They typically arise from the second portion of the duodenum and can extend as far distally as the fourth part of the duodenum. Many are asymptomatic, however, when symptomatic they can present at any age and present with nausea, vomiting and abdominal pain. Windssock diverticula are extremely rare with less than 100 cases every reported.

- C34 Title:** Identification of Necrotizing Fasciitis
Authors: Rini Patadi, BS (OMS-III)
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Introduction: Necrotizing fasciitis is a rare type of skin infection, which if not identified, can lead to severe consequences. It is a deep infection that causes destruction of the fascial plane and overlying subcutaneous tissue. Necrotizing Fasciitis can mimic other skin complaints, which is why clinicians can miss this diagnosis. **Case Description:** A 57-year-old diabetic female presents with a chief complaint of an excruciating erythematous sore on her abdomen. This sore presented itself 4 days ago. It is accompanied with burning pain, fever and chills. The patient is currently taking Adalimumab for psoriatic arthritis. On physical exam, the erythematous sore was draining a purulent material. The patient was

sent to surgery due to high clinical suspicion and the fascia showed necrotizing fasciitis. The necrotic tissue was debrided, the patient was started on antibiotics, and made a full recovery. **Discussion:** It is important to recognize necrotizing fasciitis because delaying treatment can lead to limb loss and death. Patients are typically diabetics or those on immunosuppressant medications. They present with erythema, pain out of proportion, fever, and crepitus. Diagnosis can only be made in the operating room but imaging can show gas in soft tissues. Treatment involves surgical debridement and antibiotics.

Conclusion: Since necrotizing fasciitis can quickly lead to mortality, it is important to recognize signs and symptoms. If one is to suspect this condition, emergent treatment is indicated. In a patient with an erythematous skin complaint and severe pain, necrotizing fasciitis should be on the differential list.

C35 Title: Differentiation of Ovarian Cyst and Ectopic Pregnancy

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Introduction: Ruptured Ovarian Cysts are seen most commonly in women of reproductive age. They arise from rupture of follicles, endometriosis, or malignant tissue. It is important to identify the rupture of an ovarian cyst in pregnancy, as it can mimic an ectopic pregnancy rupture. **Case Description:** A 28-year-old Gravida 1 Para 0 in her 1st Trimester presented with severe Right Lower Quadrant pain. The patient described it as a stabbing pain. She had anxiety and nausea, but no vaginal bleeding. Physical Exam was unremarkable other than tenderness on palpation of the right lower quadrant. At the visit her urine b-HCG was positive. Considering she was early in her pregnancy, Ectopic Pregnancy needed to be ruled out. She was sent for a Tran-Vaginal Ultrasound, which showed fetal tissue present in the uterus indicative of normal pregnancy. However, a small cyst with fluid was observed near the right ovary. **Discussion:** When cyst rupture occurs blood/fluid is released into the peritoneum and pain is felt. Once confirmed, majority of ruptured cysts can be treated conservatively. This is especially true with pregnancy. Signs of hemodynamic instability and infection need to be monitored as this can change medical management. Treatment for Ectopic Pregnancy differs from ruptured cyst. There are different options for treatment depending on the extent of the ectopic. **Conclusion:** Since ectopic pregnancy can present similarly it is important to take ruptured cysts seriously. Management depends on diagnosis. In a pregnant patient with unilateral abdominal pain, ovarian cysts and ectopic pregnancy should be considered.

C36 Title: Awareness for pelvic congestion syndrome - a commonly underdiagnosed vascular condition in women of reproductive age

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Chronic pelvic pain (CPP) is defined as non-cyclical pelvic pain lasting longer than six months that affects 30% of gynecological patients. One of its etiologies, pelvic congestion syndrome (PCS), accounts for 16% to 31% of all the cases of CPP. A 51-year old female patient was consulted for complaints of heaviness and aching in the lower extremities along with right sided pelvic pain exacerbated by prolonged sitting, menstruation, and sexual intercourse. Her symptoms failed to improve with conservative management. The venous duplex US of lower extremities and CTA of the iliac veins found a right ovarian vein measuring 10x8 mm in diameter. The follow-up venous angiogram showed significant right ovarian vein dilation with varicosities indicating coil embolization. The coil embolization was started with a 60cm x 8mm of Ruby coil, Penumbra. The initial coil was followed by three additional 60 cm packing coils, two 45 cm packing coils, and two coils, 8x60 and 6x30, in the mid portion of the ovarian vein. The final angiogram showed successful closure of the right ovarian vein without any complications. The patient reported absolutely no pelvic pain after the procedure and was relieved of her initial clinical symptoms. Cases like this prove that venous coil embolization is safe and effective in treating CPP with success rates of 96% -99% with fewer complications and shorter hospital stays. Such cases continue to raise awareness and support for vascular intervention to relieve chronic pelvic pain in afflicted women of reproductive age in the United States.

C37 Title: Opioid Free Partial Colectomy

Authors: Paul Stephen, DO (PGY-2)

Affiliation: Grandview Medical Center, Dayton, Ohio

This is a case report of the patient who presented with malignancy in her ascending colon. ERAS protocol was followed in the preoperative, intraoperative and postoperative period. The patient underwent hand-assisted laparoscopic right hemicolectomy with primary anastomosis. The following morning, the patient was relatively pain-free using multimodal pain management, rating pain 2/10. Her diet was advanced as tolerated. She was ambulating without difficulty. Additionally, the patient had return of bowel function on the morning of postop day #1. Having no reason to keep the patient for further observation, she was discharged home on postop day #1. She has been seen for follow-up appointments and continues to do well. The patient received no opioids through the entirety of her pre-operative, intraoperative or postoperative care. In our facility, it is common for patients to stay in the hospital after bowel resection for 5-7 days awaiting return of normal bowel function as well as pain control. This case report demonstrates that following ERAS protocol we may be able to significantly reduce the patient's postoperative length of stay. Additionally, this case report demonstrates that it is possible to perform a major abdominal surgery without the use of opioid medication.

C38 Title: Delaying the Onset of Huntington's Disease with Diet and Exercise

Authors: Michael Popson, BS (OMS-III)

Affiliation: Kentucky College of Osteopathic Medicine, Pikeville, Kentucky

Introduction: Huntington's Disease is a rare, poorly understood neurological disorder resulting in motor dysfunction, psychiatric changes, and eventually death. The severity and onset of the disease is dependent on the number of CAG repeats present on the Huntingtin gene. There is no treatment for Huntington's Disease, and due to the disease's limited prevalence and insidious nature, performing clinical research is a challenge. **Case Description:** A 45-year-old man consulted his doctor because his mother was diagnosed with Huntington's Disease, and he wanted to be tested. He tested positive with 41 CAG repeats, the same number of as his mom, and therefore was predicted to have a similar disease progression. The man's symptom onset, however, was later than his mom's. His mother began having symptoms when she was 54 and became dependent, living in a nursing home, when she was 66. She passed away when she was 73. The son's symptoms began at age 64, and he remains independent, currently living by himself at 70 years old. **Discussion:** The postponement of symptoms is hypothesized to be correlated to the lifestyle changes, heavy aerobic exercise and Mediterranean/seafood diet, the son made after his test results. Current research is consistent with this hypothesis. However, this research is limited by the disease's small prevalence. **Conclusion:** There is no cure for

Huntington's Disease, but delaying the onset of symptoms brings us one step closer. This case reinforces the potential of diet and exercise to delay the progression of this debilitating condition.

C39 Title: The Effects of OMT on Progressive Massive Fibrosis: A case study of an adjunctive therapy to improve respiratory function in Appalachian Coal Miners

Authors: Joshua Raven, BS (OMS-III); Paige Lewis, BS (OMS-II); Antoinette Justice, DO; James Crum, DO

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Introduction: Recently in Central Appalachia, there has been a resurgence of the more complicated form of Black Lung Disease known as Progressive Massive Fibrosis (PMF). Patients with PMF suffer from severe restrictive lung disease effecting their quality of life. This case study was aimed at determining the effects Osteopathic Manipulative Treatment could have to improve the lives of these individuals.

Case Description: This case involved a 56-year-old male who is now a retired coal miner after working 32.5 years underground. The patient was diagnosed with coal worker's pneumoconiosis in 2015. Over the span of a year the patient was seen twice a month. During this time, he was treated using multiple treatment types including muscle energy, cranial, and other techniques. Quality of Life was evaluated on a monthly basis using the RAND 36 Item Survey (SF-36). Spirometry was evaluated at every visit in accordance with Center for Disease Control (CDC) protocols as well as other quantitative measurements. **Discussion:** Though the patient's quality of life seemed to improve over time, the data was not statistically significant. He reported improvement in his activities of daily living compared to previous. There was no significant improvement in his spirometry values, but the patient did report feeling less short of air compared to the start of the study. **Conclusion:** This case illustrates that OMT has the potential to provide adjunctive treatment for patients with PMF. Limitations due to sample size as well as socioeconomic deficits of former Appalachian coal miners warrants further study.

C40 Title: New Daily Persistent Headache (NDPH) post Epstein-Barr Virus (EBV) Infection

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Introduction: New Daily Persistent Headache (NDPH), a subtype of chronic daily headaches, is rare compared to other primary headache disorders. It has an abrupt onset and tends to be unremitting. There are unidentified triggers in the majority of people, but triggers such as flu-like illnesses and stressful life events in others. **Case Description:** We present a case of a 21-year-old Caucasian male who presented to the neurologist with complaints of throbbing, "Ice-pick like" headaches. He recalled the exact day the headache began. His past medical history is significant for a previous Epstein - Barr virus (EBV) infection. Neuroimaging ruled out secondary causes for the headache, which resulted in his diagnosis of NDPH. Initial management included non- pharmacologic treatment such as exercise, healthy diet, and proper sleep hygiene. The patient deferred medication options such as Topamax and Lamictal due to potential side effects. **Discussion:** NDPH is an uncommon, underdiagnosed condition predominantly in females and adolescents. Infectious etiology, especially EBV, is a trigger for NDPH in a significant portion of people. Antibody titers can demonstrate the presence of past or current infection to help determine if a viral illness is the triggering event for the headache. **Conclusion:** It is important to explore how the effects of a virus, after an infection as resolved, can alter the brain in such a way that triggers this headache. Future studies should investigate reasons the headache remains unremitting despite treatment of the underlying event. The understanding of this can potentially guide future treatment options with minimal side effects, specifically targeting NDPH.

C41 Title: Extreme Leukocytosis Following EVAR

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Affiliations: ¹Ohio University Heritage College of Osteopathic Medicine, Athens, Ohio; ²Western Reserve Hospital, Cuyahoga Falls, Ohio

Introduction: Postoperative leukocytosis is a well-known occurrence often due to inflammatory processes such as infection. However, extreme leukocytosis (WBC greater than 30,000wbc/hpf) is rare. Extreme leukocytosis without evidence of any inflammatory process is even more unusual, and requires investigation of malignant causes. **Case Description:** We present the case of a 76-year old male who developed an extreme leukocytosis after undergoing endovascular aneurysm repair. The patient initially presented to Barberton ED for right-sided chest pain and shortness of breath. A 7cm abdominal aortic aneurysm had been found on renal ultrasound several weeks earlier and was confirmed using CTA. He then underwent EVAR. On postoperative day 1 the patient was asymptomatic but developed a leukocytosis of 60,000wbc/hpf. Imaging/blood cultures were repeatedly negative. He remained asymptomatic and his extreme leukocytosis resolved by POD#3 without evidence of underlying inflammatory process. He was discharged on POD#4 and referred to Oncology for investigation of leukemoid reaction versus chronic myelomonocytic leukemia (CMML). **Discussion:** This report describes an unusual case of extreme leukocytosis in a postoperative patient necessitating investigation of malignancy. Leukemoid reaction is a common benign process while CMML is a rare and potentially lethal malignancy. Leukemoid reaction requires no further workup or treatment while CMML requires bone marrow biopsy, cytogenetic studies, and chemotherapy or stem cell transplantation. **Conclusion:** Surgery causes immense physiologic stress and can precipitate an extreme leukocytosis. Recognition of a benign leukemoid reaction versus a malignant leukemic reaction is vital to patient survival.

C42 Title: Primary Mesenteric Leiomyosarcoma with Metastasis to the Liver: A Case Report

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Affiliation: ¹West Virginia School of Osteopathic Medicine, Lewisburg, West Virginia; ²Princeton Community Hospital, Princeton, West Virginia

Introduction: Leiomyosarcoma (LMS) is a sarcoma that can arise from mesoderm. LMS of the mesentery accounts for less than 1% of gastrointestinal tumors and has a poor prognosis. We herein report a case of mesenteric LMS. **Case Description:** 79-year-old-male presented to the ER for left sided abdominal pain radiating to his right side. Upon not improving on conservative treatment, a CT was performed showing a mid-descending colonic mass and multiple masses on the liver, suspicious for metastasis. A colonoscopy was performed and was negative. Therefore, a diagnostic laparoscopy was done to further investigate. Liver biopsies were obtained and sent to pathology. A mesenteric mass was seen adjacent to the descending colon. Microscopic evaluation of the tumor revealed high-grade LMS. The patient had an unremarkable postoperative course. **Discussion:** Majority of patients will develop metastasis to the liver or lung. Most LMS's go undiagnosed until late in the course leading to a survival rate of 20-30%. In our patient, abdominal pain was the only presenting symptom after the sarcoma grew to 5.5cm. The only therapeutic modality proven to provide a cure is surgery. Adjuvant chemotherapy may prove beneficial in the complete remission of mesenteric LMS. Based on histological subtype, a specific regiment of chemotherapy can be tailored. **Conclusion:** LMS is difficult to diagnose

because of its similar presentation with other gastrointestinal diseases. While rare, it should be included on the differential diagnosis when a patient presents with abdominal pain. The rarity and complexity of pathology makes the discussion of treatment important.

C43 Title: Autoimmune Hepatitis

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Introduction: AIH is an immune-related chronic liver disorder of unknown etiology characterized by hepatocellular inflammation with progression to cirrhosis. **Case Description:** An 11-year old female being treated with for major depressive disorder and presented after laboratory monitoring identified persistently elevated liver enzymes, hyperbilirubinemia, hyperammonemia, thrombocytopenia, hypoalbuminemia and an abnormal INR. **Discussion:** AIH patients often present with protean symptoms such as general fatigue, appetite loss and lethargy. ~55% of patients present acutely, ~35% have a gradual onset of symptoms, and ~10% of patients are asymptomatic and present with an incidental elevation of liver transaminases. AIH is a diagnosis of exclusion. The diagnostic criteria for AIH include abnormal laboratory tests and periportal hepatitis on histology. While liver biopsy is the most important tool for diagnosis in AIH, the histopathologic findings in AIH are non-specific and thus can still be mistaken with the other types of hepatitis. AIH is characterized by infiltrative mononuclear cells, interface hepatitis, necrosis and fibrosis. Untreated AIH can lead to death in up to 90% of patients by 10-years from diagnosis. Immunosuppression is the mainstay of treatment. Appropriate medical management improves the prognosis, with a 10-year survival rate of up to 80%. Our patient was started on prednisone for treatment and will be followed by her gastroenterologists to see if her disease will respond to the immunosuppressive therapy **Conclusion:** AIH can lead to hepatic fibrosis, liver failure, and death if untreated. Liver biopsy is the preferred method of diagnosis and is characterized by infiltrative mononuclear cells and interphase hepatitis.

C44 Title: Pyoderma Gangrenosum and Sweet Syndrome of the Breast: A case report

Authors: Danielle Saldana, DO (PGY-4); Michael Elrod, DO

Affiliation: Grandview Medical Center, Dayton, Ohio

Introduction: Pyoderma Gangrenosum (PG) is a rare and rapidly spreading disease characterized by severe inflammation and ulceration of the skin. PG has an estimated incidence of 3-10 cases per million people per year. PG is neither infectious nor gangrenous but most commonly presents as an inflammatory papule or pustule. Sweet syndrome (SS) is an uncommon inflammatory disorder characterized by the abrupt appearance of painful, edematous, and erythematous papules, plaques, or nodules on the skin. Both diseases are more prevalent among patients with underlying systemic disease such as inflammatory bowel disease, hematologic disorders, arthritis. **Case description:** Our case is on a 52 year old otherwise healthy female who presented with left breast lesion later to be found to be both pyoderma gangrenosum and Sweet's syndrome. Patient's initial presentation to outside hospital was a pimple to her left breast. When she was seen at our facility it had turned into a necrotic superficial open wound that originally appeared similar to a brown recluse spider bite. Patient underwent intravenous antibiotics, surgical debridements and systemic steroids. **Discussion:** This case report reviews a very rare disease in general and even less seen involving the breast. This patient, due to the co-diagnosis of Sweet's syndrome, continued to progress with new lesions to her face and arms. **Conclusion:** Our discussion shows the importance of early, precise surgical debridement of only necrotic tissue as well as use of corticosteroids due to the resistance of antibiotic therapy.

C45 Title: Combined Pharmacologic Treatment of Catatonia: A review of 4 case studies and the literature of the last 2 years

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Catatonia is primarily a movement disorder described in the DSM-5 with symptoms consisting of inability or resistance to movement, lessened or inappropriate response to external stimuli, and mutism. The physiologic basis of the disease is postulated to be due to GABA-A hypoactivity, dopamine hypoactivity, and N-methyl- D-aspartate receptor (NMDA) hyperactivity in the striato-cortical and cortico- cortical pathways. Lorazepam and electroconvulsive therapy have been the most researched treatments for catatonia. However, not all cases are successfully treated with these options. Thus, there has been investigation into the use of NMDA antagonists. Currently there are no double- blind placebo-controlled studies on the use of combined treatment in this illness. Currently, C-L clinicians may use combined treatment as an initial strategy or as an adjunct treatment. The purpose of this case report and review was to evaluate the literature of the last 2 years on the combined use of NMDA antagonists and benzodiazepines in the treatment of catatonia. We also reached out to fellow Psychiatrists for unreported cases of treatment resistant catatonia where combined treatment options were utilized. We have 3 unique cases of catatonia which all involved combined treatment of lorazepam with NMDA antagonists and 1 with lorazepam with dextromethorphan/quinidine. In these 4 cases we document the change in the initial Bush-Francis Rating Scale, seeing improvement to near baseline levels. Combined treatment may be considered in Schizophrenia, Medical Catatonia, and comorbid medical causes, where benzodiazepine are less tolerated (i.e. worsening of delirium, and severe COPD) and prolonged untreated catatonia, which is less responsive to benzodiazepine.

C46 Title: Fluoroless HIS Bundle Pacemaker Implantation with Selective Capture

Authors: Ankur Shah, DO (Fellow)¹; Nagesh Chopra, MD²; Anish Amin, MD²

Affiliation: ¹OhioHealth Doctors Hospital, Columbus, Ohio; ²OhioHealth Riverside Medical Center, Columbus, Ohio

Background: Fluoroless techniques are still novel in the Electrophysiology (EP) laboratory. This case illustrates the selective His capture during pacemaker implantation without use of fluoroscopy. It is know that radiation is not devoid of its side effects and lifetime risks of malignancy and also carries orthopedic complications from those donning lead aprons. Fluoroless techniques have been something in the making in the EP laboratory and becoming more of a future. **Case Presentation:** In this case we present a pleasant 87 year old male with past medical history including typical atrial flutter, hypertension, and coronary bypass history who presented as an elective typical atrial flutter ablation. There were also future discussions for a watchman device in this patient due to anticoagulation intolerance. Our case ties in with the sinus node dysfunction that was appreciated post bidirectional flutter block requiring ventricular pacing. His family consented for emergent pacemaker and he underwent a fluoroless HIS bundle implantation to replicate physiology pacing. **Conclusions:** The discussion of less is more in the use of fluoroscopy is becoming more of a topic of discussion in the EP, and even the absence of fluoroscopy in implantation of devices is of more interest. The minimalist technique reduces many adverse side effects not only for the patient but even the operator, with this case highlighting successful results.

C47 Title: An Interesting Presentation of the Great Mimicker
Authors: Caitlin Shaheen, DO (PGY-2); Jeffrey Sobbecki, DO; Robert Palma, DO
Affiliation: OhioHealth Doctors Hospital, Columbus, Ohio

Acute kidney injury is a common problem among patients with growing incidence as well as morbidity and mortality. The differential diagnosis is vast and includes some common etiologies as well as rare causes. A 55 year old male with a past medical history of hypertension and pre-diabetes presented to his primary care physician with generalized weakness, fatigue and a 7 lb weight loss over the past 6 weeks. Routine lab work was ordered and showed hypercalcemia and acute kidney injury. Urine studies supported intrinsic renal disease. Further work up of the hypercalcemia revealed a suppressed PTH and an elevated 1,25-dihydroxyvitamin D and angiotensin converting enzyme level. A CT chest without contrast showed bilateral hilar lymphadenopathy. He underwent biopsy that showed noncaseating granulomas. He was diagnosed with sarcoidosis and started on 60 mg of prednisone daily with improvement in his creatinine. This patient was a unique demonstration of the several different organ systems that can be affected by sarcoidosis including the kidney. Over 90% of patients have pulmonary involvement, while less than 5% have renal involvement. It was postulated by consulting nephrologist that the patient's worsening renal function was multifactorial. While there was possibility that the hypercalcemia resulted in elevated creatinine, it is likely the patient had some degree of renal granulomas as his kidney function did not improve until the initiation of steroids. Sarcoidosis is a disease process that affects multiple organ systems. It is imperative to keep on the differential for several presenting clinical scenarios, including acute kidney injury.

C48 Title: A rare presentation of bilateral pleural effusion
Authors: Saurabh Sharma, DO (PGY-1); Rajnish Jesudoss, MD
Affiliation: Adena Regional Medical Center, Chillicothe, Ohio

80 year old female with mechanical fall had humerus fracture. Underwent ORIF. Patient had a difficult IJ cannulation and had a right subclavian cannulation on surgery day. 2 days after, patient developed acute hypoxic respiratory failure. Her CXR showed a right lower lobe opacity with bilateral pleural effusion. Bedside thoracentesis was performed on both sides on different days which was notable for milky fluid consistent with chylothorax. Pleural fluid analysis showed that her triglycerides were 480 mg/dL, cholesterol 66, the ratio of the pleural fluid cholesterol to triglyceride was <1. All are consistent with chylothorax with unclear etiology. Patient responded well to dietary modification and no further intervention was needed. **Discussion:** Usual causes are traumatic vs non-traumatic. Traumatic etiology here this fall or difficult central vein cannulation (unusual for right subclavian cannulation). The work up for non-traumatic causes like lymphomas, primary lung cancer, mediastinal, metastatic extra thoracic malignancies, sarcoma or leukemia were negative. Her chylothorax could be secondary to her fall leading to nonpenetrating trauma to the neck, thorax and upper abdomen. **Conclusion:** Chylothorax could be a finding with bilateral pleural effusion. It is imperative to do a definitive diagnosis by analyzing the pleural fluid. Most patients, ours included, who have chylothorax are successfully managed with conservative management like NPO or being on a medium chain triglyceride diet. However, sometime when no obvious cause can be delineated, then lymphangiography might be recommended with some case thoracic duct ligation.

C49 Title: Left Ventricular Non-Compaction: A Rare but Increasingly Relevant Etiology of Systolic Heart Failure
Authors: Jay Sheth, DO (PGY-3)
Affiliations: Adena Regional Medical Center, Chillicothe, Ohio

Introduction: While coronary artery disease, hypertension and tachycardia are common causes of heart failure, it is important to explore uncommon causes as those etiologies are often missed. We present a patient with new onset systolic heart failure with risk factors for alcoholic, viral, ischemic, and stress induced cardiomyopathy as well as family history of genetic cardiomyopathy. **Case Description:** A 53-year-old Caucasian male presented with CC of progressive shortness of breath requiring supplemental oxygen. Patient reported upper respiratory tract infection of three weeks, recent bankruptcy with loss of home and multiple deaths in the family, history of alcohol abuse, and tobacco abuse and vague family history of heart disease. Echocardiogram showed LVEF of 10-15% with severe left ventricular global hypokinesis. Left heart catheterization showed absence of coronary artery disease. Thereafter, patient remembered his sister having left ventricular non-compaction (LVNC). Patient was diuresed with furosemide and discharged on aspirin, statin, ACE inhibitor. He underwent outpatient cardiac MRI which showed evidence of LVNC. **Discussion:** LVNC is an anatomical disease with prominent left ventricular trabeculae, deep intertrabecular recesses, and thin compacted layer. LVNC is diagnosed by cardiac MRI and echocardiogram. With advances in imaging technology LVNC is becoming more recognized as cause of heart failure. Patients have increased risk for arrhythmias and may need AICD placement if ejection fraction does not improve after medical therapy. **Conclusion:** Elucidating etiology of heart failure can become very complex. It is important to obtain thorough history to explore uncommon causes and include LVNC in the differential.

C50 Title: Sepsis Caused by a Rare *Phialemonium* Isolate in a Patient with Chronic Diarrhea and Concurrent Space-Occupying Intracranial Lesion
Authors: Davis Shved, DO (PGY-3)
Affiliation: Adena Regional Medical Center, Chillicothe, Ohio

Introduction: The case of a 73 year-old female with a remote history of lung cancer and recent cataract surgery, who presented to the emergency department for the fourth time in a two week period with nausea, vomiting and diarrhea despite symptomatic treatment is discussed. **Case Description:** On initial presentation, the patient met clinical criteria for sepsis including leukocytosis, tachycardia, and tachypnea. Initial blood cultures revealed isolates of *Phialemonium*, an invasive mold species, rarely reported in humans. Antifungal therapy was added to her empiric treatment regimen targeting a presumed gastrointestinal source of infection. The patient was subsequently diagnosed, during this visit, with a metastatic brain mass requiring urgent neurosurgical intervention. **Discussion:** There are few case reports in the literature highlighting the management of *Phialemonium*. Our patient was initially started on intravenous Micafungin and transitioned to Caspofungin with significant improvement in her clinical course. Repeat blood cultures were negative. **Conclusion:** Limited information is known about the drug susceptibility of uncommon fungal isolates. The clinical course, management, outcome and lessons learned are presented in this case presentation.

C51 Title: Clinical Manifestations of Thromboangiitis Obliterans (Buerger's Disease)
Authors: Rohini Singh, BS (OMS-III); Maria Setlak, DO
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Introduction: Thromboangiitis Obliterans, also known as Buerger's Disease, is a rare condition characterized by inflammation and thrombosis of small to medium sized blood vessels of the extremities. Symptoms include vasospasms, pain, numbness, ischemia, and tingling of the

extremities. Management of this condition with smoking cessation and pharmacotherapy, such as vasodilators, is essential in preventing disease progression and tissue necrosis. This distinctive case report demonstrates the incorporation of topical vasodilators in an acute setting to prevent the progression of Buerger's Disease and potential gangrene of the digits. **Case Description:** A 41-year-old female presented to an outpatient clinic with a complaint of right index finger pain. The pain was gradual and had been occurring in a persistent pattern for 1 week. She described the pain as severe and presented to the ER one week prior where she was diagnosed with Raynaud's phenomenon and was given a prescription for Norvasc. She is a heavy smoker. **Discussion:** The detrimental effects of long-term smoking can lead to allergic, toxic, and autoimmune reactions that result in chronic inflammation. The attending physician suggested that we use Nitro Spray on the radial aspect of the wrist from the in-house pharmacy and applied 3 sprays to the inner aspect of the right wrist. Symptoms resolved 20 minutes later. **Conclusion:** This case demonstrates the importance of managing the detrimental effects of Buerger's Disease in chronic smokers. While various treatment modalities are available to control acute symptoms, the only way to prevent the progression of the disease is complete smoking cessation.

C52 Title: A Rare Presentation of Progressive Dyspnea - A Case Report
Authors: Jeffrey Sobecki, DO, BS (PGY-2); Kruti Patel, DO; Jeffrey Sobecki, DO
Affiliations: OhioHealth Doctors Hospital, Columbus, Ohio

Introduction: 5-aminosalicylic acid (5-ASA) and its derivatives are recommended for treatment of mild to moderate Ulcerative Colitis (UC). There have been documented reports of pulmonary toxicity with sulfasalazine, but few with 5-ASA components alone such as Mesalamine.¹ **Case Presentation:** A 68-year old female with history of UC on Balsalazide complained of worsening intermittent, non-radiating chest pain, orthopnea and dyspnea on exertion over 4 days but her symptoms initially started 3 months ago. Patient afebrile at 98.9, HR 115, BP 153/84, RR 22, SpO2 88% on room air. Physical exam revealed bibasilar crackles. EKG, chest x-ray and remainder of labs were unremarkable. Cardiac workup with catheterization and transthoracic echocardiogram (TTE) showed left ventricular ejection fraction (LVEF) of 30%. CT of the chest showed ill-defined nodular ground glass opacities. Rheumatologic and infectious workup was negative. Pulmonary function test showed no obstruction or restriction and decreased DLCO (51%). Bronchial alveolar lavage (BAL) showed lymphocytosis, moderate eosinophilia and plasma cells. Balsalazide was discontinued for concern of hypersensitivity pneumonitis (HP) and she was started on corticosteroids with resolution of symptoms and was weaned to room air. **Discussion:** Only four case reports of HP secondary to Mesalamine have been reported while no cases due to Balsalazide have been reported. HP diagnosis is difficult in the setting of inflammatory bowel disease (IBD) with concern of pulmonary manifestations of IBD. **Conclusion:** Patients are more commonly started on Balsalazide due to its superior effectiveness in induction than Mesalamine. With Balsalazide being used more commonly, HP needs to be considered in patients with pulmonary complaints.

C53 Title: Stiff Person Syndrome - A Case Report of a Commonly Misdiagnosed and Under Recognized Disease
Authors: Jeffrey Sobecki, BS, DO (PGY-2)
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Introduction: Stiff person syndrome (SPS) is a rare central nervous system disorder, specifically GAD-65 antibodies affecting GABA neurotransmission. A debilitating disease, SPS is likely underreported and underdiagnosed leading to treatment delay affecting life expectancy while impairing physical and mental capabilities. **Case report:** 42 year old woman presented for Neurology follow-up after failing acute treatment for multiple sclerosis (MS) with Solumedrol after MRI showed enhancement of the left optic tract. She complained of continued muscle twitching and spasms, episodic memory loss, tripping/falling, loss of sensation/tingling in bilateral hands and feet, vertigo and fatigue. Physical exam showed decreased peripheral vision bilateral, involuntary extremity movements, decreased sensation to pain and vibration in stocking-glove pattern, and reflexes with brisk mute Babinski's three beats of bilateral clonus. Labs showed GAD65 antibody 32 U/mL (range <11 U/mL). Patient diagnosed with SPS and prescribed Baclofen, Gabapentin, Valium and Zanaflex. After neurology follow-up she presented to the hospital complaining of increased pain and muscle ache with significant somnolence after taking additional home medications. Vitals normal. Physical exam showed mild increase in muscle tone of lower extremities with decreased pain and vibration. Neurology stopped Zanaflex and started Plasma Exchange (PLEX) therapy for SPS flare with improvement to baseline. **Discussion:** SPS typically presents insidiously with progressive stiffness and muscle spasms leading to falls, fractures, fear of falling and task-specific phobias. Limited clinical trials have shown few medications benefiting patients. SPS puts patients at risk for autoimmune diseases and paraneoplastic malignancies. **Conclusion:** SPS is rare and under recognized, often initially misdiagnosed leading to debilitating daily life.

C54 Title: Thromboangiitis Obliterans: Changing Demographics for a Preventable Disease
Authors: Ryan Stefancik, BS (OMS-III)¹; Donald Brown, DO²
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Introduction: Thromboangiitis Obliterans (TAO) is a rare small-vessel vasculitis strongly associated with cigarette smoking that can cause vessel destruction and necrosis of distal extremities possibly leading to amputation. The disease is a diagnosis of clinical exclusion due to the still unknown pathogenesis and is characterized by vessel damage via cycles of thrombosis and recanalization. Classic cases of TAO involve males between the ages of 20-40 years old. More recently however, the patient population has been shifting to include more women and elderly patients. **Case Description:** A 46-year-old Caucasian female with a significant history of cervical cancer, anticardiolipin antibody syndrome, peripheral artery disease, and hyperlipidemia. The patient has had multiple aortic and peripheral vascular stents placed. Angiography shows obliteration of the left lateral plantar artery and left calcaneal arterial anastomosis, as well as the tortuous medial plantar artery, all pathognomonic for TAO. **Discussion:** Historically, the most data about the progression of TAO has been through case studies on the typical 20-40-year-old Asian male patients. Changing patient demographics requires insight into how the disease presents outside of the conventional patient population. **Conclusion:** As the population of patients with TAO begins to shift it is important to follow the disease progression in the rising demographics of both women, and those over 40 years old. The patient reported on falls under both categories and has not shown severe symptoms of the disease so far, giving an opportunity to study disease progression and recovery in these populations.

C55 Title: Candy Canes Year Round - A Case Report of Acute Esophageal Thermal Injury
Authors: Mitchell Stelzer, DO, MPH, BS (PGY-3); Jeffrey Sobecki, DO, BS; Kruti Patel, DO
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Introduction: Acute esophageal thermal injuries are rare injuries with unknown prevalence. However, most of the documented acute esophageal thermal injuries are secondary to hot liquid while solid food thermal injuries are rare. Patients typically present with chest pain, dysphagia, odynophagia and epigastric pain. **Case Presentation:** A 40-year old female presented complaining of odynophagia and burning sensation in the chest following ingestion of a hot sweet potato earlier in the day. EGD on day 2 showed moderately severe acute esophagitis

in the upper and middle esophagus secondary to ingestion of hot food. The patient was diagnosed with thermal injury and was started on sucralfate, pantoprazole and viscous lidocaine. Repeat EGD 9 days later showed changes consistent with thermal injury but improved appearance since previous EGD. Patient was discharged after symptoms improved but returned to the hospital 3 weeks later with odynophagia. Repeat EGD showed normal esophageal mucosa. **Discussion:** Patients presenting with chest pain, dysphagia, odynophagia or epigastric pain after having hot food or drink need to have acute esophageal thermal injury as one their myriad of differential diagnoses. Acute thermal injuries of the esophagus typically have good prognoses with conservative management and proton pump inhibitors. Continuing to monitor patients with follow up EGD can show progression from acute esophagitis then red and white linear mucosal bands/pseudomembranes (resembling a candy cane) and finally normalized esophageal tissue. **Conclusion:** Hot liquid and solid foods can lead to acute esophageal thermal injuries and with accurate diagnosis patients can have good prognosis.

C56 Title: Hepatitis B Virus Related Cryoglobulinemic Vasculitis
Authors: Aili Swan, BA (OMS-III); Lauren Langenderfer, BS (OMS-III)
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Introduction: Cold-reactive immunoglobulins, precipitate at temperatures lower than 37° C forming damaging immune complexes. Cryoglobulinemic vasculitis (CryoVas) is the manifestation of this process, which occurs in the small vessels of the skin, peripheral nervous system, kidneys, and joints. Cryoglobulin-containing immune complex deposition leads to inflammation and vessel destruction resulting in palpable purpura, myalgias, arthralgias, peripheral neuropathy, and glomerulonephritis. We report a rare case of CryoVas incited by hepatitis B. **Case Description:** A 68-year-old man with a history of alcohol abuse and liver cancer presented to the hospital with bilateral ankle swelling, pain, and pruritus for the past week. Physical examination revealed non-blanchable petechiae and palpable purpura of the lower legs extending distally to the toes in addition to a single 2cm x 3cm ulcer on the lateral right lower leg. Based on laboratory results and the clinical picture, a diagnosis of cryoglobulinemic vasculitis due to HBV was made. **Discussion:** Three subtypes of cryoglobulinemia exist. Type I consists of monoclonal IgM and causes vascular occlusion without vasculitis. Types II and III consist of monoclonal and polyclonal IgM or IgG that have rheumatoid factor activity against polyclonal IgG. These immune complexes are the cause of CryoVas and its potential for severe disease. **Conclusion:** Cryoglobulinemic vasculitis is the manifestation of a serious underlying disease. While hepatitis C is the likely culprit, other etiologies such as hepatitis B should be considered. Our patient was started on prednisone and referred to gastroenterology for treatment of his hepatitis B. He was lost to follow-up.

C57 Title: Tongue Abscess Mistaken for Angioedema: Report of a Rare Entity and Review of the Literature
Authors: Jessica Ball, DO, MPH; Jordan Teitelbaum, DO Christopher Selinsky, DO
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Introduction: Swelling of the oral tongue in a clinical setting raises the concern for upper airway obstruction thus necessitating prompt and proper diagnosis and management. We report a case of a patient treated for idiopathic angioedema who in actuality had abscess formation within his tongue musculature. **Case Description:** We present the case of a 44-year-old male who presented to the Emergency Department with oral tongue swelling. He was admitted under the presumptive diagnosis of angioedema and treated with systemic glucocorticoids and antihistamines. He was discharged but returned the next day with worsening tongue edema and pain. When CT scan was unrevealing due to dental artifact, the Otolaryngology team was consulted. Exam and further transoral ultrasound demonstrated a right oral tongue abscess. The patient was taken urgently to the operating room for incision and drainage, and had an uneventful recovery with rapid improvement in his symptoms. **Discussion:** Infections of the tongue are extremely rare, and abscess formation within the oral cavity is also uncommon. We review several cases of tongue abscess and the approaches to making this diagnosis and ruling out other entities. Furthermore, we examine the multidisciplinary approach to managing this case with relevant contributions across specialties. **Conclusion:** In cases of upper airway swelling, comprehensive approaches to pursue accurate diagnosis are paramount. Though tongue abscess is a rare pathology, proper rendering of treatment can contribute to decreased patient pain and decreased hospital stay, as well as diminish unnecessary treatments that may exacerbate the original disease.

C58 WITHDRAWN

C59 Title: Management of cholecystocholedochal fistula in a community hospital
Authors: Lahari Vudayagiri, BS, BA, DO (PGY-1)¹; Omar Mujahed (OMS-III)²; Logan Mellert, DO¹; Rick Gemma, DO, FACOS¹
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Introduction: Mirizzi syndrome (MS) is a rare complication of chronic cholecystitis caused by the gallbladder wall compression of the common hepatic duct (MS1) or as acholecystocholedochal fistula (MS2). The reported incidence is only 0.06%-5.7% amongst patients with symptomatic cholelithiasis. Patients often present with obstructive jaundice and right upper quadrant abdominal pain; symptoms not clinically unique from biliary colic or cholecystitis, and often misdiagnosed pre-operatively. **Case Description:** We present the case of a 76-year-old female, initially diagnosed with chronic cholecystitis, who was found to have MS2 in intraoperatively. She denied prior history of abdominal surgery or biliary instrumentation. The patient underwent a subtotal cholecystectomy with common bile duct exploration, t-tube placement, and wide local drainage. She progressed well and was discharged home on hospital day 7 with outpatient hepatobiliary surgery follow-up. At 1 month follow-up, patient had t-tube output of 200-300cc per day with remaining drains having diminished output. **Discussion:** Surgical management of MS1 is generally laparoscopic or open cholecystectomy. Management of MS2 is complex and dependent on anatomic and pathologic factors. Surgical repair generally focuses on biliary-enteric reconstruction, with cholecystocholedochoduodenostomy or Roux-en-Y hepaticojejunostomy. Conservative surgical approach with subtotal cholecystectomy, common bile duct exploration, and biliary drainage is also reported as a safe alternative option⁶. **Conclusion:** As presented in this case, MS is a rare complication of chronic cholecystitis, and can be a cause of cholecystocholedochal fistula, which is often discovered intraoperatively during cholecystectomy; general surgeons should be familiar with conservative management of often discovered intraoperatively MS.

C60 Title: Cascading Complications
Authors: Christopher Wasco, BS (OMS-III)¹; Alisha Mills, Nurse Practitioner²; A. Gabriel Majjub, MD, PhD²
Affiliations: ¹Ohio University Heritage College of Osteopathic Medicine, Athens, Ohio; ²Marietta Memorial Hospital, Marietta, Ohio

Introduction: Anterior cervical fusion (ACF) is a common spine surgery with rare complications such as nerve damage, hoarseness, and dysphagia. **Case Description:** A 75-year-old male presented to his primary care physician with neck pain. Physical examination revealed cervical

hyperlordosis and pain with motion. Magnetic resonance imaging confirmed cervical spondylosis and an ACF was scheduled. On postoperative day 2, he presented to the emergency department (ED) with dysphonia. Computed tomography (CT) of the neck identified a retropharyngeal abscess (RPA) from C2-C7 compressing the trachea. After tracheostomy, the RPA was drained surgically. One week later, he presented to the ED with tachypnea after spontaneous resolution of lower leg edema. After a negative electrocardiogram and troponin level, he was discharged. With no improvement over the course of a week, he presented to a different ED where a CT Angiogram was performed revealing burden of flow in the pulmonary arteries. The patient was started on a heparin drip and life flighted to a tertiary care center where the emboli subsequently resolved. **Discussion:** This case illustrates the potential to develop multiple complications from surgery. Appropriate precautions and prophylactic measures like anticoagulation, early ambulation, and antibiotics must be considered in high risk patients. Recognition of post-surgical complications is critical to patient care and appropriate therapy for prevention of morbidity and mortality should be explored. **Conclusion:** While rare, post-surgical complications must always be considered by the surgeon and expressed to the patient.

C61 Title: A Life-Threatening Cause of "Shoulder Pain"
Authors: Joel Willis, DO, PA, Phil, MA (PGY-3); Michael Wells, BS; Carl Tyler, MD, MSc
Affiliations: Cleveland Clinic, Cleveland, Ohio

Introduction: Clinically serious delays in diagnosis may occur through an interplay of cognitive errors by clinicians in the context of health systems-related factors. We analyze a case of delayed musculoskeletal diagnosis and offer multi-level strategies to lower risk for misdiagnosis. **Case:** A 50 year-old female with a history of morbid obesity, diabetes and multiple pain management procedures for chronic low back pain presented to the emergency department (ED) the day following acute onset of right shoulder pain. ED documentation of musculoskeletal examination was simply "normal range of motion." X-ray of shoulder detected no acute pathology. She was diagnosed with "acute strain of rotator cuff capsule." Within 48 hours she was evaluated by an orthopedic surgeon and a second time in the ED. A re-examination by a family medicine resident physician just prior to anticipated discharge from the ED led to definitive diagnosis of septic sternoclavicular joint infection and neck abscess. **Discussion:** Even with rapid access to emergency and specialty care, diagnostic delay may occur. We hypothesize that misrepresentation of patient's illness as "shoulder pain" and over-reliance on plain film imaging led to premature diagnostic closure that was reinforced by repeated examinations by multiple physicians. We will summarize the multifactorial dimensions of diagnostic inertia in relation to serious musculoskeletal disorders, including clinical reasoning skills, the importance of detailed serial physical examination, and potential biases toward patients with morbid obesity and chronic pain. **Conclusion:** We propose potential remedies to cognitive errors and systems-based factors that can avert delays in definitive diagnosis.

C62 Title: Idiopathic Internal Jugular Venous Pseudoaneurysm in a Patient with a Traumatic Lumbar Fracture
Authors: Timothy Wolff, DO (Fellow); M. Chance Spalding, DO, PhD
Affiliations: OhioHealth Grant Medical Center, Doctors Hospital, Columbus, Ohio

Introduction: Internal jugular venous (IJV) aneurysms are rare entities. Since 1952, only 35 cases have been reported. We discuss an individual with an IJV pseudoaneurysm (IJVP) presenting 11 days after the trauma. **Case Description:** A 75 year-old, non-smoking, female was admitted for a L1 burst fracture after falling onto her back 2 days prior to presentation. Her history was significant for CHF, hypertension, atrial-fibrillation on warfarin, type 2 diabetes, and ESRD. Initial physical and CT examinations were unremarkable for other abnormalities. She underwent T11-L3 posterior fusion on hospital day 3. Right-sided neck swelling presented on day 9. CT neck angiography revealed a right IJVP measuring 15.3 cm. She died from septic shock 2 days later. **Discussion:** Secondary venous aneurysms typically arise from direct trauma, inflammation, degenerative processes, mechanical stress, and venous hypertension. Interestingly, this individual had no prior history of neck trauma or central venous catheterization. Other cases reported IJVPs in the setting of CHF and severe tricuspid regurgitation, however, our patient's EF was 55% and she had only trace tricuspid regurgitation. Her pseudoaneurysm may have initiated from elevated CVP during her surgery, followed by a combination of volume overload and vessel wall inflammation secondary to MRSA pneumonia. To our knowledge, this is the first report of an idiopathic IJVP occurring distant to the surgical site. **Conclusion:** Regardless of its uncommon frequency, IJVPs should be considered in the differential diagnosis of neck masses even in the absence of known predicating factors. Additionally, these entities can occur in non-surgical sites in the setting of operative intervention.

C63 Title: 44 year old with DKA presentation diagnosed with ejection fraction of 15% to 20% linked to amphetamine use
Authors: Zia Nida, DO (PGY-1)
Affiliations: Adena Regional Medical Center, Chillicothe, Ohio

Introduction: Congestive heart failure is a common diagnosis but is rarely considered in a patient without any cardiac symptoms. It is also rarely diagnosed in a younger patient without any physical exam findings such as lower extremity edema, crackles or S3 heart sound. **Case Description:** A 44 year old male with BMI of 23 with history of type 1 diabetes presented to the hospital complaining of aphasia and left extremity weakness. Laboratory findings showed glucose of 800 with HA1c of 17. Neurological symptoms resolved after initiating DKA treatment but he continued to have persistent tachycardia, without edema or crackles. Subsequently, TTE was conducted which showed ejection fraction of 15% to 20% with a finding of coronary thrombus. **Discussion:** Tachycardia and fatigue can be caused by numerous illnesses. Once emergent causes are ruled out, congestive heart failure should be considered regardless of age or lack of physical exam findings if clinical suspicion is high. Additionally, not all patients are foretelling of their nonpharmacological drug use as this patient did not admit to amphetamine use until later. Although amphetamine use alone can attribute to tachycardia, rarely in can result in systolic dysfunction and increases risk of coronary thrombus. Both of which were found in this patient. **Conclusion:** Congestive heart failure is a common diagnosis mostly in elderly patients but unexplained tachycardia should preclude further workup, especially in patients with history of amphetamine use. Amphetamine use can cause systolic dysfunction and less frequently coronary thrombus and early diagnosis can improve morbidity.

Exhibition Abstracts

- E1 Title:** Can the Cost of Board Preparation Impact Primary Care Residency Intention?
Authors: Phillip Bucur, MBA (OMS-III); Vikrant Bhatnagar, MBA; Sebastian Diaz, PhD, JD
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Introduction: The primary care physician shortage in the United States has warranted investigation into how medical education debt influences medical students' interests in primary care residencies. However, sparse research has studied how board preparation costs relate to career choice. **Objective:** This study sought to determine if the cost of board preparation and examination impacts osteopathic medical students' intentions to enter primary care residencies. **Methodology:** Using a non-experimental survey design, this study asked respondents to evaluate the following: "I plan to enter a Primary Care Residency (Family Medicine OR General Internal Medicine OR Pediatrics)" using a Likert scale. Respondents were also asked to select which board examination(s) and pertinent resource(s) they had purchased. Total costs were calculated per respondent. **Results:** 1,280 osteopathic medical students participated in our survey, providing a 4.95% response rate. The distribution of respondents' interests to pursue primary care residencies and costs spent on board preparation yielded a "U" shaped curve. Respondents who Strongly Disagreed and Strongly Agreed to the statement "I plan to enter a Primary Care Residency" spent \$5,744 and \$5,070 on board preparation and examination, respectively. No statistically significant differences were found between the costs of preparing and sitting for board examinations and intention to enter primary care residencies when individuals were grouped by year in school and gender. **Conclusions:** Our findings further illustrate that educational costs and debt do not have a significant effect on students' intentions to enter primary care residencies. It becomes clearer that to solve the primary care shortage, future studies should investigate non- financial career influences.

- E2 Title:** Learning Professional Identity through use of Reflection and Service Learning
Authors: Leanna Chrisman-Khawam, MD, MEd, Faculty; Joel Manzi (OMS-II)
Affiliations: Ohio University Heritage College of Osteopathic Medicine, Cleveland, Ohio

The role of professional identity development has been established in the literature as a significant element of the hidden curricula in medical education. Many medical school programs struggle to provide explicit instruction on the development of a professional identity. Still other medical schools suffer from the hidden curricula borne of burned out health professional educators and current frustrations in a poorly designed health care system with poor health outcomes to match, and these hidden (or non-explicit) curricula can negatively impact professional identity. Service learning initiatives are a popular trend in medical education that offers medical students early clinical experience and an opportunity to develop professional identity. Currently, empathy is missing from models of professional identity development. The researchers aimed to determine through the examination of reflective essays what role participation in service learning and what intentional reflection can lead to the understanding of development of both empathy and a professional identity.

- E3 Title:** Manual Therapy for Primary Muscle Tension Dysphonia: Contrasting Approaches by Speech Language Pathologists and Osteopathic Physicians
Authors: Darcey Hull, MA (OMS-IV); Sajid Surve, DO
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Scheduled to launch in the fall of 2018, Ohio University Heritage College of Osteopathic Medicine's Pathways to Health and Wellness Curriculum is a four year osteopathic curriculum that fosters: horizontal and vertical integration of foundational content; opportunities for multiple elective and/or selective pathways at all campuses; longitudinal themes throughout the curricular design; formative assessments that drive learning; inter-professional approaches to curriculum delivery; and protected time for student and faculty development, wellness and creativity. Foundational sciences and clinical skills are integrated throughout all years of medical education, in which disciplinary divisions are blurred and woven together with elements of wellness, reflective practice and generalism to shape an osteopathic approach to patient care. Classroom learning experiences emphasize active, authentic learning in which learners apply concepts learned through self-directed study and laboratory-based experiences designed to complement and reinforce patient presentations. Students and faculty will benefit from the focus on personal health and well-being. An emphasis on Health Systems Sciences and inter-professional experiences will closely align with the new single-accreditation system for graduate medical education. All this aligns with HCOM's commitment to: provide a clinically integrated, learning-centered, osteopathic medical education continuum for students, interns, residents and primary care associates; embrace diversity and public service; and improve the health and well-being of underserved populations.