The Sixth Annual
Osteopathic Poster Exhibition and Competition

Competitor
and
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Abstracts
Biomedical/Clinical Competition Abstracts
B1 Title: The Routine Use of Tranexamic Acid (TXA) Decreases Transfusion Rates and Financial Costs in Total Knee and Hip Arthroplasty
Authors: J. Freeland Ackley, DO (PGY 4); Robert Hampton, DO; Gordon Preston, DO
Affiliations: 1Cleveland Clinic Foundation/South Pointe Hospital, Cleveland, Ohio; 2Ohio University Heritage College of Osteopathic Medicine, Athens, Ohio

Introduction: TXA is an option to decrease major blood loss and postoperative anemia following TJA. The primary objective of this retrospective study was to evaluate/confirm that intraoperative TXA decreases transfusion rates in patients undergoing TJA. Secondly, to determine if it’s more economical to prevent postoperative anemia following TJA with the use of TXA rather than treatment with an allogenic blood transfusions postoperatively. Methodology: 275 total joint replacements were conducted during the study. Results: The primary joint transfusion rate significantly decreased from 54 in 234 patients (23.1%) to 2 in 41 patients (4.88%) after the initiation of TXA administration (P=0.014). The transfusion rate in primary THA decreased significantly as well from 18 in 78 patients (23.08%) to 0 in 20 patients (0%, P=0.02). The primary unilateral TKA transfusion rates also decreased from 21 in 125 patients (16.8%) to 1 in 17 patients (5.88%). When comparing the average cost between patients, a difference of over $400 per case was observed with TXA. Conclusion: Allogenic blood transfusions are associated with a variety of complications that can increase patient’s morbidity, hospital costs and cost to the patient. With current changes in healthcare including bundled payments and decreased reimbursements, with rising healthcare costs, it’s important for physicians to strive to stay financially prudent; therefore, every effort should be made to do the best surgery possible for the patient in the safest, most cost effective manner. TXA decreases costs directly by being inexpensive and indirectly by decreasing blood transfusion rates, which decreases the amount of post-transfusion complications and significantly for our study group hospital length of stays.

B2 Title: The Outcome of Visceral Artery Aneurysms Treated with Endovascular Coiling at a Community Hospital Setting
Authors: Adem Aktas (OMS III); Christine Ou, DO; Gregory Kasper, MD
Affiliations: 1Kansas City University of Medicine and Biosciences, Kansas City, KS; 2Mercy St. Vincent Medical Center, Toledo, Ohio

Introduction: Visceral artery aneurysms (VAA) present as a unique set of vascular arterial disease that are uncommon but can present with high morbidity and mortality due to their risk of rupture. With the advance in technology, surgical procedures such as laparoscopic, percutaneous, and endoluminal hepatobilary interventions has resulted in an increase in VAA. Autopsies have revealed aneurysms in 0.01-2% of individuals. Pseudoaneurysms, on the other hand, can occur after trauma or inflammations which include pancreatitis, autoimmune disorders, vascular interventions. Most patients are asymptomatic but symptoms can arise, developing as abdominal pain, hypotension, vomiting, diarrhea, and hemorrhage. Surgical options have included open repair, ligation of aneurysm with or without end organ resection, and resection of aneurysm with revascularization. Several large center reports have shown a success rate of upwards of 98%. This review is to investigate the outcomes of endovascular coiling techniques in a community hospital setting. Objectives: To investigate how many endovascular coiling repairs are done each year by a private vascular practice group on patients with visceral artery aneurysms and to describe the immediate and long term outcomes of patients who have undergone interventional coiling of VAA’s in a community setting. Methodology: Retrospective, observational case series design. Time frame is January 1, 2005 until February 28, 2015. Results: Results pending. Summary: Endovascular coiling techniques have shown to have a successful outcome in a community setting comparable to large multicenter facilities.

B3 Title: Concussion Reporting Practices of Adolescent Student Athletes in Central Ohio
Authors: Brandon Arehart (OMS II); Jacob Boucher, MD; Trevor Kitchin, MD
Affiliations: 1Ohio University Heritage College of Osteopathic Medicine, Athens, Ohio; 2OhioHealth/Grant Medical Center, Family Medicine Residency, Columbus, Ohio

Introduction: Increasing nationwide concern for concussions in athletes has driven the requirement of medical professionals to focus their attention on diagnosing and caring for these traumatic brain injuries. However, studies have shown that up to 50% of concussions go undetected or unreported. Objectives: To obtain information on the number of concussions, concussion knowledge, and concussion reporting practices in central Ohio adolescent athletes. Methodology: Via a cross sectional, de-identified survey, the authors sampled a total of 357 student-athletes at OhioHealth pre-participation physicals representing all 6 Ohio high school athletic divisions in various contact and non-contact sports. Results: Of the athletes surveyed, nearly 20% (n=67) had sustained a concussion previously. Of these 67 athletes, approximately 25% reported having multiple concussions prior, only 46.8% (n=29) reported their injury to an athletic trainer or physician, 16.1% (n=10) reported only to a parent or coach, and 7.4% (n=5) did not report their injury at all. Concussions were also reported in both contact and non-contact sports. There proved no significant difference in reporting non-concussive versus concussive injuries (p=0.129). Lastly, 52.1% of the surveyed athletes were unaware of the Return-to-Play law, even though the vast majority understood that athletes cannot return to play the same day (89.6%), and that one must be cleared by a medical professional to return (97.5%). Conclusion: These results suggest the need for continued education in all central Ohio student-athletes concerning concussions, their symptoms, and how to properly report these injuries.

B4 Title: Evaluation of Pediatric Vision Screening and Referrals at an Academic Family Medicine Practice
Authors: Nicole Ascanio, MD (PGY2); Brandon Baartman, MD (PGY3); Carl Tyler, MD, MSc
Affiliations: Cleveland Clinic Foundation/Fairview Center for Family Medicine, Cleveland, Ohio

Introduction: The prevalence of undetected vision problems in school age children is estimated to be between 5 and 10 percent. Primary care physicians are responsible for appropriate screening and referral of children at risk for long-term visual morbidity. While many studies have investigated the sensitivity of various visual screening guidelines, few have evaluated referral outcomes in real-life clinical practice. Objectives: To evaluate patterns of pediatric vision screening in academic family medicine center and outcomes of pediatric vision specialist referrals. Methodology: Retrospective chart review of all patients under the age of 15 referred to pediatric vision specialists in a 5-year period. Results: This is a work in progress. We will characterize our present pediatric vision screening practices and describe the indications for and outcomes of pediatric vision specialty referrals. Summary: Based on our study findings, we plan to modify our family medicine residency clinic pediatric vision screening protocol, develop family medicine postgraduate educational resources and tailor practice supports to improve pediatric vision care.
B5 Title: Examining the Effect of Anacardic Acid Alone or in Combination with Chemotherapeutics on Pancreatic Cancer Cells
Authors: Melodie Blackmon (OMS II); Scott Craver; Valerie Eversol; Danielle Upton
Affiliation: University of Pikeville, Kentucky College of Osteopathic Medicine, Pikeville, Kentucky
Introduction: Pancreatic cancer is the 4th leading cause of cancer related death and its incidence has risen steadily. Although anti-cancer drugs have been developed based on the new molecular findings, the chemotherapy has produced unsatisfactory results due to chemotoxicity and chemoresistance. Thus, a new therapeutic regimen is in urgent need for pancreatic cancer patients. Objectives: The specific objectives of the present study are to investigate the anti-tumor effects of Anacardic Acid (AA) on pancreatic cancer cell growth, examine the synergistic effect of AA on Gemcitabine or 5-Fluorouracil, and explore the underlying molecular mechanisms of Anacardic Acid. Methodology: After treatment with AA, Gemcitabine or 5-Fluorouracil individually or in combination, we determined cell viability with cell number count and MTT assays. In addition, we performed 3D spheroid formation assays to examine the effect of AA alone or in combination with the chemotherapeutics in a tumor environment. Western blot analysis and immunostaining were performed to investigate the underlying mechanisms of AA. Results: Our preliminary data indicates that AA induced growth inhibition in pancreatic cancer cells in cell viability and 3D spheroid formation assays. In addition, AA potentiated the anti-cancer activity of Gemcitabine or 5-Fluorouracil in cell viability and spheroid formation assays. Mechanistically, AA appears to exert its anti-tumor activity via the activation of tumor suppressors, Chromatin Modifying Protein 1A, Ataxia Telangiectasia Mutated, and p53. Conclusion: Our data suggests that cashew nuts and mangos, which contain a number of Anacardic Acids, are promising complementary supplements to slow the initiation or progression of pancreatic cancer.

B6 WITHDRAWN

B7 Title: Common Carotid Artery Branching Patterns and Subclavian Artery Course in Patients with a Left Aortic Arch and Aberrant Right Subclavian Artery
Authors: Sean Carlson, DO (PGY 6)1,2; John Gowdy, DO2; Michael Markovic, MD2; Thomas Poulton, MD2; Stephen Passerini, MD2
Affiliations: 1 Nationwide Children’s Hospital, Columbus, OH; 2 Aultman Hospital, Canton, Ohio
Introduction: An aberrant right subclavian artery (ARSA) is a common vascular anomaly. According to various sources, the ARSA most often courses posterior to the esophagus, but may course between the trachea and esophagus in up to 15% of cases. The ARSA may also be associated with a common carotid trunk. Objectives: The objectives of this study were to evaluate the course of the ARSA in relation to the esophagus and determine the prevalence and mean length of a common carotid artery trunk. Methodology: In this retrospective single institution study, 322 patients with a left aortic arch and ARSA were imaged from October 2005 to May 2015. The course of the ARSA relative to the esophagus was evaluated in all 322 patients. Of the 322 patients, 264 patients had contrast-enhanced CT exams which permitted evaluation for a common carotid artery trunk. Results: The ARSA coursed posterior to the esophagus in 322 (100%) of 322 patients. Of the 264 subjects with a left aortic arch and adequate contrast-enhanced CT exams, 136 patients (52%) had a common carotid trunk with a mean length of 7.5 mm. Summary/Conclusion: The ARSA coursed posterior to the esophagus in our entire study population. In contradistinction to cited estimates, a course between the esophagus and trachea or anterior to the trachea in adults is likely a rare event. In patients with a left aortic arch and ARSA, a common carotid trunk is found in just over half our population, a figure higher than previously cited.

B8 Title: Community Engaged Approach to Establishing Interprofessional Health and Wellness Clinic in Rural Appalachia
Authors: Sarah Castiglia (OMS I)1; Obianuju Eziolisa (OMS I)1; Saba Zewdu2; Eric Dushimimana2; Tiffany Loftus; Sharon Casapulla, PhD2
Affiliations: 1 Ohio University Heritage College of Osteopathic Medicine, Athens, Ohio; 2 Ohio University International Developmental Studies Program, Athens, Ohio
Introduction: Many rural communities experience a shortage of healthcare professionals. Perry County, the fourth poorest county in Ohio, is considered a Primary Care Health Profession Shortage Area (HPSA). The doctor-to-patient ratio in Perry County is approximately 1:4500, with only 3 physicians currently accepting new patients. To increase access to care for the residents of the isolated communities in the southern half of the county, a local community group has been working to establish a health and wellness clinic in New Straitsville. Understanding community assets, health needs and priorities, and gaining community involvement are important first steps in developing a sustainable community health and wellness center. This poster presents preliminary results of a survey to begin to understand the needs and priorities of the residents of southern Perry County. Objective: To survey residents of southern Perry County about community medical needs. Methodology: As part of the larger initiative to gather information about community health needs, a pilot survey was administered to residents of Perry County in December 2015 asking them to rank a list of options for the future clinic. The list of options included different specialties, preventative medicine, and access increased urgent care. There were 27 respondents. This survey will be redistributed to increase participants. Preliminary Results: Comparing participants’ top 3 choices revealed that urgent care and having a clinic open on evenings and weekends were ranked higher than other categories. Conclusion: Increased access to care was the highest need/priority of Southern Perry County.

B9 Title: Predicting Thyroid Malignancies with Fine-Needle Aspiration and Frozen Section Biopsies
Authors: Maria Compton, DO (PGY V); Phil Khalil, DO
Affiliation: Western Reserve Hospital, Cuyahoga Falls, Ohio
Introduction: Fine-needle aspiration and frozen sectioning are commonly used to guide a surgeon in management of thyroid masses. Reports of the diagnostic validity of these measures are variable. It is helpful in patient management to review how these tests relate to thyroid malignancy diagnosis at this institution. Objective: The study reviews thyroid pathology compared with fine-needle aspiration and frozen section results. Methodology: This is a retrospective chart review of thyroidectomy and thyroid lobectomy cases with have accompanying FNA and/or frozen section studies. Results: Of the 19 FNA’s performed, one suggested benign disease when a malignancy was evident on final pathology, 4 showed atypia and ended up being malignant and 4 were insufficient for diagnosis on FNA and the final pathology was a malignancy. Of the 18 frozen sections completed on these patients, 3 suggested a benign pathology when the final diagnosis was a malignancy. No frozen section result of malignancy had a final pathology of benign. Conclusion: The combination of FNA and frozen sectioning is the highest yield for identifying thyroid malignancies, identifying a malignancy 71% of the time. Frozen sectioning identifies malignancies more reliably than FNA (63% of cases versus 31% of cases). Cases with atypia on FNA (Bethesda 5-15% risk of malignancy) a malignancy was identified 100% of the time. The results suggest that it is in the best interest of the patient to complete a more invasive diagnostic procedure. Any patient with an inefficient FNA should be counseled that further workup should be completed.
B10 Title: Sinusitis: Necessary Optimal Treatment – The SNOT Study
Authors: Thomas Cowan, MD (PGY 2); Ruheena Sadi, MD; Colin Turney, MD; Brandye Singleton; Lyndsey Vance, RN; Andrew Sitzmann, MD; Philip Berger, MD
Affiliation: Mount Carmel St. Ann’s Family Medicine Residency Program, Columbus, Ohio

Introduction: Antibiotics are prescribed in about 80% of office visits for URI and sinusitis nationwide despite estimates that bacterial infection is present in less than 2% of episodes. Treatment of viral infections with antibiotics leads to side effects and bacterial resistance. Objectives: We sought to decrease inappropriate antibiotic prescriptions for URI and sinusitis in our practice. Methodology: The Choosing Wisely guidelines for prescribing antibiotics were fewer of 101.5 or higher, severe sinus pain, concurrent skin infection, worsening symptoms after initial improvement, or symptoms greater than seven days. Multiple interventions were performed for providing education on prescribing guidelines. Physicians and staff were educated on guidelines for appropriate use of antibiotics via multiple didactic sessions. Appropriate prescribing criteria were printed and placed in folders for both physicians and nurses. Educational posters were posted in each patient room. After these interventions, encounters with a diagnosis of URI or sinusitis were audited in the EHR for appropriate use of antibiotics. Results: From October 2013 to January 2014, 24 patients were seen with a diagnosis of URI or sinusitis. Antibiotics were used inappropriately in 54% of cases. After our interventions, from October 2014 to January 2015, 56 patients were seen with URI or sinusitis. Antibiotics were given inappropriately in 25% of cases. This decrease was found to be statistically significant (p = 0.013). Conclusion: By devising an educational approach using guidelines from the Choosing Wisely Initiative, we were able to improve evidence-based prescribing habits and decrease inappropriate use of antibiotics for URI and sinusitis.

B11 Title: Characteristics and Risk Factors of Low Blood Zinc Levels among Adults of an Outpatient Clinic
Authors: Charles Ebersbacher (OMS II)1; Tzucheg Kao2; Li Yang1; Jen-Tzer Gau, MD, PhD1
Affiliations: 1Ohio University Heritage College of Osteopathic Medicine, Athens, Ohio; 2Uniformed Services University of the Health Sciences, Bethesda, Maryland

Background: Zinc (Zn) is an important micronutrient. Little information is available to identify clinical features and risk factors associated with lower blood Zn levels. The aim of this study was to characterize clinical features and determine risk factors associated with lower blood Zn levels. Methods: A retrospective case-control study was conducted on adults aged ≥50 in a clinic. Results: Cases (N=24) and controls (N=48) had mean Zn levels 0.58±0.06 and 0.78±0.11 μg/mL, respectively (p <0.001). Cases were more likely to have a history of infection in the past year (p=0.043), fracture (p=0.021), hip fracture (p=0.005), and anemia (p=0.01). Patients taking iron supplements (OR =5.0) and gastric acid suppressants (OR=2.80) also increased the odds of having lower Zn levels. Cases had significantly lower mean levels of serum calcium, albumin, percentage of lymphocytes, and hemoglobin (all p values <0.03). Multiple logistic regression model revealed that hip fractures in the past (adjusted OR or AOR=14.6 [1.35-412.35]), albumin level <3.5 g/dL (AOR=7.05[1.62-36.11]), and anemia (AOR=4.46 [1.13-19.17]) were independent risk factors for lower Zn levels after adjusting for age, gender, and BMI. Linear regression model revealed that hip fracture in the past (adjusted β=0.101), hypoalbuminemia (adjusted β=0.092), and anemia (adjusted β=0.068) were independently associated with lower blood Zn levels. Conclusion: Adults with lower blood Zn levels had a significantly higher percentage of infections and fractures in the past and lower blood albumin and hemoglobin levels. Hip fracture in the past, hypo-albuminemia, and anemia were independent risk factors associated with lower Zn levels.

B12 Title: Mechanisms of Hyperglycemia-Induced ROS Production in Osmotically Swollen Glial Cells
Authors: Augusta Eduafo (OMS II)1; James Olson, PhD2
Affiliations: 1Ohio University Heritage College of Osteopathic Medicine, Athens, Ohio; 2Wright State University, Dayton, Ohio

Introduction: Cerebral edema is a potentially fatal complication of diabetes. There is evidence for increased Reactive Oxidative Species (ROS) production during cerebral edema in diabetics. Hyperglycemia can cause an increase in ROS production due to activation of NADPH oxidases.

Objective: The purpose of this study is to determine if there is increased ROS production in swollen hypoxicemic cells and also to determine the mechanism by which this increased ROS production occurs.

Methods: C6 rat glioma cells were grown in normal glucose medium or were exposed to high glucose medium for 24 hours to simulate diabetic conditions. Cells were then perfused with isosmotic and hypoosmotic PBS and ROS production was measured for 30 minutes.

Results: There was no change in ROS production when cells grown in normal glucose (normoglycemic) medium were osmotically swollen. Cells grown in high glucose (hypercglycemic) medium had increased basal ROS production. These cells further increased their ROS production when osmotically swollen. Blocking Nox2 and Nox4 enzyme activity decreased basal ROS production of both normoglycemic and hyperglycemic cells. Blocking Nox2 and Nox4 also decreased ROS production of hyperglycemic cells during hypoosmotic exposure. Normoglycemic cells increased their production of ROS when osmotically swollen in the presence of Nox2 and Nox4 inhibitors. Normoglycemic cells did not increase their ROS production in hypoosmotic conditions. Hyperglycemic cells had increased ROS production in isoosmotic conditions. This increase in ROS production is even greater when hyperglycemic cells are swollen.

Conclusion: Hyperglycemia, a major risk factor of diabetes, increases ROS production but even more so when there is cellular edema.

B13 Title: Characterization of RyfA, a small RNA in Shigella flexneri
Authors: Francis Essien (OMS II); Erin Murphy, PhD; Megan Fris
Affiliation: Ohio University Heritage College of Osteopathic Medicine, Athens, Ohio

Introduction: Members of the genus Shigella (S. flexneri, S. dysenteriae, S. boydii and S. sonnei) are Gram-negative bacteria of the family Enterobacteriaceae and are the causative agents of shigellosis, a severe diarrheal disease in humans. Shigellosis remains a worldwide health concern with a conservative estimate of 160 million cases per year resulting in 1.5 million deaths. Shigella species have been proven to utilize small RNA (sRNA) molecules to control vital virulence-associated processes. The most recently characterized sRNA in Shigella is RyfA.

Hypothesis/Objective: The working hypothesis is that the single RyfA molecule produced by S. flexneri influences both eukaryotic cell invasion and cell-to-cell movement by this pathogen. The objective of the ongoing studies is to characterize the impact of S. flexneri RyfA on the virulence of this bacterial pathogen.

Methods: As a means to investigate the function of S. flexneri RyfA, a plasmid was constructed from which RyfA is produced at high levels. Preliminary results indicate that increased production of RyfA results in the formation of smaller plaques as compared to those formed by wild-type S. flexneri. Conclusion: These data support the conclusion that in the presence of increased levels of RyfA S. flexneri is able to invade eukaryotic cells but is unable to replicate and/or spread to neighboring cells. Experiments are ongoing to further characterize the role of RyfA in controlling S. flexneri virulence. Once these essential pathways are understood, directed efforts can be made to disrupt them, and by doing so reducing or eliminating the ability of the bacterium to instigate disease.
B14 Title: Channelopathy Contributes to Proprioceptive Deficits Following Chemotherapy
Authors: Obianuju Ezolisa (OMS I)1; JA Vincent, MD/PhD student1; KB Wieczerzak, MD2; P Nardelli1; MM Rich, PhD, MD2
Affiliations: 1Ohio University Heritage College of Osteopathic Medicine, Athens, Ohio; 2Wright State University, Dayton, Ohio
Our recent studies demonstrated neurotoxic effects of oxaliplatin included abnormalities in sensory encoding by muscle proprioceptors. For weeks following IP injection of oxaliplatin, IA afferents lost their firing during sustained muscle stretch, becoming rapidly adapting. We speculated that the loss of sustained firing was related to an effect of oxaliplatin on persistent inward currents (PICs) involved in either transduction or encoding. This idea is tested by examining the effects of pharmacologically blocking PICs in terminal experiments performed on anesthetized normal adult rats; injecting riluzole or phenytoin, post sampling control afferents. These agents reproduced previously described deficits in sensory encoding following treatment with oxaliplatin; firing during the hold phase of stretch was significantly shortened, with AP during ramp phase and vibration unaltered- suggesting oxaliplatin neurotoxicity targets specific channels and encoding. Separately, we examine motor behaviors expected to be altered by the impairment described above for proprioceptors. Rats were treated with oxaliplatin and several weeks following cessation of treatment a variety of measures were made to assess the systemic effects together with the animal’s ability to walk on a balance beam. Declines in tail SNAPs (sensory nerve action potentials) and lack of response to distal tail pinch indicated neuropathy. Whereas untreated rats exhibited virtually 100% success in hindlimb placement on the balance beam, oxaliplatin treated rats slipped during 50%, a disability not explained by loss of touch sensation. Further research has important implications for understanding and possibly treating the persistent proprioceptive dysfunction experienced by patients on oxaliplatin.

B15 Title: Heart-Rate Variability Does Not Appear To Mediate Childhood Adversity’s Effect on Adult Obesity
Authors: Anne Farbman (OMS/PhD); Gillian Ice, PhD
Affiliation: Ohio University Heritage College of Osteopathic Medicine, Athens, Ohio
Introduction: The “Sensitivity to Context” theory proposes that a cardiovascular stress response that is more rapid and robust may be a plastic, adaptive response to an uncertain or unstable environment, despite a long-term cost to metabolic health. Individuals raised in a stressful setting may display a stronger adrenergic response to a given mild-to-moderate stressor, but show earlier and more severe symptoms of diseases such as obesity, diabetes, or hypertension. Evidence linking standardized recall assessments of childhood stress, such as the Adverse Childhood Experiences score (ACE) to obesity in adulthood have been considered to support this hypothesis. Measures of stress response, such as decreased heart-rate variability (HRV) in individuals with metabolic disease, have been explored as mediators. Objectives: Using preliminary data from a study of developmental antecedent of the stress response in Appalachian women, we investigated whether stress response acted as a mediator connecting childhood adversity to adult health. Methods: We exposed women between the ages of 40 and 55 to a stressful computer task and a sudden noise while wearing a heart monitor. The transcript was assessed for HRV, and BMI was also measured. Results: BMI correlates with both HRV startle response (to a sudden noise) \( r = 0.41 \) \( p < 0.01 \) and ACE score \( r = 0.48 \) \( p < 0.01 \) but the two factors are almost completely uncorrelated with each other \( r(0.01) = 0.69 \). Summary: Although prior relationships were supported by this research, HRV-assessed stress response is less likely to be a simple mediator linking ACE in childhood to BMI in adulthood.

B16 Title: Ultrasonic Percutaneous Tenotomy of Common Extensor Tendons for Recalcitrant Lateral Epicondylitis
Authors: Michael Fisher, DO (PGY 2)1; Matthew P Noyes, MD2; Christopher Battista, MD2; Jedediah H May, MD2
Affiliations: 1Western Reserve Hospital, Cuyahoga Falls, Ohio; 2Wright State University, Dayton, Ohio
Introduction: Tendinopathy of the common extensor origin of the elbow is a common musculoskeletal condition encountered by many orthopedic surgeons. A small percentage of refractory cases may necessitate surgical intervention for relief of symptoms. Objectives: A new treatment system has been developed that utilizes ultrasound-guided ultrasonic microsection of tendinopathic tissue. The authors of this prospective case series describe the continued clinical improvements in pain and function scores and lack of complications of this system over a one-year period for the treatment of lateral elbow tendinopathy. Methodology: Prospective case series over a 5 month period of time. Seven patients were identified having symptoms of lateral epicondylitis for greater than 6 months having failed conservative treatment. The patients were followed for 12 months and Visual Analog Scores and ASES were compared using paired t test to assess change. Results: In the follow up period 6 of the 7 patients had statistical significant improvement of ASES scores and VAS scores following the procedure. The patient who did not improve elected to undergo open debridement of the lateral epicondyle during the follow up period. Conclusion: Ultrasound guided percutaneous ultrasonic tenotomy appears to be a safe, effective, and well-tolerated procedure.
B18 Title: Right Ventricular Performance in Neonates with Bronchopulmonary Dysplasia
Authors: Disha Haque (OMS I); Corey Stiver, MD; Brian K. Rivera, MS; Bernadette Richards, RDCS, FASE; Nina Ma, BA; Charles V. Smith, PhD; Clifford L. Cua, MD; Carl H. Backes, MD
Affiliations: 1Ohio University Heritage College of Osteopathic Medicine, Athens, Ohio; 2Nationwide Children’s Hospital, Columbus, Ohio; 3The Ohio State University College of Medicine, Columbus, Ohio; 4Seattle Children’s Hospital, Seattle, Washington

Introduction: Bronchopulmonary dysplasia (BPD) is associated with pulmonary hypertension (PH). The majority of deaths in BPD neonates are linked to PH and right ventricular (RV) dysfunction. Traditional echocardiographic measures of RV performance are limited by its structure, but myocardial deformation imaging (MDI) directly views the myocardium. Application of MDI in BPD neonates has not been explored. Objectives: Test the hypothesis that MDI provides sensitive estimates of RV function correlating with BPD severity. Methodology: 34 patients (11 control, 13 moderate BPD, and 10 severe BPD) underwent echocardiograms with traditional imaging (M-Mode, mitral/tricuspid inflow velocities) and myocardial deformation imaging (global systolic strain/strain rate, standard deviation time to peak longitudinal strain). BPD severity was scored using the NICHD/NHLBI rating scale by physicians blinded to results. Groups were compared using one-way ANOVA with post-hoc testing.

Results: The average gestational age (GA) of the cohort was 27.0 ± 3.4 wks, with corrected GA of 44.2 ± 16.2 wks. Average GA, corrected GA, and weights were similar between groups. Global longitudinal strain was lower in severe BPD patients (-19.2% ± 6.1%) than in moderate (-24.3% ± 1.9%) or normal/mild (-23.4% ± 4.1%) forms of BPD (P =0.04). Standard deviation of time to peak longitudinal strain, was higher in severe (55.4 ± 24.4 msec) than in moderate (21.4 ± 24.4 msec) or normal/mild (15.8 ± 15.6 msec) BPD patients (P=0.01). Conclusions: Differences in deformation analysis were observed correlating with BPD severity. Such differences may provide markers for PH screening and for evaluating therapeutic effectiveness.

B19 Title: Adolescent Femoroacetabular Impingement (FAI): Gender Differences in Hip Morphology
Authors: Perry Hooper, DO (PGY 3); Sameer Oak, MS; Gehan Ibrahim, MD; T. Sean Lynch, MD; Ryan Goodwin, MD; James Rosneck, MD
Affiliations: 1Cleveland Clinic Foundation/South Pointe Hospital, Cleveland, Ohio; 2Cleveland Clinic Lerner School of Medicine, Cleveland, Ohio; 3The Ohio State University Department of Radiology, Columbus, Ohio; 4Columbia University Medical Center/New York-Presbyterian Hospital, New York, New York; 5Cleveland Clinic Pediatric and Scoliosis Surgery, Cleveland, Ohio; 6Cleveland Clinic Sports Health, Cleveland, Ohio

Purpose: Using preoperative radiographs and intraoperative findings for adolescents whose FAI was treated with hip arthroscopy, we compared the hip morphologies of males and females to determine whether results differed by gender. Methods: We retrospectively reviewed the records of 177 adolescents, 13 to 18 years of age, who were treated for FAI with hip arthroscopy. We examined and analyzed preoperative MRI and plain radiographs, measuring lateral center edge angle, Tonnis angle, and alpha angle and then compared these measurements with intraoperative findings. The intraclass correlation coefficient between readers was calculated. We created multiple linear regression models incorporating age, gender and BMI with the radiographic measurements as outcomes to evaluate differences while controlling for other variables. Intraoperative findings utilizing the Outerbridge grading system and procedure performed were documented. We compared these findings with our preoperative imaging measurements using the Wilcoxon rank-sum test when appropriate. Results: The intraclass correlation coefficient demonstrated moderate to strong agreement between the three image readers. The BMI and age adjusted mean alpha angle was higher in males than females on both plain radiograph (55.9° versus 45.2°; p = 0.0001) and MRI (54.1° versus 42.5°; p < 0.0001). 38.9% of males demonstrated an alpha angle of > 55° compared to only 1% of females (p=0.0001). The lateral center edge angle and Tonnis angle on MRI and plain radiograph displayed no statistically significant differences between genders after controlling for BMI and age. Males were more likely to have chondral damage intraoperatively (56.3% versus 32.5%; p=0.0041) with no differences seen in labral pathology. Conclusions: We found sex-dependent characteristic differences in adolescents who have undergone hip arthroscopy for FAI. Males presented more radiographic cam-type deformities preoperatively and more chondral injury intraoperatively.

B20 Title: Dual External Direct Cardioversions Using Two Synchronized 360J Shocks for Morbidly Obese Patients in Atrial Fibrillation
Authors: Hoda Illas, DO (PGY 1); Michael Reinig DO, FACC
Affiliations: Fairfield Medical Center, Lancaster, Ohio

Introduction: Standard transthoracic external cardioversion fails in converting atrial fibrillation into sinus rhythm in 5 to 30% of patients. Increased body mass index and trans-thoracic impedance are two variables that correlate with unsuccessful cardioversions. If direct current cardioversion attempts fail, patients are referred for internal cardioversion, an invasive procedure. Using two standard defibrillators, we assessed the success and safety of using two synchronized direct current cardioversions at max output (360 J x 2 for a total of 720 J). Methods: All patients underwent at least two attempts at conventional external transthoracic cardioversion with paddles in an anteroposterolateral position, applying energies up to 360 J without success. Patients with BMI over 35 and failed medical management underwent standard transthoracic external cardioversion with 720 J. Two external defibrillators with patches in the anterior-posterior positions delivered two simultaneous 360 J shocks. Results: Over a 12 month consecutive period, 11 patients with a BMI>35 and at least two unsuccessful cardioversions at 360 J were referred for attempted 720J cardioversion. The range of BMI varied from 35.8 to 58, with an average BMI of 49.1. Of those 11 patients, nine were successfully cardioverted to sinus rhythm. Mean BMI for the successful group was 50.3; unsuccessful group was lower at 43.9. There were no complications. Conclusion: High energy 720J transthoracic external cardioversion is a safe, effective technique for cardioversion over standard cardioversion with 360J for morbidly obese patients in atrial fibrillation. This technique may prevent an invasive internal cardioversion procedure and transfer to a tertiary facility.
April 23, 2016

**B21**

**Title:** What Patients Think: A Prospective Survey of Patients’ Participating in Clinical Trials  
**Authors:** Brittany Kasturiarachchi (OMS II); Nashat Gabrail, MD; Carrie Smith, RN; T. Abberton; J. Rigg; R. Rosia; L. Zerner; K. Akrom  
**Affiliations:** 1Ohio University Heritage College of Osteopathic Medicine, Athens, Ohio; 2Gabrail Cancer Center, Canton, Ohio  

The object of this study was to determine the opinions of clinical trial patients at the Gabrail Cancer Center (GCC) with respect to their experiences during their trial. The GCC serves a variety of patients and cancer diagnoses in the Northeast Ohio area. The data from this study will be used to improve the clinical trial process and educate other oncology practices about providing trials, as only 2% of cancer patients in the U.S. are enrolled in clinical trials. This is a 5-year ongoing survey, with 258 patients that have participated to date. 27 questions were asked to patients about their trial experience, 10 of which were dedicated specifically to the consent form process. Patient interviews were conducted face-to-face confidentially. The results of the study showed many trends in the clinical trial process at the GCC. For example, 41% had few fears before entering trials and often were not afraid to try another trial if a previous trial was unsuccessful. In addition, a nearly 18% joined to help research. This indicated that patients understood the purpose of clinical trials existing to improve future cancer treatment. The consent form data showed that because patients had a healthcare professional walk them through the form, there were few issues with patients understanding medical jargon and expected side effects. Overall, the study showed the preferences and sentiments of patients at the GCC. As the study continues, the questions will be altered to reflect changes to the trial education process in the future and more specific patient population data.

**B22**

**Title:** Gender Differences in DSM-5 PTSD Prevalence and Symptomatology Largely Explained by Sexual Trauma  
**Authors:** Kevin Kawalcz (MS IV); Jeff Guina, MD, Capt, USAF, MC; Ramzi Nahhas, PhD, BS; Seth Farnsworth, MD, Capt, USAF, MC  
**Affiliations:** 1Wright State University Boonshoft School of Medicine, Dayton, Ohio; 2Wright Patterson Air Force Base, Dayton, Ohio; 3Misawa Air Force Base, Japan  

Hypothesizing that trauma differences explain many gender differences in symptomatology, this is the first known study to adjust PTSS (post-traumatic stress symptoms) for trauma type, and to compare the differences between male and female responses to sexual traumas. Using a cross-sectional self-report survey methodology, we examined gender, trauma type, PTSSs, suicide, alcohol and tobacco. Among those with trauma, women had worse severity of most outcomes than men, but after adjusting for trauma type, only a certain set of PTSS was worse than men. Among those with PTSD, there were no significant PTSS gender differences. Though women had significantly higher PTSD rates than men even after adjusting for non-sexual traumas only, the difference became non-significant after also adjusting for sexual traumas. Within each gender, those with sexual trauma had worse outcomes compared to non-sexual trauma. Men with sexual trauma had more recklessness and tobacco; women had more suicide attempts and avoidance. When isolating the effects of sexual trauma beyond other traumas, there were no significant outcome difference-in-differences between genders. In this clinical sample, higher PTSD rates and worse mood/cognitive symptoms among women were partially explained by trauma type, but independent of trauma type for trauma-cue reactivity and avoidance. The lack of PTSS gender differences within the PTSD subset suggests that, while PTSD is more prevalent among women, when men do develop PTSD, they present similarly. This suggests that, while women have higher rates of sexual trauma, both have similarly severe responses. Most gender differences in PTSD presentation appear to be explained by trauma type differences, particularly women having higher rates of sexual trauma. We discuss potential biopsychosocial explanations of our results.

**B23**

**Title:** The Use of Fine Needle Aspiration in Workup of Thyroid Malignancies at a Tertiary Care Teaching Hospital in 2014  
**Authors:** Christopher R. Kieliszak, DO (PGY 3); Ruth Anker, DO; Richard Klapchar, DO  
**Affiliation:** OhioHealth/Doctors Hospital, Columbus, Ohio  

**Introduction:** Fine needle aspiration (FNA) is a surgical procedure that can be used to evaluate thyroid masses and diagnose thyroid malignancies. Objectives: Identify how regularly Fine Needle Aspiration (FNA) is being performed before malignant thyroid neoplasms are operated on at a single tertiary care teaching hospital in the year 2014. **Methodology:** The 15 total biopsy proven cases of thyroid malignancy were further reviewed and statistics were tabulated documenting the use of FNA and preoperative ultrasound. Data was tabulated, and compared to national guidelines. **Results:** 1. There were a total of 15 thyroidectomies performed at Doctor’s Hospital in 2014; 2. FNA was performed before 8 of the 15 thyroidectomies (53.3%); 3. Among the 12 unique patients, 7 patients had underwent a thyroidectomy in which an FNA was performed; 4. Overall, a pre-operative ultrasound was performed for 12 of the 15 thyroidectomies (80.0%), not performed for 2 (13.3%), and unknown for 1 (6.7%); 5. Among thyroidectomies in which FNA was not performed (n=7), a subset was completion thyroidectomies for pathology proven cancer (n=2). Of the remaining cases (n=5), the average nodule size was 4.3 CM in maximum diameter. There were neither simple cysts, nor suspicious cervical lymph nodes. **Summary/Conclusion:** Among thyroidectomies in which FNA was not performed (n=7), FNA should have occurred for 5 thyroidectomies based established guidelines, resulting in an area for improvement for all five. Preoperative sonographic features should routinely be utilized in order to guide thresholds for FNA.
B24 Title: Association between Method of Delivery and Exclusive Breastfeeding at Hospital Discharge  
Authors: David Kling (OMS II); Zelalem T. Haile, PhD, MPH; John Francescon (OMS II); Ilana R.A. Chertok, PhD, MSN, RN, IBCLC  
Affiliations: 1Ohio University Heritage College of Osteopathic Medicine, Athens, Ohio; 2University of North Carolina at Charlotte School of Nursing, Charlotte, North Carolina

Introduction: The current recommendation is mothers to exclusively breastfeed for the first six months of life. Method of delivery (MOD) has been identified as a barrier that may hinder breastfeeding practices. However, research examining the association between MOD and exclusive breastfeeding at hospital discharge in lacking.  
Objective: To examine the association between method of delivery and exclusive breastfeeding at hospital discharge.  
Methods: A cross-sectional analysis including 1,494 women who participated in the population-based Infant Feeding Practices Study II conducted by the CDC. The main outcome of interest was exclusive breastfeeding at hospital discharge. Logistic regressions were utilized to estimate the odds ratio (OR) and the 95% confidence interval (CI) of the association between MOD and exclusive breastfeeding at hospital discharge.  
Results: The crude prevalence of vaginal delivery and cesarean section was 74.8% and 25.2%, respectively. The prevalence of exclusive breastfeeding at hospital discharge was 70.6% among women who gave birth by cesarean section and 80.0% of women who gave birth vaginally (p = 0.001). After adjusting for confounding factors, the odds of exclusive breastfeeding at hospital discharge were lower among women who gave birth by cesarean section compared to women who gave birth vaginally (OR: 0.41; 95% CI 0.24 – 0.71).  
Conclusion: Women who give birth by cesarean may require additional attention and training during their stay in the hospital to improve rates of exclusively breastfeeding at discharge. It is important that healthcare providers address MOD when educating patients on exclusively breastfeeding in order to maximize the potential for longer-term breastfeeding success.

B25 Title: Efficacy of Condylar Decompression and Tongue Inhibition in Improving Lactation Dysfunction in Neonates  
Authors: Joanna Kramer, DO MPH (PGY 3); Iris Castillo, DO; Amy Vagedes, DO; Carl Backes, DO; Kimberly Wolf, DO  
Affiliation: Nationwide Children’s Hospital, Columbus, Ohio

Introduction: Successful breast feeding latch in a newborn requires the coordination of cranial nerves and oro-facial musculature. The normal birthing process can disrupt sutures in the newborn skull, causing cranial nerve compression and somatic dysfunction. The primary objective of this study is to determine if Osteopathic Manipulative Treatment (OMT) is beneficial in improving latch in breastfed newborns by addressing somatic dysfunction.  
Methodology: Term healthy infants were assessed by trained lactation consultant nurses within 24 hours of birth and assigned a standardized LATCH score. Any infant with a LATCH score < 5 (scale of 1-10) was considered for study inclusion. Infants whose parents consented to the study were randomized into one of three groups: OMT, sham treatment, and lactation consultation only. Infants in the OMT group received occipital condylar decompression and tongue inhibition by physicians who were trained in the standardized mode of treatment; those in the sham group were removed from the room but did not receive any hands-on treatment. All infants received lactation consultation, the standard of care. A post-treatment LATCH score was then assigned and compared to the pre-treatment LATCH score. Treatment groups were blinded to the parent and the lactation consultant. Results: Study still in progress, however, early success has been observed with improvement in LATCH scores for patients treated with OMT compared to those who received sham treatment or lactation consult only.  
Summary/Conclusion: OMT is a potentially beneficial treatment in addition to standard of care for infants with latching dysfunction due to somatic dysfunction.

B26 Title: Utilization of eICU Telemedicine Carts in the Emergency Department  
Authors: Shana M. Machado, DO (PGY 3); Erika H. Wilson, DO; John O. Elliot, MPH; Kim Jordan, MD  
Affiliation: OhioHealth/Riverside Methodist Hospital, Columbus, Ohio

Introduction: In the US, approximately 1 million cases of severe sepsis occur annually with 215,000 deaths. The 2010 Surviving Sepsis Campaign (SSC) recommended “sepsis bundles” for diagnosis and treatment of septic patients presenting to the Emergency Department (ED). Electronic intensive care unit (eICU) telemedicine programs have been used in the ED to improve bundle implementation, but few studies have evaluated outcomes.  
Objectives: To assess if ED eICU cart activation improves compliance with “sepsis bundles” and impacts length of stay (LOS), disposition and costs.  
Methods: An IRB-approved retrospective cohort study was completed on sepsis patients who presented to the ED from July 2010-August 2013. Data (eICU cart activation, timing of blood cultures, lactic acid level, antibiotic and fluid administration) was analyzed via chi-square tests, independent samples t-tests and Wilcoxon rank sum tests.  
Results: Of 821 encounters, 364 cases met inclusion criteria (103 exposed, 261 not exposed). The eICU-exposed cohort were more likely to receive antibiotics within 3 hours (83.5% vs. 71.6%, p = 0.039) and have lactic acid levels drawn within 6 hours (98.1% vs. 90%, p = 0.034). Hospital LOS, disposition and death were similar between cohorts, but eICU exposure was associated with shorter ED stay, 0.08 days ± 0.27 versus 0.16 ± 0.7, p = 0.031. Cost differences did not reach statistical significance: exposed $19982 ± 16620 vs. not exposed $24084 ± 23955, p = 0.209.  
Conclusions: ED exposure to a telemedicine-based eICU cart impacted adherence to 2010 SSC sepsis bundles, but not overall LOS, survival, or medical costs.

B27 Title: Midshaft Clavicle Fractures with Associated Ipsilateral Acromioclavicular Joint Dislocations: Incidence & Risk Factors  
Authors: Lara Martinez (OMS II); Benjamin C Taylor, DO; Christina Ottomeyer, DO; Michael P Ebaugh, DO; Mark J. Isaacson, DO  
Affiliations: 1Ohio University Heritage College of Osteopathic Medicine, Athens, Ohio; 2OhioHealth/Grant Medical Center, Columbus, Ohio; 3OhioHealth/Doctors Hospital, Columbus, Ohio

Introduction: Concurrent injuries to both the clavicle and acromioclavicular (AC) joint have been studied and reported, but only in reference to distal clavicle fractures.  
Objective: It was our objective to determine the incidence of midshaft clavicle fractures combined with ipsilateral AC joint dislocations, and assess risk factors for the dual injury pattern.  
Methods: This was a retrospective review of a collected database, looking at 383 adult patients without previous shoulder girdle injury or trauma who sustained a displaced diaphyseal clavicle fracture. All patients in the study underwent either nonoperative management or surgical reduction and stabilization of a diaphyseal clavicle fracture with a plate and screw construct. Study subjects were followed with serial radiographs of the ipsilateral clavicle and acromioclavicular joint to assess for acromioclavicular joint injury. Additional data on concurrent injuries was also collected.  
Results: We found that 13/183 (7.1%) of patients undergoing fixation of a diaphyseal clavicle fracture had an ipsilateral AC joint injury, while 13/200 (6.5%) of patients undergoing conservative management had an ipsilateral AC joint injury. Critical analysis of the data revealed that only superior plateauing in operative cases and presence of ipsilateral scapular body fractures were associated with an increased rate of this injury pattern.  
Conclusions: This injury pattern is much more common than traditionally believed, with an incidence of 6.8% overall. We hope that our findings can help guide orthopaedic surgeons to become more aware of this injury pattern, and assess for this association on all midshaft clavicle fractures, as it may be influential to the management of the patient.
B28  Title: What's the HARM: Implementing the HARM Score in a Community Hospital Setting
Authors: Roxanne McMillan, DO (PGY 3); Godwin Dogbey, PhD
Affiliations: Western Reserve Hospital, Cuyahoga Falls, Ohio; Ohio University Heritage College of Osteopathic Medicine, Athens, Ohio
Introduction: In the June 2014, Annals of Surgery, the Hospital Readmission and Mortality (HARM) Score was described as a new calculated score that would be able to summarize length of stay, mortality, and 30 day readmission. Objective: To calculate the HARM score for colorectal cases in the year 2015 using a volume of patients in a community hospital and determine if there exists a correlation between HARM Score and length of stay (LOS). Methodology: Colorectal cases were compiled and classified as either elective or emergent and examined for statistical difference in HARM score. The HARM score was created for both elective and emergent cases then correlated with LOS using Person correlation coefficient, while differences with respect to discharge status and 30-day readmission were analyzed using the independent sample t-test. Results: A total of 30 colorectal cases were examined with 47% elective and 53% emergent. The mean HARM scores for elective cases were 1.14 (±1.4 sd) and 2.25 (±2.5 sd). A statistically significant positive correlation (r = .739, p < .0001) was found between LOS and HARM score. Also, patients with alive discharge status had a lower mean score 1.45 (±1.4 sd) that the one dead 10 (±0 sd), p < .0001. No statistically significant differences (p > .05) were observed in the HARM scores and emergent cases and with regard to 30-day readmission status. Conclusions: The HARM SCORE was easy to implement and use for making comparisons of quality metrics at the hospital; with positive correlations with established quality metrics.

B29  Title: The Association between Obesity, Happiness and Quality of Life among Older Adults in South Africa and Ghana
Authors: Sophia Mort (OMS II); Gillian Ice, PhD; Zelalem Haile, PhD
Affiliation: Ohio University Heritage College of Osteopathic Medicine Department of Social Medicine, Athens, Ohio
Introduction: Obesity is a worldwide concern because of its relationship with chronic disease. In the United States, obesity is generally an ailment of the poor. Coupled with higher costs for physical and mental healthcare, obesity has a negative relationship with one’s quality of life (QOL). In developing countries, the relationship between socioeconomic class and obesity is typically reversed; obesity is linked with high self-reported health. The relationship between happiness and obesity has been studied in Malaysia, demonstrating that individuals believe they are healthy even though their weight indicates otherwise. Many African nations still have growing economies and others are transitioning from "developing" to "developed". The WHO Study on global AGing and Adult Health (SAGE) allows for the examination of obesity and its relationship with multiple factors that determine QOL. Objective: In this paper, we examine the association between obesity, happiness and QOL in Ghana and South Africa (SA). Results: 4,724 participants (age = 64.2±10.7) from Ghana and 3,840 (age = 62.7±9.7) from South Africa participated in Wave 1 surveys. 25.8% of participants from Ghana and 60.4% from SA were overweight or obese. In both Ghana and SA, there is a positive relationship between Body Mass Index (BMI), happiness (Ghana: p<0.001, SA: p<0.05), and satisfaction with one’s health (Ghana: p<0.001, SA: p<0.001). Conclusion: Higher QOL is associated with higher BMI in Ghana (p<0.001). SA data appeared to follow this trend, but yielded insignificant results. These results support previous research in developing nations where obesity is associated with happiness and good health.

B30  Title: Body Weight Perceptions as Influenced by Cultural Background: A Descriptive Study
Authors: Sesha Nandyal (OMS II); Robin Devine, DO; Kathy Dodd, MD
Affiliations: Ohio University Heritage College of Osteopathic Medicine, Athens, Ohio; OhioHealth/Grant Medical Center, Department of Family Medicine, Columbus, Ohio
Introduction: With a third of U.S. adults being obese in 2010 and the rates of obesity-related diseases affecting African American and Hispanic populations disproportionately, we hypothesized that bodyweight misperception across cultures may influence one’s willingness to lose weight. Objective: The aims of the study were 1) to compare the rates of correct self-identification as obese or overweight versus the calculated BMI, 2) compare patient reported perceived and ideal Stunkard Figure Rating Scale (SFRS) scores with their corresponding BMI ranges with actual BMI, 3) compare the differences between patient-perceived physician discussions regarding dietary habits, physical activity and/or weight loss with actual discussions via chart review, and 4) to describe the racial and ethnic differences in the level of readiness to change. Methods: This study, implemented in the East Main (EM) and Grove City (GC) clinics of Grant Family Practice, consented patients age 18+ with a BMI of 25-39, not pregnant or postpartum (±6 months), without eating disorders, and without a history of bariatric surgery preliminary results showed a majority of patients reporting never having had a discussion with their doctors about losing weight as well as 21% having a BMI over 40 at EM, and 20% of patients at GC reporting that their bodyweight was ideal or that the ideal bodyweight was larger than their current size (mean BMI: 31.9). Results/Conclusion: Pending final results and analysis of the 800-1000 surveys, the results will potentially support the development of culturally-sensitive patient education materials at Grant Medical Center and this could improve outcomes in obesity-related disorders.

B31  Title: Implementing Cadaver-Based Lab into Pre-Clinical Curriculum to Improve Procedural Techniques - A Pilot Study
Authors: Kruti Patel, DO (PGY 1)
Affiliation: OhioHealth/Doctors Hospital, Columbus, Ohio
Introduction: Central line is an intravascular catheter that is inserted into great vessel and terminates near the heart. > 5 million central venous catheters are inserted in the United States each year (8% of hospitalized patients). Large numbers of ICU patients require at least one form of indwelling vascular catheter; either for resuscitation with fluid or vasopressors, feeding or hemodialysis. Practical application of learning normal and abnormal anatomy in context of catheter placement is imperative to master. Objective: How to effectively incorporate teaching of CVC placement in pre-clinical years? Methods: The skill lab utilized several teaching modalities including didactic lecture, video presentation, cadaver based anatomy review, hands on practice with ultrasound on mannequins. The lab involved placement of Internal Jugular CVC. Pre and post questionnaires were obtained to assess knowledge of anatomy, comfort with technique, and quality of learning experience. The questionnaire allowed students to report their self –assessment on a five point Likert scale. Results: 19, 1st and 2nd year medical students volunteered to complete lab and evaluation. The students reported a mean (standard deviation) increased in anatomical knowledge of IJ CVC (p<0.001), mean (standard deviation) increased in comfort with techniques (p<0.001), and mean (standard deviation) increased in quality of learning experience (p<0.001). Conclusion: This lab was found to be a successful approach for reviewing pertinent anatomy and to introduce procedures and skills integral to residency. Combination of different learning modalities helped introduce and reinforce procedural skills and anatomical knowledge involved in CVC placement. Data gathered supports the purpose of this study (a pre-pilot study) to establish value of including cadaver to improve medical student self-reported understanding of IVC CVC placement.
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<th>Title</th>
<th>Fecal Distribution and Retention Patterns in Hospitalized Adults with Clinical Constipation Assessed by Abdominal X-Ray: A Case-Control Study</th>
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<tr>
<td>Authors</td>
<td>Parth Patel (OMS II); Steve Walston, DO; Michael Finamore, DO; Victor Heh, PhD; Tzu-Che Kao, PhD; Jen-Jung Pan, MD, PhD; Jen-Tzer Gau, MD, PhD</td>
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<tr>
<td>Affiliations</td>
<td>1Ohio University Heritage College of Osteopathic Medicine, Athens, Ohio; 2OhioHealth/Riverside Methodist Hospital, Heart and Vascular Physicians, Columbus, Ohio</td>
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Introduction: Abdominal radiography (AR) has been used as a supplemental diagnostic tool to assess the severity of stool retention (SR). Little information is available on the patterns of SR among adult patients with constipation. Objectives: To investigate SR distribution patterns and identify risk factors associated with different patterns. Methodology: A retrospective case-control study was performed consisting of 122 patients ≥65 years old admitted to a hospital with discharge diagnosis of constipation without bowel obstruction and also had AR during the stay. Each colonic quadrant (ascending, transverse, descending, and recto-sigmoid) was scored using the AR for severity of SR (5 being the most severe). Patients with total scores ≥13 were designated as “Clinical Constipation” (N=71) and ≤12 as “Control” (N=39). Quadrant scores ≥3.5 were designated as high-scores and <3.5 as low-scores. Logistic regression was performed to identify associated risk factors. Results: The Clinical Constipation group had significantly higher scores in all four quadrants compared to the Control with the greatest difference in the right-colon. Conclusions: Our study revealed that ascending colon has the greatest difference in the mean quadrant score among the four parts of colon between clinically constipated patients and controls. Antibiotic use was associated with lower odds of having predominant R-Colon SR. Further studies are needed to explore the implications of SR patterns among constipated patients.

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<th>Title</th>
<th>Implications of ICU-Based or Operation Room-Based Tracheostomy</th>
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<tr>
<td>Authors</td>
<td>Nicholas Pettit (OMS IV); M. Shay O’Mara, MD</td>
</tr>
<tr>
<td>Affiliations</td>
<td>1Ohio University Heritage College of Osteopathic Medicine, Athens, Ohio; 2OhioHealth/Grant Medical Center, Columbus, Ohio</td>
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Introduction: Pericutaneous bedside tracheostomy is thought to be a safer and cheaper alternative compared to the open surgical tracheostomy. Objectives: We hypothesized that patients who underwent the percutaneous bedside tracheostomy would have better outcomes compared to the open surgical tracheostomy. Methodology: 571 patients who underwent either the percutaneous bedside tracheostomy or the open surgical tracheostomy were included in this study, and evaluated retrospectively. Outcomes were post-operative complication and in-hospital mortality. Results: Any post-operative complication was evaluated and was determined that the tracheostomy group (ICU vs OR, p = 0.011) and admitting service (medicine versus trauma, p = 0.017) were significant predictors of this outcome. Medical patients were 2.3 times more likely to have any post-operative complication. The rate of complications for the percutaneous bedside tracheostomy was 19% (16/84), and is significantly higher than either the open surgical technique (8.7%, 36/414, p = 0.005) or the percutaneous technique performed in the OR (7.4%, 6/81, p = 0.028). When isolating the patients by service, medicine versus trauma, the percutaneous procedures done at bedside had almost double the complication rate as compared to those procedures performed in the OR (perc-ICU medicine 29% complication rate versus OR medicine 14.8%; perc-ICU trauma 12.5% versus OR trauma 5.8%). Lastly, only age was a significant predictor of mortality (p < 0.0001). Conclusions: We discovered that percutaneous tracheostomies have double the rate of complications as compared to the open surgical tracheostomy, which will allow for the development of a formalized protocol for these procedures.

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<th>Title</th>
<th>20 Year Experience of Abdominal Aortic Aneurysm Endograft Procedures at a Tertiary Care Community Hospital</th>
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<tr>
<td>Authors</td>
<td>Eric Phillips (OMS II); Mitchell Silver, DO FACC FABVM</td>
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<td>Affiliations</td>
<td>1Ohio University Heritage College of Osteopathic Medicine, Athens, Ohio; 2OhioHealth/Riverside Methodist Hospital, Heart and Vascular Physicians, Columbus, Ohio</td>
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Introduction: Endovascular aneurysm repair (EVAR) has provided a less invasive option to open surgery for abdominal aortic aneurysm (AAA) treatment. Contrasting to all of the benefits of EVAR, endoleaks has been the overarching complication. Defined as persistent blood flow between aneurysm and systemic circulation, endoleaks pose a risk of rupture, infections, and other complications after EVAR. Objectives: Analyze and share outcomes after EVAR in a real world 20-year experience from a tertiary care community hospital. Objectives were to determine prevalence of endoleaks, describe clinical outcomes following endoleak treatment, including rates of complications, revisions, and mortality, by type of stent device use and type of endoleak. Methodology: Retrospective single center observational registry from 1995-2015. Results were reported using means and standard deviations for continuous variables and frequencies and percentages for categorical variables. Outcomes of patients by variables of interest were compared using chi-squared tests. Statistical significance was set at p<0.05. Results: 14% of patients developed an endoleak post EVAR, Type 2 endoleak most common, 48.1% had treatment success, no difference in stent devices and outcome. 36.5% needed reintervention, no difference in need for additional treatment or any difference in mortality for patients who were or were not on beta blocker. Summary/Conclusion: Factors influencing results were our robust clinical follow-up of all patients receiving an endograft from the dedicated staff to make sure surveillance done on everyone. A “multi-disciplinary” approach with cardiology and cardiovascular surgery on every case done could have related to increase in successful outcomes.
Objectives: Reducing hospital readmissions is a priority in medicine, motivated by both quality standards and financial incentives. Interventions to reduce readmissions target patients at greatest risk for readmission. However, studies show that clinicians have poor ability to subjectively discriminate between patients at risk for readmission. Subsequently, several tools have been developed to quantitatively assess risk of readmission. The LACE Index and HOSPITAL score can both be used to quantitatively assess the risk of readmission; however, both scores have not been validated in specific populations. There are currently very few studies investigating integration of readmission risk assessment at the graduate medical education level. Objectives: This study compares use of LACE and HOSPITAL criteria for ability to predict risk of readmission in patients within a Resident-based Family Practice Center. Methodology: This study is a retrospective chart review of adult patients admitted by a Residency-based Family Practice, during the months of June, 2015 to January, 2016. The LACE and the HOSPITAL scores will be calculated for each patient. Validation of the scores using actual rates of 30-, 60-, and 90-day readmissions will be performed. Data will be reported as median or proportions (95% confidence interval). Differences between groups will be tested using Chi-square test or Wilcoxon rank-sum test. Results, Summary and Conclusions: Research in progress; Results and conclusions will be presented at the Ohio Osteopathic Symposium Poster Exhibition. Results will be used to implement new practices and educate residents to better identify patients at risk for readmission for targeted interventions.

Hypothesis: We hypothesized that specific discharge information would be easier to find on redesigned, patient-focused discharge instructions compared to the current format. Methodology: An IRB-approved survey was administered to English-speaking patients, 18 or older, who provided consent. Patients answered questions using a 5-point Likert scale (0="Cannot find" to 4="Very easy to find," score range 0-16) on ease of finding: whom to call with post-discharge questions, follow-up instructions, medication instructions and reasons for taking medications. Follow up questions asked patients to verbally identify dosage and reasons for medications and to identify their preferred version of discharge instructions. Data was analyzed using descriptive statistics, paired t-tests, Wilcoxon signed rank tests and 95% confidence intervals. Results: Twenty patients were enrolled. Overall evaluation scores revealed preference for the redesigned format over the standard discharge summary: 14.6 (95%CI:13.8-15.3) vs 10.0 (95%CI:8.9-11.0), p<0.001, large effect size d=2.42. Increased ease of finding whom to call after discharge (p=0.001), identification of dosages/instructions (p=0.013) and reason for taking the medications (p<0.001) were most notable. Conclusions: Our findings suggest that critical information was easier to find on redesigned discharge format. We hope to incorporate these significant findings into future discharge instructions to improve future patient care.

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Introduction: In the total ankle replacement (TAR) literature, there has been focus on reporting complications that are directly observed clinically or by radiograph, including wound problems, technical errors, implant loosening, subsidence, infection, bone fractures, and heterotopic ossification. However, patients may still have unresolved pain following TAR even when these problems have been ruled out. Objectives: We initiated a study to more clearly define the relative risk of injury to the anatomic structures in the posterior ankle during TAR using a third generation implant system. Methodology: Ten fresh frozen adult cadaveric below-knee specimens were positioned in the intra-operative positioning frame of a total ankle replacement system, and adjusted to achieve proper foot alignment using fluoroscopic imaging. The relationship between the tibial cutting guide pins and the posterior neurovascular and tendon structures was measured using digital calipers. Results: High rates of posterior structure injury were found. Nearly all proximal-medial pins encountered a posteroomedial neurovascular structure, most commonly the tibial nerve. Distal medial pins mainly encountered posteroomedial tendinous structures, particularly the flexor digitorum longus tendon. The proximal lateral pins were highly likely to encounter the Achilles tendon and the sural nerve. Conclusion: Based on the primary outcome measure of direct contact between pins and structures, our results support our hypothesis that the tibial neurovascular structures are at the highest risk when preparing for and completing bony resection, particularly the medial and proximal cuts. Further study of TAR-related posterior structure injuries could result in a more informed approach to post-TAR complication evaluation and management.
B38  Title: Millennial Learning Styles  
Authors: Cody Reynolds, DO (PGY 4); Linette Archer, MD  
Affiliation: Marietta Memorial Hospital, Marietta, Ohio  

Introduction: The Millennial learners, or Generation ‘Y’, have grown up in a world in which any thought or question can immediately be answered by just “Googling it.” Without proper engagement and peer discussion, it is thought that this is perceived as being “spoken at”, rather than being talked with. A new type of learning model, called the T3 system, has been introduced into the curriculum at Marietta Memorial Hospital’s emergency medicine residency. It involves learning that is group based, self-driven and incorporates media to form answers to set questions. Physicians gather the information about a particular topic themselves, while in a didactic session, to compile and present to their peers. Objective: The objectives of the study are to determine the satisfaction levels of residents after incorporation of nontraditional lecturing methods. Methods: Residents will be introduced to new learning styles for 1 year and then have a survey to answer if they are the learning styles vs traditional power point lectures. Residents will answer in numbers, 1-5 from very unsatisfied to very satisfied. Results: Overall, residents were unsatisfied with the T3 learning portion of didactics with a score of 2.6. Residents also were more satisfied overall with traditional power point lectures with a score of 4.0. Residents were, however, much more satisfied with didactics overall than in years past after having multiple new learning styles factored in, not just T3, with a score of 4.6. Conclusion: In conclusion, my hypothesis of residents being in favor of the T3 model was incorrect. Residents were happier with other new lecture types, however, that had been introduced alongside T3 and happier with didactics overall.

B39  Title: Early Postoperative Glucose Control and Occurrence of Postoperative Atrial Fibrillation in Diabetic Coronary Artery Bypass Patients  
Author: Gregory K. Riffle, DO (PGY 3)  
Affiliation: Fairfield Medical Center, Lancaster, Ohio  

Introduction: Cardiovascular disease is a common complication in diabetic patients, some with advanced disease enough to warrant coronary artery bypass grafting (CABG). Postoperative atrial fibrillation (POAF) is a common complication in the postoperative period. Objectives: Investigate the occurrence of POAF with regard to early glycemic control in diabetics selected for CABG. Methodology: A retrospective chart review of 300 diabetic patients who underwent CABG was performed in a 222-bed community hospital. Data was collected on the mean 24-hour postoperative glucose and compared with data on the primary endpoint—the occurrence of POAF. Also monitored were length of stay, surgical wound infection, 30-day mortality, and 30-day readmission. Results: Of the 300 diabetics selected for CABG, 81 (27%) experienced POAF as evidenced by telemetry or electrocardiogram. 37 (45.7%) of those patients had a mean glucose of less than or equal to 150mg/dl. 44 (54.3%) of the patients had a mean glucose of greater than 150mg/dl. No statistically significant association was found between 24-hr postoperative glucose levels and occurrence of POAF, P = 0.58. However, patients with postoperative glucose levels 150mg/dl or less stayed longer in the hospital than those with levels greater than 150mg/dl, P = 0.031. Furthermore, postoperative glucose 150mg/dl or less was more likely associated with 30-day mortality than levels greater than 150mg/dl, P=0.05. Conclusion: A less strict blood glucose control in diabetics selected for CABG was associated with shorter length of stay postoperatively and a decrease in 30-day mortality though it showed no affect on the occurrence of POAF.

B40  Title: Laparoscopic Inguinal Hernia Repair Utilizing ProGrip™ Laparoscopic Self-Fixating Mesh: Technical Learning Curve and Short-Term Outcomes  
Authors: Heather Seedhouse, DO (PGY 1); Adrian Dan, MD; Gregory Johnston, DO  
Affiliations: 1Western Reserve Hospital, Cuyahoga Falls, Ohio; 2Summa Akron City Hospital, Akron, Ohio; 3Mercy Health, Akron, Ohio  

Purpose: Self-fixating mesh has been introduced to improve upon the already worthy results seen with laparoscopic inguinal hernia repair. An observational study was undertaken to evaluate the technical learning curve and short-term outcomes associated with the use of ProGrip™ laparoscopic self-fixating mesh in trans-abdominal pre-peritoneal (TAPP) inguinal herniorrhaphy. Methods: Over the span of 1 year, patients undergoing elective laparoscopic TAPP inguinal hernia repair by a single surgeon adopting ProGrip™ laparoscopic self-fixating mesh were studied. The primary outcome measures include mesh introduction to final position (MI-FP) time, surgical complications, and pain scores. Demographic and other peri-operative outcome data were also collected and analyzed. Results: Forty hernias were repaired in 29 patients with a laparoscopic TAPP approach. For the first 20 repairs, the average MI-FP time was 249.4 seconds and, for the last 20 patients, it was 118.6 seconds (p < 0.001). Minor post-operative surgical complications were experienced by 13.8% of patients. The average pain score was 0.9 (SD = 0.67, range 0-3) on a scale of 0 to 5. Conclusions: Surgeons with reasonable laparoscopic experience can expect to become fully proficient in the manipulation of self-fixating mesh about 15 to 20 repairs into their experience. Utilization of this product yielded notably low intra-operative and short-term post-operative complication rates, as well as low post-operative pain.

B41  Title: Efficacy Osteopathic Manipulative Therapy for Low Back and Pelvic Pain in Pregnancy  
Author: Robert D. Smith, DO (PGY 3)  
Affiliation: Montana Family Medicine Residency, Billings, Montana  

Introduction: Low Back and Pelvic Pain (LBPP) are common problems in pregnancy with significant associated morbidity. An Osteopathic Manipulative Treatment protocol has been designed specifically for treatment of pregnancy associated LBP. Objective: We sought to further evaluate the effectiveness of this protocol in reducing pregnancy related LBP. Methodology: Residents at Montana Family Medicine Residency (MFMR) were trained in the OMT protocol. Patients receiving OMT for LBPP during pregnancy were recruited into the study. Inclusion criteria were 20 weeks or greater gestation and presence of pregnancy related low back and/or pelvic pain. Exclusion criteria were history of spine surgery, placental abruption, placenta previa, or preeclampsia. Retrospective data was obtained by reviewing patients’ questionnaires regarding pain at the time of OMT. Patients were followed up by phone interview 3 days after OMT and asked to rate their back pain on a standardized pain scale and then again on their next visit. Results: Nine patients met inclusion criteria. Three dropped out due to inability to follow up. Four patients were followed up at three days and three patients were followed up at 15 days or greater. Standard 10 point pain scales improved at three days by a mean of 1.8 points (95% CI 0.12-3.38) and worsened at >=fifteen days by a mean of 1.8 points (95% CI 0.0-3.6). Summary: The OMT for LBPP in pregnancy protocol results in reduction in LBPP at 3 days; however, the effect is short lived indicating need for frequent treatment until parturition.
B42  Title: Development and Implementation of a Multidisciplinary Controlled Substance Committee within a Family Medicine Residency Clinic  
Authors: Vanessa Stagliano, MD (PGY 1); Kelly Raj, DO; Rachel Stulock, PharmD; Carl Tyler, MD, MSc  
Affiliation: Cleveland Clinic Foundation/Fairview Hospital Family Medicine Residency, Cleveland, Ohio  
Introduction: Appropriate prescribing of controlled substances is complex for physicians in post-graduate training environments. Patients are at risk for both under-treatment and inappropriate treatment of their chronic pain, and resident physicians are at risk for contributing to prescription drug abuse. Objectives: To address patient, resident and faculty physician dissatisfaction with controlled substance prescribing practices within a Family Medicine residency clinic, a Controlled Substance Committee was formed. This is an innovative, multi-disciplinary, patient- and learner-centered approach to caring for patients for whom controlled substances are prescribed. Goals of this committee include greater patient satisfaction with their chronic pain management and greater competency of resident physicians to effectively and safely prescribe controlled substances. Specific objectives include: Increasing clinician compliance with controlled substance prescribing, establishing documentation and monitoring requirements and reducing the number of patients who are prescribed controlled substances exceeding 80 mg morphine equivalent dose for non-malignant pain management. Methodology: A committee consisting of residents, faculty physicians, and a pharmacist was established to create and implement a structured controlled substance management protocol. The committee reviews cases of patients prescribed controlled substances within the practice on a systematic monitoring basis and per provider request. Results: We describe the development, composition, process and experiences to date with our Controlled Substance Committee. Summary/Conclusions: Systems to assure safe and effective prescribing of controlled substances need to be tailored to post-graduate training settings. We seek dialogue with attendees about their experience in teaching and monitoring the prescribing of controlled substances in their residency training sites.

B43  Title: Improving Patient Compliance by Changing the Way Providers Present Recommended Health Practices  
Authors: Bradley Stokes, DO (PGY 3); Joseph Reynolds, DO  
Affiliation: The Wright Center for Graduate Medical Education/Health Source of Ohio, Dayton, Ohio  
Introduction: Patient’s non-compliance concerning preventative health recommendations is a problem for health care providers everywhere. How much influence does a provider have on what decisions a patient makes once they leave the office? If providers were able to present recommendations in a way that improves patient compliance, would that improve health outcomes and would that be applicable to the myriad of health recommendations primary care providers make on daily basis? Objective: The objective of this study was to establish whether or not the way a recommendation is presented influences the patient compliance rate. Methodology: A list of all patients age 65 and older, who had been treated at a Health Source of Ohio clinic in the last two years, was compiled. Those individuals who had not had the recommended pneumonia vaccination were selected and randomized into three groups. One group received a letter stating only that the vaccine was recommended and that they should come and get it. The second group received a letter stating the same recommendation but also providing a list of proven benefits of the vaccine. The third group received no letter. After a 6 month period of time the data was collected for statistical analysis. Results: Preliminary results showed that the groups who received a letter complied at a higher rate than those who did not. Conclusions: Improving the way that providers present health care recommendations can be an effective way to improve patient’s compliance to recommended health practices and more research in this area is warranted.

B44  Title: Canthal Cutdown for Emergent Treatment of Orbital Compartment Syndrome: Original Investigation  
Authors: Andrew T. Strand, DO (PGY 3); Craig N. Czyz, DO; Amanda Gibson, DO (PGY 2)  
Affiliation: OhioHealth/Doctors Hospital Department of Ophthalmology, Columbus, Ohio  
Importance: Alternative surgical interventions in cases of orbital compartment syndrome. Objective: To evaluate the use of a “canthal cutdown” technique to reduce orbital pressure for treatment of orbital compartment syndrome in a human cadaver model. Design: Human cadaver model with simulated ocular compartment syndrome/retrobulbar hemorrhage. Methods: Five fresh cadaver heads, 10 orbits, were used to create a dynamic model of orbital compartment syndrome. All orbits were injected, in a 5 mL step-wise fashion to a total of 20 mL, with a blood analog solution. Two compartment pressure probes in different orbital locations were used to monitor orbital pressure. After injecting 20 mL of solution, orbital pressure was monitored during successive procedures: lateral canthotomy, inferior cantholysis, superior cantholysis, and a canthal cutdown. After completion of the cutdown, the orbit was re-injected with an additional 10 mL of solution, to simulate a dynamic orbital hemorrhage, and serial pressure measurements were recorded over a 10 minute duration. Results: There was no statistically significant difference between the two orbital pressure monitoring device recordings at each measurement point (p = 0.99). At each injection step orbital pressure was significantly elevated compared to baseline (probe 1 p = 0.03 and probe 2 p = 0.003). Following completion of the canthal cutdown and re-injection of 10 mL of solution, orbital pressure was not increased from baseline readings (probe 1 p = 0.83 and probe 2 p = 0.83). Conclusion: The canthal cutdown technique provides increased reduction in orbital pressure versus canthotomy and cantholysis alone. The technique is also an effective short-term treatment for active orbital hemorrhages allowing for an increased definitive treatment window.
Dental students have the capacity and desire to learn and retain more in-depth knowledge pertaining to osteopathic primary care. Learning and becoming skilled at osteopathic core competencies should increase student confidence to incorporate these aspects into future practice, as well as, increase the dialogue between medical and dental healthcare providers, ultimately leading to better and more efficient patient care.

We recommend this course be implemented and further researched at dental schools across the United States.

**Results:**

The difference between pre-course test and post-course test group means was significant (P <.0001). The group means pre-course test and post-course test were 42.40% and 86.06% respectively.

**Conclusion:**

A personalized telephone reminder to complete the HPV vaccination series significantly increased completion rates compared to telephone invitation by nurse or PSR.

**Hypothesis:**

Personalized telephone reminder from the physician will result in better completion rates compared to telephone invitation by nurse or PSR.

**Objectives:**

1. Will telephone reminders by physician, nursing/medical assistant (MA), or patient service representative (PSR) increase completion of the 3- vaccination series for HPV?

**Methods:**

This is a study in progress. Two months following the intervention, HPV status of the study population will be assessed by review of electronic medical records.
**B49 Title:** Lifestyle Medicine in Clinical Practice: Initial Findings of a Retrospective Cohort  
**Authors:** Joseph Vogelgesang (OMS IV); David Drozek, DO  
**Affiliation:** Ohio University Heritage College of Osteopathic Medicine, Athens, Ohio

**Introduction:** Lifestyle medicine programs (LMPs) which focus on nutrition, physical activity and stress management improve the health of participants, but are time intensive for physicians and poorly reimbursed. The Affordable Care Act has developed codes to address this problem. **Objectives:** Reported is an initial series of shared medical appointments in a larger pilot study investigating the cost effectiveness of one LMP regarding patient benefit and physician reimbursement. **Methodology:** The Lifestyle Medicine Clinic Small Group consists of 6 one-hour group sessions delivered over 8 weeks. The program emphasizes a whole food plant-based diet, 30 minutes of daily exercise, and stress management techniques. Biometric data were gathered before and after the program. Current Procedural Terminology codes were correlated with reimbursement from 9 insurance providers. **Results:** Ten female patients aged 43-84 enrolled in the class. Nine attended at least half of the sessions and 5 completed the post program evaluation. **Biometric Results:** On average those completing the assessment demonstrated improvement in weight (-2.5%), total cholesterol (-12.4%), low-density lipoprotein cholesterol (-21.7%), fasting blood glucose (-15.1%), mood (-21.1% as measured by Beck Depression Inventory) and sense of well-being (+9.7% as measured by Rand Short Form 36-Item Health Survey). **Coding Results:** The majority of commercial health insurers (80%) paid for the selected codes, however Medicare and Medicaid (18%) accepted very few. Patient co-pay requirements varied widely. **Summary/Conclusion:** Although LMPs are successful in achieving improvement of biomarkers in patients who complete the programs, physician compensation is not consistent across insurance providers.

**B50 Title:** Patient Satisfaction: Development of Ethnically and Physically Diverse Educational Materials for Physician Discussion of Surgical Breast Cancer Treatment Options  
**Authors:** Carrie Watson, DO (PGY 5); Constance Cashen, DO, FACOS, FACS; Julie Stausmire, MSN, RN, ACNS-BC; Kristina Burgard, RVT  
**Affiliation:** Mercy St. Vincent Medical Center, Toledo, Ohio

**Introduction:** Breast cancer is an emotionally charged topic. Comprehending the surgical treatment options allows patients to feel informed and empowered about their treatment plan. My hypothesis was currently utilized educational materials are insufficient relative to lack of diversity for culture, ethnicity, and body size as they lack realism. **Objectives:** Determine perceived educational effectiveness of audiovisual materials previously used with breast cancer surgical patients in Northwest Ohio between 2010-2014. Develop 3D visual aid models that are currently nonexistent commercially. Describe the perceived realism of investigator-developed 3D life-size torso models as measured by a post-operative cohort using a standardized checklist. **Methodology:** This is a descriptive prospective cohort study. An anonymous-response survey was sent to adult female post breast cancer surgery patients from a residency-run surgery office and a private surgery office. An option to participate in focus groups to provide feedback on investigator-developed 3D breast cancer models for education was included with the survey. 3D torso models using live models representing different patient sizes and ethnicities were created and refined using survey results and focus group suggestions. **Results:** Survey responses were summarized with descriptive statistics. Focus group feedback remains in progress. **Summary/Conclusion:** The models have been continuously evaluated for perceived realism and educational effectiveness by the focus group using the Perceived Realism and Educational Effectiveness of 3D Model Checklist. Removable parts were developed to show the difference between a mastectomy and a lumpectomy on different body types. A future planned study will evaluate if patients find the models to be educationally effective from preoperative and postoperative perspectives, increasing satisfaction regarding surgical consultation and providing a more realistic expectation of final surgical results.

**B51 Title:** Association between Insurance Status and Patient Safety in Adult Spinal Deformity Surgery  
**Authors:** Matthew R. Webb (OMS III); Joseph Tanenbaum, BA; Vince Alentado, BS; Thomas Mroz, MD  
**Affiliations:** Ohio University Heritage College of Osteopathic Medicine, Athens, Ohio; Case Western Reserve School of Medicine, Cleveland, Ohio; Cleveland Clinic Center for Spine Health, Cleveland, Ohio

**Introduction:** Patient safety indicators (PSI) are a standardized measure of care quality used to determine hospital reimbursement. The incidence of PSI among patients undergoing surgery for adult spinal deformity is unknown. The association between insurance status with PSI incidence is also unknown in this population. **Objective:** We determined the national incidence of adverse care quality events among adult spinal deformity patients undergoing spinal fusion. The association between insurance status and care quality was quantified for this population. **Methods:** ICD-9-CM codes were used to query Nationwide Inpatient Sample (NIS) data for all cases of adult spinal deformity treated with spinal fusion from 1998 to 2011. The incidence of PSI among adult spinal deformity patients undergoing spinal fusion was determined through diagnosis codes published by CMS. The association between insurance status and PSI incidence was determined using a logistic regression model that controlled for patient demographics, patient comorbidities, and hospital characteristics. **Results:** The analysis included 47,770 patients that underwent spinal fusion. The estimated national incidence of experiencing one or more PSI was 5,300 per 100,000 patient years of observation. Adjusting for patient demographics and hospital characteristics, relative to privately insured patients, Medicaid/self-pay patients had significantly greater odds of experiencing one or more PSI during the inpatient episode following spinal fusion for adult spinal deformity (OR 1.37, 95% CI 1.09-1.63). **Conclusion:** Significant disparities exist in quality of care among differently insured patients with spinal deformity that underwent spinal fusion. Further study is needed to understand the causes of the observed disparities.
BS2  
**Title:** Ultrasound Training in American Osteopathic Medical Schools  
**Authors:** Adam Woodyard (OMS I); Todd R. Fredricks, DO; Masato Nakazawa, PhD  
**Affiliation:** Ohio University Heritage College of Osteopathic Medicine, Athens, Ohio  

**Introduction:** Ultrasound is a rapidly progressing and under-utilized technology within clinical medicine. Physician-operated, focused ultrasound at the bedside has the potential to improve clinical outcomes, but a major barrier for this diagnostic tool is lack of standardized ultrasound education. Point-of-care ultrasound (PoCUS) education is not uniformly offered by American medical schools. The implementation of ultrasound education at the undergraduate level and the attitudes of administrators towards ultrasound has been studied in allopathic medical schools, but such data has not yet been collected from osteopathic medical schools. **Objectives:** To collect and analyze data regarding the implementation of ultrasound at the undergraduate medical education level within American osteopathic medical schools. Data was also collected regarding curriculum administrators opinions towards ultrasound education and barriers to implementation. **Methodology:** Qualtrics technology was used to adapt the ultrasound survey created by Bahner et al. for osteopathic medical schools. This survey was distributed to 267 public domain emails of curriculum administrators of all 49 osteopathic medical schools and branch locations. The survey requested information regarding the state of ultrasound education at each institution, along with opinions and barriers toward integration within the existing medical curriculum. The responses were analyzed using frequency and distribution, and the barrier responses were subject to Rasch analysis. **Results:** Pending analysis. **Conclusion:** Pending analysis.

BS3  
**Title:** State of Ultrasound Training in American Medical Schools  
**Authors:** Adam Woodyard (OMS I); Todd R. Fredricks, DO; Masato Nakazawa, PhD  
**Affiliation:** Ohio University Heritage College of Osteopathic Medicine, Athens, Ohio  

**Introduction:** A major barrier for greater implementation of physician-operated, Point-of-Care Ultrasound (POCUS) is a lack of standardized ultrasound education. The status of ultrasound education and the attitudes of administrators towards ultrasound at American osteopathic and allopathic medical schools will be presented. **Objectives:** To compare and analyze data regarding the implementation of ultrasound at the undergraduate level within American osteopathic and allopathic medical schools. The data collected from osteopathic schools will be analyzed against the data from allopathic medical schools collected by Bahner et al. **Methodology:** Qualtrics technology was used to adapt the ultrasound survey created by Bahner et al. for osteopathic medical schools. This survey was distributed to 267 public domain emails of curriculum administrators of all 49 osteopathic medical schools and branch locations. The survey requested information regarding the state of ultrasound education at each institution, along with opinions and barriers toward integration within the existing medical curriculum. The responses were analyzed using frequency and distribution, and the barrier responses were subject to Rasch analysis. The collected data was compared and contrasted to the allopathic data collected by Bahner et al. **Results:** Pending analysis. **Conclusion:** Pending analysis.
Case Study Competition Abstracts
C1  Title:  Kicker with a Shoulder Problem
Authors:  Ben Ahrens, DO (PGY 2); Monique Brady, MD
Affiliation:  OhioHealth/Riverside Methodist Hospital Family Medicine, Columbus, Ohio

Introduction: Healthy patients with uncommon complaints should always raise red flags. This case details the workup of such presentation, an uncommon diagnosis, and an unorthodox management plan. Positive patient outcome was the result of multi-specialty collaboration and the sharing of this case has educational value for physicians at any level. Case Description: An 18-year-old male high school football kicker presented with a one-month history of right shoulder aching, exacerbated by overhead activities. Associated symptoms included swelling and tightness, and intermittent numbness/tingling in the right arm. The patient denied weakness, acute injury, and had no history of dislocation, subluxation, joint injection, or prior imaging studies. Physical exam was significant for right biceps measuring 33cm and left measuring 31cm. Duplex venous ultrasound of the right arm showed extensive thrombus nearly occluding the entire right subclavian, axillary, basilic, and brachial veins. Discussion: Patient was diagnosed with primary upper extremity deep vein thrombosis, Paget – Schrotter Syndrome. Hereditary coagulopathy and malignancy workups were negative. He was admitted for inpatient anticoagulation and thrombolysis, and discharged on subcutaneous Lovenox, which was held on football game days. He was scheduled for first rib resection. Conclusion: This case presents an unusual etiology for shoulder pain and swelling. PUEDVT is extremely rare in healthy athletes but has potential for significant morbidity. This patient received appropriate inpatient treatment, but recommendations for outpatient therapy, definitive treatment, and return to sport are less established and more case-specific. Discussion of this case adds to a limited knowledge base, providing insight for physicians at any level.

C2  Title:  Omental Artery Pseudoaneurysm Rupture Presenting as Acute Abdominal and Flank Pain
Authors:  Adem Aktas (OMS III); Christine Ou, DO (PGY 5); John Leskovan, DO; Bilal Ahmad Saleh, MD
Affiliations:  1Kansas City University of Medicine and Biosciences, Kansas City, Missouri; 2Mercy St. Vincent Medical Center, Toledo, Ohio

Introduction: Spontaneous omental artery rupture is a rare condition with life threatening consequences. Treatment includes transcatheter arterial embolization (TAE) or surgery. We present a patient who suffered from an omental artery rupture with no prior history of anticoagulation therapy, neoplasm, penetrating/blunt trauma, or significant family history. Case Presentation: A 63 year old male presented to emergency department with sudden onset abdominal pain. Medical and family histories were unremarkable. Vital signs showed a blood pressure of 125/81 and a heart rate of 71. Contrast enhanced CT showed hemoperitoneum with a 1.4cm ruptured left omental artery pseudoaneurysm. Patient underwent urgent angiography which showed left omental artery pseudoaneurysm with a normal splenic artery. Coil embolization was performed. Post embolization arteriogram demonstrated cessation of extravasation. Patient’s abdominal pain improved and the patient was discharged on the 2nd hospital day. Discussion: Omental artery pseudoaneurysm rupture is a rare but serious complication that can result in intra-abdominal hemorrhage. Patients can present with symptoms of acute abdominal/flank pain, tenderness, subcutaneous bleeding (Cullen’s sign), tachycardia and hypotension. Risk factors include HTN, diabetes, CAD, tobacco use, malignancy, past abdominal surgeries and past history of aneurysms. Conclusion: Medical personnel should have a high index of suspicion for intraabdominal bleed. After thorough physical examination, CT imaging followed by angiography should be performed if intraabdominal bleed is suspected. Coil embolization should be the first choice therapy due to it being minimally invasive as well as its low risk of complications. If unable to treat with coil embolization, open abdominal surgery with resection of aneurysm is the next step.

C3  Title:  A Case of Dermatitis Herpetiformis with Negative DIF in a Patient on Adalimumab
Author:  Amanda Allen, DO (PGY 1)
Affiliation:  OhioHealth/Riverside Methodist Hospital, Columbus, Ohio

Introduction: Dermatitis Herpetiformis is an autoimmune vesiculobulbous skin disease associated with gluten-sensitive enteropathy. Early cutaneous lesions are often confused for more common skin diseases such as atopic dermatitis and psoriasis. Currently, the gold standard for diagnosis of dermatitis herpetiformis is direct immunofluorescence on skin biopsy for IgA revealing a classical granular appearance at the dermal-epidermal junction. Case Description: A 43 year-old male presented for evaluation of psoriasis vulgaris with a chief complaint of severe pruritus currently treated with Adalimumab. Physical examination revealed multiple small excoriated areas on the posterior neck, elbows, abdomen, and posterior scalp. Initial biopsy for DIF was negative. Eight weeks after the last dose of adalimumab was administered, repeat biopsies were obtained which demonstrated IgA deposits at the dermal-epidermal junction. Discussion: The pathogenesis of this disease is unknown; however, a multifactorial etiology involving genetic, environmental, and immune dysregulation is currently accepted. Increasing studies have identified epidermal transglutaminase-IgA complexes as the deposits localized to the dermal-epidermal junction. This interaction is responsible for the granular appearance in DIF. Conclusion: Our case suggests that factors beyond the IgA-epidermal transglutaminase interaction are necessary for the formation of the subepidermal blister at the dermal-epidermal junction. Furthermore, the change in DIF with discontinuation of adalimumab may also suggest an interaction with IgA anti-epidermal transglutaminase. This monoclonal antibody may be capable of cross linking receptors on neutrophils resulting in activation and recruitment of additional inflammatory cells resulting in vesicular disease.

C4  Title:  A Rare Cause of Acute, Idiopathic, Fulminant Respiratory Failure
Authors:  Anastasia Bessas, DO (PGY 2); Jarrod Bruce, MD
Affiliation:  Fairfield Medical Center, Lancaster, Ohio

Hamman-Rich syndrome is a rare form of interstitial pneumonia causing acute, fulminant lung injury. The patient was a 65 year old white female with history of psoriasis on Humira who presented to the pulmonology clinic for pulmonary fibrosis workup. At that time she had a CT scan of the chest which revealed ground glass opacities and diffuse reticulations consistent with pulmonary fibrosis. There was concern for drug-induced interstitial disease caused by Humira, but the patient remained on this medication. Four months later, she presented to the hospital for increasing shortness of breath and cough of one week’s duration. Upon hospitalization, Humira was discontinued and high dose intravenous steroids were administered. However, her condition continued to rapidly decline. A decision was made for the patient to undergo lung biopsy, however there was concern that she may be difficult to wean from the ventilator post operatively. The patient underwent lung biopsy revealing diffuse alveolar damage on histology. She required ongoing ventilator support post operatively with high positive end expiratory pressures. However on post-operative day three, there was an acute decline in the patient’s respiratory status. Evaluation revealed barotrauma-induced pneumothorax, requiring chest tube insertion. Despite adequate support, the patient continued to decline and passed away later that day. Hamman-Rich syndrome is an acute interstitial pneumonia which demonstrates the management and workup of a rapidly progressive, rare cause of acute respiratory failure that is poorly responsive to steroids or mechanical ventilation.
C5 Title: An Uncommon Cause of Shoulder Pain in an Elite Collegiate Swimmer
Authors: Benjamin V. Bring DO (Fellow); Natalie Dick, DO; Doug DiOrio, MD
Affiliations: 1OhioHealth/Riverside Methodist Hospital, Columbus, Ohio; 2Max Sports OhioHealth, Columbus, Ohio
Introduction: Shoulder pain in swimmers is common and often difficult to diagnose. A thorough history and physical exam along with appropriate diagnostic tests can help differentiate possible causes of acute shoulder pain. Case Description: A 21 year old collegiate swimmer presents to the training room with neck and scapular pain for 2 weeks with no reported injury. He initially noticed arm weakness with weight-lifting and complains of fatigue during exercise especially with overhead swimming strokes. Rest improves his symptoms and he denies radiculopathy, paresthesias, and numbness in the upper extremity. Examination reveals prominent medial border of the right scapula with push-up motion against a wall and scapular dyskinesia. Restricted range of motion was identified at C4/S and T4/S with normal reflexes. EMG reveals a right long thoracic mononeuropathy. Diagnostic ultrasound also shows neuropathy of the right long thoracic nerve with atrophy of the serratus anterior muscle. The patient was diagnosed with neuralgic amyotrophy (Parsonage Turner Syndrome). Discussion: Neuralgic amyotrophy is uncommon and has an incidence of 1.64 per 100,000 people. Common causes of this condition include infection, trauma, rheumatic disease, recent immunization, pregnancy, and surgery. Treatment consists of pain control, oral steroids, osteopathic manipulation, TENS unit, and acupuncture along with a series of comprehensive physical therapy sessions. Conclusion: Parsonage Turner Syndrome can present suddenly with severe pain and can be difficult to diagnose in the acute setting. Appropriate clinical evaluation, prompt diagnostics with EMG and ultrasound, and early physical therapy generally leads to full recovery and function.

C6 Title: The Ingested Button Battery - A Can't Miss Diagnosis
Authors: Sean Carlson, DO (Fellow); Cody Young, DO
Affiliation: Nationwide Children’s Hospital, Columbus, Ohio
Introduction: Foreign body ingestions are relatively common occurrences in the pediatric population. While many ingested foreign bodies pass through the gastrointestinal tract without complication, certain types of foreign bodies pose a significantly greater risk of complication if not recognized early and managed promptly. Case Description: A 6 year old male was transferred to the emergency department from an urgent care after a radiograph revealed a round radiopaque foreign body projecting in the region of the mid thoracic esophagus. The foreign body had a lucent ring around the periphery, unlike a traditional coin, and was compatible with a button battery. The patient denied shortness of breath or coughing, but experienced two episodes of vomiting. Given the location, the patient was taken to the operating room for upper endoscopy. The battery was removed. While the esophageal wall was not perforated, there was apparent necrosis of the mucosa where the battery was lodged. Discussion: Thousands of button battery ingestions have occurred over the preceding decades in children. If the button batteries become lodged within the esophagus, the electrical current, battery leakage, and physical pressure may contribute to damage of the underlying mucosa. These patients are at risk for fistulas, esophageal perforation or strictures, and even massive hemorrhage from damage to adjacent vasculature. Conclusion: Button batteries can have a similar appearance to coins to the untrained eye, but the potential complications from a button battery lodged in the esophagus are far more severe and require emergent attention. Recognition of the differences and a prompt diagnosis may be life-saving.

C7 Title: Spontaneous, Uncontrollable Bouts of Laughter: A Case Report
Authors: Sean Carlson, DO (Fellow); Nicholas Zumberge, MD
Affiliation: Nationwide Children’s Hospital, Columbus, Ohio
Introduction: Gelastic seizures are an uncommon form of epilepsy characterized by bouts of laughter without a precipitating humorous stimulus. Gelastic seizures are most commonly associated with hypothalamic hamartomas. Case Description: A 5 year old male was brought by his parents to outpatient neurology. Over the years prior to presentation, the patient had been experiencing two to three brief episodes of laughter each day for no apparent reason, with each episode lasting between 15-30 seconds. Over the month before presentation though, these laughing episodes were occasionally followed by a blank stare and fatigue which prompted self-referral to neurology. An MRI of the brain with contrast was ordered and demonstrated a small mass along the floor of the hypothalamus, demonstrating similar signal characteristics to gray matter. The findings were compatible with a hypothalamic hamartoma. Discussion: Gelastic seizures are an uncommon form of epilepsy typically diagnosed in childhood and are characterized by episodic uncontrollable bouts of laughing, generally for short periods of time, with no clear preceding stimulus. Hypothalamic hamartomas are the typical etiology and are considered to be along the spectrum of gray matter heterotopias. Other signs/symptoms of hypothalamic hamartomas include precocious puberty, other types of seizures, and behavioral changes. Medical and surgical treatment options are available. Conclusion: A diagnosis of gelastic seizures may be delayed due to the unusual presentation. In the presence of signs consistent with gelastic seizures, imaging with MRI is indicated to evaluate for the presence of a hypothalamic hamartoma.

C8 Title: Concussion and OMM: An Adolescent Case Presentation
Authors: Iris Castillo, DO (PGY 3)1; Kimberly Wolf, DO; Alex Rakowsky, MD
Affiliations: 1OhioHealth/Doctor’s Hospital, Columbus, Ohio; 2Nationwide Children’s Hospital, Columbus, Ohio
Introduction: Concussions occur frequently in adolescent patients. Current recommendations for concussion treatment involve rest with step-wise return to activity with adjunctive medications. While the majority of patients have resolution of symptoms within 7-10 days of the initial injury, about 11% of patients continue to have symptoms at 3 months and 2.3% at 1 year. The pathophysiology of prolonged symptoms is not well understood, thus standard treatments options are not available. The role of Osteopathic Manipulative Medicine (OMM) in treating patients with concussions is not clear. However, somatic dysfunction could contribute to the prolonged symptoms leading to a possible role for OMM in helping patients to recover sooner. Case Description: An adolescent female sustained a moderate concussion from a direct blow to her right temporal region. She experienced several concussion symptoms, including headache, phonophobia/photophobia, dizziness, and difficulty concentrating. Her primary concussion management was completed at a local sports medicine clinic, which led to a referral to our Pediatric OMM clinic. Discussion: The patient had serial OMM treatments, which included cranial techniques, soft tissue, muscle energy, and balance ligamentous tension, in different regions. Each treatment was directed to her initial head injury, and somatic dysfunctions related to her body’s compensatory mechanisms. Sports medicine physicians that saw her in between treatments noted improvement in symptoms. After successive treatments, her symptoms resolved and she was able to resume all previous activities. Conclusion: Although there are no current studies to show the efficacy of OMM in the management of concussions, this patient showed significant improvement in her symptoms and quality of life. This case shows that OMM can have an important adjunctive therapy in the management of concussions with prolonged symptoms.
C9
Title: The Knife Averted: A Case of Intestinal Angioedema
Authors: Maureen Cheung, DO (PGY 2); Jason Fried, DO
Affiliation: Western Reserve Hospital, Cuyahoga Falls, Ohio

Introduction: Intestinal angioedema is a rare entity reported in literature for its unusual presentation and potential for unnecessary surgical interventions. Typically presenting with abdominal pain, nausea, vomiting, and diarrhea, imaging demonstrates small-bowel thickening and free fluid consistent with infectious or ischemic injuries. Presentation of Case: We report a case of intestinal angioedema with progression to oropharynx involvement. A 74-year-old African American female presented to the emergency department with 6 hours of increasing abdominal pain, nausea, and vomiting. She reported 2 months of similar episodes associated with her evening meals. Past medical history includes CAD, HTN, CABG, and ischemic colitis. The patient was excessively tender to palpation without perforitis. Imaging revealed moderate, diffuse, small-bowel wall-thickening with adjacent fat stranding, and ascites. Surgery was consulted due to concern for ischemic process. During surgical evaluation, mild left-sided tongue and soft palate swelling was noted which continued to progress throughout examination. Immediate steroid and antihistamine therapy was initiated. The patient responded well with subsequent resolution of her abdominal pain within 4 to 6 hours. Upon further questioning, it was discovered ACE-Inhibitor therapy had been initiated 10 weeks prior; the patient was diagnosed with recurrent intestinal angioedema and the ACE-I was discontinued. She remains symptom free to date. Discussion: Angioedema and urticaria has a reported incidence of 10-20% worldwide. ACE-I’s are responsible for 0.1-2.2% of cases. There is little data available on intestinal manifestations, however it has been documented due to its misdiagnosis leading to unnecessary surgical interventions. It is likely intestinal angioedema is an underestimated condition which presents a confusing clinical picture. Conclusion: Recognition and management of intestinal angioedema is paramount as it can progress to airway involvement and lead to potentially unnecessary surgical procedures. A high index of suspicion combined with thorough history and physical are necessary for diagnosis.

C10 WITHDRAWN

C11
Title: Necrotizing Fasciitis Following Radiofrequency Ablation
Authors: Kristin Cola, DO (PGY 3) ; Matthew Noble, BS (OMS II) ; Sean Keyes, DO ; Douglas Chonko, DO
Affiliations: 1Western Reserve Hospital, Cuyahoga Falls, Ohio; 2Ohio University Heritage College of Osteopathic Medicine, Athens, Ohio

Necrotizing fasciitis is a rare, life-threatening, and rapidly progressive infection resulting in soft tissue necrosis. Differentiating necrotizing fasciitis from common skin infections can be challenging. We describe what we believe to be the first case of necrotizing fasciitis after radiofrequency ablation. A 64-year-old male with multiple medical comorbidities underwent radiofrequency ablation of S2–S4 nerve roots. The patient presented to the emergency department 16 hours later with extreme back pain that started 4 hours earlier. The patient was sent home but returned 6 hours later and was admitted for inability to ambulate and intractable back pain. Orthopedic Surgery consultation was obtained for crepitus in the lower extremity. During evaluation, the patient’s medical condition rapidly declined. The patient was taken to the operating room emergently for surgical debridement and fasciotomy. Post-operatively the patient was admitted to ICU, but his condition declined and he passed away within a few hours. Blood cultures and intraoperative cultures demonstrated Clostridium perfringens. This case demonstrates the occurrence of necrotizing fasciitis after radiofrequency ablation performed with sterile principles. Risk factors for mortality include age >60, thrombocytopenia, acute renal failure, elevated blood lactate, bacteremia, clostridial infection, band neutrophils >10, and a delay in surgical debridement >24 hours. Most cases of necrotizing fasciitis are polymicrobial. Clostridium perfringens is a gram positive rod found in soil and the gastrointestinal tract. Reflection on this case reveals this patient to have multiple risk factors predictive of mortality. Recognizing these factors early will help provide expectations for the treating team and the family members.

C12
Title: High Risk Behavior, Hepatitis, and Nephropathy: Think Syphilis
Authors: Michael Comianos, DO (PGY 2); C. Shilpa Kollipara, DO; Kim Jordan, MD, FACP
Affiliation: OhioHealth/Riverside Methodist Hospital Internal Medicine, Columbus, Ohio

Syphilis cases in the US increased by 10% between 2012 and 2013. Recognition of common and uncommon manifestations remains important.

Case 1: A 45-year-old male with high risk sexual behavior presented with painless jaundice. Bilirubin was 9.1, alkaline phosphatase 1626, AST 252 and ALT 407. Nephrotic range proteinuria, inactive urine sediment and normal creatinine were noted. HIV was negative, but RPR was 1:64 with positive syphilis IgG antibody. Liver biopsy showed non-specific findings. Hepatic and renal findings were deemed secondary to syphilis and penicillin was prescribed.

Case 2: A 68-year-old male received bicillin for secondary syphilis, with improved RPR from 1:64 to 1:16. He presented one month later with anasarca, nephrotic range proteinuria, and normal creatinine. Complement studies, HIV, antistreptolysin-O, thyroid, and hepatic studies were normal. Repeat RPR was 1:65. Nephrology and ID consultants suspected syphilis-associated renal disease, expected full symptom resolution with time, and recommended ACEI and diuretic therapy only. Six weeks later, repeat RPR was 1:128. He denied re-exposure, but was prescribed doxycycline. Subsequently, all symptoms resolved and RPR was 1:8. Discussion: Elevated transaminase levels occur in 50% of secondary syphilis cases, but clinical hepatitis with jaundice is rare. Prevalence of renal disease from syphilis is about 0.3%, and proteinuria is most commonly seen. Proposed pathologic mechanisms include direct portal venous inoculation and immune complex-mediated disease. Symptoms resolve with penicillin treatment in one week to several months, without chronic sequelae.
C13 Title: Asymptomatic Inverting Papilloma of Sphenoid Sinus
Authors: Maria Compton, DO (PGY 5); Phil Khalil, DO
Affiliation: Western Reserve Hospital, Cuyahoga Falls, Ohio

Introduction: Sinonasal tumors are an uncommon, but important part of the otolaryngology practice. Inverted papillomas are the second most common benign sinonasal tumors behind osteomas. These masses are typically found on the lateral nasal wall and maxillary sinus. While, these neoplasms may be seen eroding into other paranasal sinuses from the maxillary sinus or nasal cavity, it is very rare for them to be isolated in other sinuses. They are important to recognize because of their malignant potential. Case Description: This was an isolated case of an asymptomatic inverting papilloma of the sphenoid sinus. This is an uncommon presentation and location of a sinonasal tumor that has malignant potential. The case history, presentation, evaluation, imaging, and surgical pathology was reviewed and reported. Discussion: This patient presented with a unique location for her lesion and on presentation she was asymptomatic. Perhaps, as the lesion became more destructive she would have developed symptoms. In modern medicine, frequent imaging has revealed incidental findings. Often, they are of unknown clinical significance. In this case, there is a malignant and invasive potential to these neoplasms. The incidental finding of this neoplasm saved the patient from a more extensive surgery than if found later in this patient’s life. Conclusion: This rare tumor, in a unique location was asymptomatic to this patient. This makes follow up examinations very important as the tumor has a malignant potential. The patient was followed to one year, for this report and did not have any signs of recurrent disease.

C14 Title: Case Reports of Ten Patients with Blood Zinc Level below 50 µg/mL
Authors: Charles Ebersbacher (OMS 2); Bing-Juun Shen; Jen-Tzer Gau, MD, PhD
Affiliations: 1Ohio University Heritage College of Osteopathic Medicine, Athens, Ohio; 2Nanyang Technological University, Singapore

Background: Zinc (Zn) is an important micronutrient. Evidence suggests that Zn deficiency associated with depression and poor mental health. Here we reported ten nursing home patients who were found moderate to severe Zn deficiency having a high percentage of mental health issues. Cases: Seven of ten were female, and the average age was 80±15 years old. Their blood Zn levels ranged from 0.27 to 0.49, and mean Zn level was 0.45±0.07 µg/mL. Eight of the 10 patients had behavioral disturbance with increasing demand for the nursing staff’s attention and required frequent physician visits (3 visits in one month). Three patients with significant comorbidities had considerably lower Zn levels. The first was a 78 year-old man with rectal cancer receiving rectal resection 2 months prior to the admission having Zn level 0.42 µg/mL who suffered malnutrition, hypomagnesemia, and iron-deficiency anemia. The second was a 97 year-old female with dementia whose Zn level 0.41 µg/mL presenting with diarrhea and increasing confusion and agitation. The most severe was a 53 year-old female with a Zn level 0.27 µg/mL who had hepatitis C and liver cirrhosis with albumin level 2.0 gram/dL. Conclusion: This case report highlighted increased agitation and behavioral disturbance among patients with low blood Zn levels, particularly with levels below 0.50 µg/mL. More studies on the association between lower Zn levels with increased behavioral disturbance and decreased mental health status are needed.

C15 Title: Pancreatic Divisum: A Case of Recurrent Pancreatitis
Authors: James Everhart, DO (PGY 2); Jennifer Ney, DO
Affiliation: Adena Regional Medical Center Internal Medicine Residency, Chillicothe, Ohio

Introduction: A 48 y.o. female admitted to the hospital for acute pancreatitis. Diagnosis was confirmed by clinical presentation, elevated pancreatic enzymes, and imaging. This was the 3rd admission for acute pancreatitis within the past 3 months. Despite a thorough history and physical, review of systems including medications and recent laboratory testing, the etiology remained elusive. Consequently an MRCP was performed and revealed pancreatic divisum. Outcome: The patient’s symptoms resolved. She was discharged 3 days later. Conclusion: Pancreatic divisum is the most common congenital abnormality of the pancreas. The relationship between pancreatic divisum and recurrent idiopathic pancreatitis is controversial. Endoscopic and surgical strategies exist which may improve symptoms and recurrence rates. However, much remains unknown regarding this anatomic variant and its role in pathology. Further investigation is warranted.

C16 Title: Gemcitabine-Induced Myositis and Rhabdomyolysis in Cholangiocarcinoma/Hepatocellular Carcinoma
Authors: Ashley Gabbard, DO (PGY 3); Manisha Nanda, DO
Affiliation: Grandview Medical Center, Dayton, Ohio

Gemcitabine-induced myositis has only been described a handful of times in the clinical oncology literature. The case report involves a 72-year-old Caucasian gentleman diagnosed with cholangiocarcinoma and hepatocellular carcinoma. The patient experienced myositis and rhabdomyolysis after day #1 cycle #4 of gemcitabine in combination with cisplatin. This patient required hemodialysis and eventual placement of a tunnel-dialysis catheter, as his renal function did not fully recover. A literature review revealed four (4) other relevant instances of gemcitabine induced-myositis. Awareness of this potential rare side effect is important when considering a differential diagnosis of myositis in a patient who has received a chemotherapeutic agent.

C17 Title: Minimally Invasive In Vivo Orbital Pressure Measurement
Authors: Amanda Gibson, DO (PGY 2); Craig N. Cryz, DO; Andrew T. Strand, DO (PGY 3)
Affiliation: OhioHealth/Doctor’s Hospital, Columbus, Ohio

Introduction: This case reports the first published use of a compartment pressure monitoring device for evaluating orbital pressure in vivo and the potential applications for patient management in cases of suspected orbital compartment syndrome. Case Description: A 22 yo male sustained a gunshot wound to the right periorbital region, was intubated sedated, and could not provide any history or participate with exam. Patient had CT evidence of a retrobulbar hemorrhage. Physical exam was also concerning for a retrobulbar hemorrhage. There was a negative Siedel test, anterior chamber deep/quiet, and dilated exam with vitreous hemorrhage overlying the optic disc, commotio retinae and possible choroidal rupture. A B-Scan did not reveal scleral laceration or retinal detachment, and absence of intra-ocular foreign body. A Compass Compartment Pressure Monitor (Mirado Biomedical, Inc., Seattle, Washington) was inserted into an anatomically safe zone, revealing a pressure of 14 mm Hg. Given the relative normal orbital pressure the decision to perform canthotomy and cantholysis was deferred. The following day the patient’s visual acuity was 20/70 OD, and 20/20 OS, without evidence of sequelae of ocular compartment syndrome. Discussion: This is the first reported case using a compartment pressure monitor, in vivo, to assist in the diagnosis of orbital compartment syndrome. The use of these devices has been shown in cadaveric models, however no gold standard has been developed for in vivo use. Conclusion: The device presents a minimally invasive, quantitative modality that may improve evaluation of patients with suspected orbital compartment syndrome, and may have applications for other orbital space occupying lesions.
**C18**

**Title:** Austrian Syndrome: A Fatal Triad  
**Authors:** Rachel Guthrie, DO (PGY 2); Sean Murney, DO; Kim Jordan, MD  
**Affiliation:** OhioHealth/Riverside Methodist Hospital, Columbus, Ohio

**Introduction:** Austrian Syndrome is the triad of pneumonia, meningitis, and endocarditis caused by invasive Streptococcus pneumonia. Since its first description in 1862, approximately 60 cases have been published that fulfill the diagnostic triad. **Case:** A 50-year-old male smoker with diabetes mellitus and recent cocaine use presented with severe back pain, vomiting, diarrhea, fever, chills, headache, and chest pain. Pneumococcal vaccination status was unknown. On admission he was hypotensive, tachycardic, with temperature of 99.5°F. Nuchal rigidity was present, but no murmur, pulmonary findings, or rash were noted. Initial CRX and head CT were negative for acute process, but LCTB puncture revealed gram-positive diplococci. Blood cultures grew gram-positive cocci in chains within 8 hours. Despite vancomycin and ceftriaxone, the patient’s condition deteriorated. TTE demonstrated findings suspicious for endocarditis, repeat CRX showed bilateral lower lobe infiltrates, and Austrian Syndrome was diagnosed. He developed seizures and repeat brain CT showed an acute infarct. Penicillin-susceptible Streptococcus pneumoniae was identified in both blood and CSF, but he died on hospital day 6 despite aggressive medical management. **Discussion:** Streptococcus pneumonia causes 20–60% of all community-acquired bacterial pneumonia (CAP) in adults, and represents the most common cause of fatal CAP in the elderly. The incidence of pneumococcal endocarditis currently approximates 1–3%, and generally occurs as part of Austrian Syndrome. Risk factors for Austrian Syndrome include alcoholism, splenectomy, IV drug use, and immunosuppression. Prognosis is poor with mortality rates of 30–60%. Conclusion: Pneumococcal vaccination remains important for prevention of invasive pneumococcal disease and Austrian Syndrome.

**C19**

**Title:** Massively Calcified Glioma: A Case Study of a Rare Pathology that also Mimics a Cavernoma  
**Authors:** Byron Holloway, DO (PGY 2); Dennis Rivet, MD  
**Affiliations:** 1Mercy St. Vincent Medical Center, Toledo, Ohio; 2Virginia Commonwealth University Medical Center, Richmond, Virginia

**Introduction:** Massively Calcified Low grade Glioma (MCLGG) as a distinct pathologic entity in children and adolescents, differentiated from both Low Grade Glioma and Plio Glioma based on gross pathologic feature, histochemistry and radiographic findings. However massive calcifications have also been associated with other types of neuro tumors and MCLGG has not yet described elsewhere in the literature so its presentation may not be fully elucidated yet. This case report will further illustrate another way in which MCLGG can present both radiologically and clinically. **Case Report:** Our study focuses on a 22 year old male who was initially referred to Neurology for evaluation of progressively worsening absence seizure type activity with automatisms, where further evaluation localized a temporal lobe lesion. Subsequent MRI showed what was believed to be a right temporal cavernous hemangioma and the patient was referred to Neurosurgery for definitive management. Intraoperatively the tumor was discovered to be massively calcified and final diagnosis was made by pathology with staining and histologic characteristics consistent with a Massively Calcified low grade Glioma. Post operatively the patient’s seizure activity decreased and the patient was seizure free at the 6 month follow up. **Conclusion:** Previous reports of MCLGG have largely differentiated this pathology based on histologic features with little focus on the clinical or radiographic findings while designating it as a pediatric tumor. Based on this presentation we propose that the overall presentation and radiographic finding support a broader definition while including it in the differential with a heterogeneous appearing cavernous hemangioma.

**C20**

**Title:** Thoracic Kyphosis Secondary to Pott’s Disease Leading to Respiratory Distress: A Case Report  
**Author:** Russell W. Hyde, DO (PGY 4)  
**Affiliation:** Western Reserve Hospital, Cuyahoga Falls, Ohio

**Introduction:** Presented is a case of an idiopathic iliac artery rupture thought possible due to a mycotic aneurysm. **Case Description:** A 67 year old male presented to the ED with complaints of LLQ abdominal pain after a golf outing a week ago. Prior to his admission he had been given a course of oral steroids and opioids by his PCP. A CT of the abdomen and pelvis with IV contrast revealed peri-aortic and iliac fluid consistent with ruptured iliac aneurysm or possible ruptured abdominal aortic aneurysm. Further inspection suggested iliac disease and the patient was taken emergently to the vascular suite where angiography confirmed a ruptured right iliac artery and aortic ulceration without evidence of aneurysm. The patient had subsequent endovascular aneurysm repair (EVAR). He remained stable after this, though he did have blood cultures from both before and after the procedure grow staph aureus. There was no clear cause for his bacteremia despite extensive workup. He was discharged to ECF with long term antibiotics, and the cause of his iliac artery rupture remains unknown. **Discussion:** A review of the literature revealed no known case reports of spontaneous iliac artery rupture and no cases of iliac artery rupture due to mycotic aneurysm. As this patient was found to be bacteremic following an endovascular intervention, his treatment is novel. **Conclusion:** More research is needed before meaningful conclusions about this patient’s pathology can be drawn.

**C21**

**Title:** A Rare Case of Eccrine Acrospiroma Transforming Into Metastatic Eccrine Spiradenoma  
**Authors:** Hoda Ilas, DO (PGY 1); Jeffrey Yenchar, MD  
**Affiliation:** Fairfield Medical Center, Lancaster, Ohio

**Introduction:** Eccrine acrospiroma is an infrequent sweat gland tumor that rarely becomes malignant. **Case Description:** This is a case of a 56 year old relatively healthy male electrician who, in April 2009, noticed a chronic bleeding callus on his left thumb. It was treated as an infection until eventual excision. Callus pathology returned as an eccrine acrospiroma. Margins were negative. There was no further treatment. In May 2010, he represented with a 3 month history of enlarging left axillary mass. The mass was surgically excised and pathology returned as a metastatic malignant eccrine spiradenoma. Chest computed tomography demonstrated disease confined to the left axillary region. He was referred to the James Cancer Center where he underwent radiation in July 2010. In December 2010, he had two nodules involving the inner aspect of his left upper arm. Pathology of the excised nodules returned as in-transit metastatic disease. In January 2011, he noticed a recurrent nodule in his left thumb. Core biopsy revealed an aggressive digital papillary adenosccinoma. He was then referred to Memorial Sloan-Kettering Cancer Center. He underwent positron emission tomography scan and thumb magnetic resonance imaging. Both scans were negative for further metastasis. Per the recommendation of Memorial Sloan-Kettering Cancer Center, he underwent partial amputation of left thumb and excision of in-transit metastatic lesions of the left upper arm. He has undergone ten additional surgeries to remove in-transit metastatic lesions. **Conclusion:** This case highlights the need to aggressively treat eccrine acrospiroma and the challenges associated with managing malignant transformation and metastasis.
### C22 Title: A Case of Hypertrophic Obstructive Cardiomyopathy: A Current Review of Pathogenesis, Physiology, Management and Treatment

**Author:** Hoda Ilias, DO (PGY 1); Nasreen Ilias-Khan MD, FACC

**Affiliation:** 1Fairfield Medical Center, Lancaster, Ohio; 2Northwest Cardiovascular Institute, LLP, Oregon

**Introduction:** Hypertrophic cardiomyopathy (HCM) is a genetic cardiac disorder caused by missense mutations in genes that encode cardiac sarcomeres. Penetrance occurs in 1 of every 500 adults in the general population. **Case Description:** This is a case of a 64-year-old male with paranoid schizophrenia, chronic obstructive pulmonary disease, and tobacco dependence with known murmur. He presents due to abnormal echocardiogram that demonstrates severe hypertrophy of the interventricular septum measuring 2.1 cm in thickness with systolic anterior motion of the anterior mitral valve leaflet, and a resting left ventricular outflow tract gradient of 14 mmHg. The patient endorses intermittent dizziness, but denies chest pain, shortness of breath, syncope or other symptoms. On presentation, he was tachycardic and effort was made to rate control with Toprol XL, but was discontinued due to hypotension. He underwent a stress echo to evaluate outflow gradient with exertion which demonstrated severe symptoms, low exercise tolerance and severe outflow obstruction with stress. Due to intolerance to medical management and the potential for psychiatric instability, the patient was referred to HCM clinic to avoid surgical myectomy and determine candidacy for septal ablation or coil embolization. **Conclusion:** This case highlights the algorithm for diagnosis and management of HCM.

### C23 Title: The Development of a Perforated Duodenal Ulcer with Gallbladder Fistula Formation in a Severely Burned Patient

**Author:** Wesley Johnson (PGY 1)

**Introduction:** Stress ulcer formation is known to increase the morbidity and mortality of the significantly burned patient, as demonstrated in this case presentation. **Case Description:** The patient is a 53 yo M admitted to a southwest Ohio regional hospital after sustaining approximately 46% TBSA burns to his left leg, thorax, abdomen, and left arm. The patient suffered the injuries while fixing a kerosene heater that exploded in front of him. He underwent three operations for excision of his burns with allograft, xenograft, and autograft placement. Eight days after the final surgery, he developed chest pain that required evaluation, including a chest CT to rule out a pulmonary embolus, which incidentally revealed free air in the abdomen. After abdominal CT confirmation, the patient underwent exploratory laparotomy with abdominal wash-out and intraoperative EGD. A duodenal ulcer had perforated into the abdomen with fistulization to the gallbladder. No surgical intervention given at that time. The patient was closed without drain placement. **Conclusion:** There are a number of learning points that can be taken from this case, including the incidence and the best prophylaxis against the formation of stress ulcers in seriously burned patients. While in the operating room, should intervention be taken to prevent another perforation into the abdomen/gallbladder? These are only two of the questions I would like to answer as the case continues to develop.

### C24 Title: Hyalinizing Trabecular Tumor of the Thyroid Gland and its Unusual and Unique Histopathology

**Authors:** Dustin Jones (OMS III); Christopher Kieliszak DO, (PGY 3); Christopher Selinsky, DO

**Affiliations:** 1Ohio University Heritage College of Osteopathic Medicine, Athens, Ohio; 2OhioHealth/Doctor’s Hospital, Otolaryngology and Facial Plastic Surgery, Columbus, Ohio

**Introduction:** Hyalinizing Trabecular Tumors are rare follicular derived tumors of the thyroid gland that are infrequently reported in otolaryngology literature. The subsequent case report presents an opportunity to describe the clinical characteristics, discuss treatment modalities and bolster clinician awareness of this rare tumor. **Case Presentation:** A 70-year-old Caucasian female underwent a CT scan of her chest and was incidentally found to have a nodule within the right thyroid lobe. Permanent histological sectioning of the thyroid tissue revealed an encapsulated - circumscribed neoplasm. Slides revealed neoplastic cells with abundant cytoplasm and often surrounded by a trabecular and hyalinizing pattern along with a calcified stroma containing epithelial clusters of Hyalinizing Trabecular Tumor. **Discussion:** Patients presenting with HTT are generally asymptomatic. Size and anatomical location of the tumor influences clinical symptomatology. Histologically, HTT is a follicular derived tumor composed of neoplastic cells arranged in a trabecular pattern with hyalinization and calcification of extracellular material. Distinguishing features of HTT include cellular atypia with a low nuclear: cytoplasmic ratio, cellular aggregates around hyalinized material, and absent or fine chromatin rather than optically clear chromat. Though debated in the literature, the general consensus is that this tumor is a benign entity. **Conclusion:** Currently the diagnostic criterion recommends treating HTT in accordance with PTC and MTC of the thyroid, albeit, the general consensus is that HTT represents a benign follicular neoplasm. It is our hope that additional clinical research will elicit awareness of these rare tumors. Doing so will facilitate updated diagnostic criterion and treatment protocols that could consist of monitoring and follow up opposed to total or near-total thyroidectomy to ameliorate the potential of over-treating patients.

### C25 Title: A Case of Takotsubo Cardiomyopathy: Transient Stress-Induced Systolic Dysfunction

**Author:** Ho-An Kang, DO (PGY 2)

**Affiliation:** Adena Regional Medical Center, Chillicothe, Ohio

**Introduction:** Takotsubo cardiomyopathy is a syndrome characterized by transient left ventricular systolic dysfunction. It is commonly precipitated by acute stressors and is diagnosed in 1-2% of patients presenting with suspected acute coronary syndrome. Incidence is predominantly in postmenopausal women and is increasingly recognized as a clinical entity. **Case Description:** A 55-year-old female with history of HTN, GERD, fibromyalgia presents with 5 days of epigastric discomfort and dyspepsia. The discomfort is described as a persistent dull ache, occurring after moving furniture. No temporal relation with food or positional changes. She experienced dyspepsia with tightness accompanied by nausea. She further affirmed no chest discomfort, no arm or jaw radiation. Workup chest-xray noted cardiomegaly with bibasilar pleural effusions suggestive of CHF exacerbation. EKG NSR 74bpm no ST changes, troponin elevation peak of 0.98 prompting treatment with diuresis, heparin drip, and prompt left-heart catheterization for non-ST elevation myocardial infarction. Left-heart catheterization revealed angiographically normal coronary arteries with severe hypokinesis of apical segments. Echocardiogram confirmed normal systolic dysfunction with EF 25-30%. **Discussion:** Our patient presented with CHF exacerbation and NSTEMI. Her normal coronary arteries and apical ballooning with systolic dysfunction are hallmarks of Takotsubo Cardiomyopathy. While the syndrome is transient and generally reversible, management of complications and close monitoring is needed. **Conclusion:** Our patient was started on low-dose beta blocker, ace inhibitor and CHF guidelines including monitoring daily weights and fluid restriction. Her prognosis is favorable with supportive treatment.
C26 Title: Primary Effusion Lymphoma of the Lung: A Rare Disorder
Author: Frazier L. Keitt, DO, MS (PGY 2); Kim Jordan, MD, FACP
Affiliation: OhioHealth/Riverside Methodist Hospital, Columbus, Ohio

Introduction: Primary effusion lymphoma of the lung (PEL) is a rare lymphoproliferative disease of B-cell origin associated with human herpesvirus 8 (HHV-8). It has been previously termed an AIDS-defining illness, PEL can present in the absence of HIV disease. Case: An 85-year-old Korean male presented to our otolaryngology clinic with a two-week history of intermittent left sided parotid swelling and fullness that began after eating fish for dinner. CT and in-office ultrasound demonstrated the presence of a linear calcification in the parotid. In office diagnostic sialendoscopy revealed that the fishbone was not involving the visualization of main, secondary or tertiary ductal system, and likely lodged in the parotid gland parenchyma. He now has remained symptom free for 6 months since his initial injury. Discussion: The decision to remove foreign bodies should always be one that weighs the risk of foreign body retention against risk associated with the procedure. Unnecessary endoscopic intervention in patients can avoid possible risks associated with sialendoscopy, including gland perforation, nerve or blood vessel injury, ductal avulsion, and infection, especially in the case of acute sialadenitis. If the patient does become symptomatic at any point, the first step in management should be antibiotics. Only if this fails should repeat endoscopy be used to evaluate for potential displacement of the foreign body into the ductal system. Conclusion: We demonstrate that in an asymptomatic patient, foreign body impaction with absence of ductal obstruction on endoscopy can successfully be followed with simple observation.

C28 Title: Analysis of Sebaceous Neoplasms for DNA Mismatch Repair Proteins in Muir-Torre Syndrome
Author: Christopher R. Kieliszak, DO (PGY 3); Arjun Joshi, MD; Amarbir Gill
Affiliations: 1OhioHealth/Doctor’s Hospital, Columbus, Ohio; 2OhioHealth/Riverside Methodist Hospital, Columbus, Ohio

Introduction: Muir-Torre Syndrome is a rare genodermatosis inherited most frequently in an autosomal dominant fashion. Current criteria for the diagnosis of Muir-Torre Syndrome include at least one sebaceous tumor and an underlying visceral malignancy. Muir-Torre Syndrome is strongly associated with a germline mutation in DNA mismatch repair genes. Case Description: We report two patients with a history of colorectal carcinoma who presented with sebaceous neoplasms on the face and trunk. Immunohistochemical staining of the sebaceous neoplasms demonstrated absence of mismatch repair proteins MSH-2 and MSH-6. Genetic studies confirmed deletions in the MSH2 gene and a diagnosis of Lynch syndrome was made. Discussion: Laboratory investigations of patients suspected of having Muir-Torre Syndrome include immunohistochemical staining of biopsy specimens for mismatch repair gene proteins MLH-1 and MSH-2, and genetic testing by polymerase chain reaction analysis of DNA for microsatellite instability. Both immunohistochemistry and polymerase chain reaction were performed in our patients. The utility of immunohistochemistry is presently the subject of debate. Immunohistochemistry can be reliably used as a screening tool to dictate the necessity of further workup of Muir-Torre Syndrome. Conclusion: Immunohistochemical staining for mismatch repair genes, MLH-1, MSH-2, MSH-6 and PMS2 may aid in the diagnosis of Muir-Torre Syndrome in cases where there is high suspicion. Genetic testing is an important final step in the confirmation of Muir-Torre Syndrome.

C30 Title: Giant Splenic Cyst in Third Trimester Pregnancy
Author: Jillian Kurtz, DO (PGY 2); J. Papp, DO; S. Glatz, MD
Affiliation: 1OhioHealth/Doctor’s Hospital, Columbus, Ohio; 2OhioHealth/Riverside Methodist Hospital, Columbus, Ohio

Introduction: Splenic cysts in pregnancy are extremely rare with only 9 cases reported as of 2016. The optimal treatment of this rare condition is not well defined and recommendations are based on retrospective review of limited case studies. The majority of these experiences recommend laparoscopic splenectomy in the 2nd trimester if possible 2. We present a case of a giant splenic cyst presenting in the 39th gestational week of pregnancy. Case: An 18-year-old G1P0 at 39/2 weeks gestation presented to labor and delivery triage complaining of symptoms related to a urinary tract infection (UTI). A renal ultrasound was obtained to assess for hydronephrosis and incidentally revealed a splenic cyst measuring up to 20cm. Maternal Fetal Medicine (MFM) consult obtained and recommended vaginal delivery with care to avoid fundal pressure and decrease likelihood of rupture. When the patient returned to the hospital for induction of labor she was diagnosed with arrest of dilation. A cesarean section with general surgery present was planned. The patient underwent a primary low transverse cesarean section followed by splenectomy. Discussion/Conclusion: The most feared complication of a splenic cyst in pregnancy is a splenic rupture. Sixty percent of ruptures occur in the 3rd trimester. Seventy percent of these are associated with perinatal mortality. Current literature suggests that intervention (laparoscopic splenectomy versus fenestration) should take place in the second trimester to avoid complication. There have not been any cases reported of a giant splenic cyst at 35 weeks and best management practices are yet to be determined.
C31

Title: Ocular Myasthenia Gravis: A Case Study and Clinical Lesson

Authors: Michael Lawless (OMS IV); David Grouse, MD

Affiliations: West Virginia School of Osteopathic Medicine, Lewisburg, West Virginia; Bluefield Regional Medical Center, Bluefield, West Virginia

Introduction: Myasthenia Gravis (MG) is an autoimmune disorder that affects the neuromuscular junction causing weakness in extraocular, bulbar and limb muscles. The disease remains clinically isolated to extraocular muscles in 14-20% of patients; this is referred to as Ocular Myasthenia Gravis (OMG). This case report will review important clinical lessons in the diagnosis and treatment of OMG in hopes of providing further insight into this interesting disease process. Case Description: We report a case of OMG in 66 year old female who presented with intermittent ptosis. An edrophonium test yielded complete resolution of her ptosis. They started her on prednisone and pyridostigmine. Attempt at prednisone taper resulted in relapse of symptoms. They then started her on azathioprine, but she experienced an influenza-like reaction and switched her to mycophenolate. Prednisone was successfully tapered off and her ptosis and diplopia remained in remission on mycophenolate for subsequent two years. Discussion: Early immunosuppressive therapy decreases the conversion rate of OMG to generalized MG.

Azathioprine is a common steroid sparing immunosuppressive agent, however around 11% of the population is heterozygous for loss-of-function mutation of thiopurine methyltransferase which can cause myelotoxicity. Up to 20% of patients started on azathioprine may experience an indiosyncratic influenza like reaction, which occurred in our patient. Conclusion: OMG represents an exciting diagnostic and therapeutic challenge to the savvy clinician. Early incorporation of immunosuppressive therapy may prevent generalization of symptoms. Choice of therapy must be individualized to each patient at to what they can tolerate.

C32

Title: Diagnosis of Systematic Lupus Erythematosus in a Female Presenting with Diffuse Alveolar Hemorrhage

Authors: Andrew MacMillan, DO (PGY 1); Kevin Swiatek, DO; Kim Jordan, MD

Affiliation: OhioHealth/Riverside Methodist Hospital, Columbus, Ohio

Introduction: Diffuse alveolar hemorrhage (DAH) is reported in <2 to 5.4% of patients with SLE, usually in those with an established diagnosis. Case: A 22-year-old Caucasian female with no medical history presented with dyspnea, fever, sinus pain, rhinorrhea, and intermittent facial rash. She was profoundly hypoxic, with pancytopenia, and ESR of 87mm/hr. A CXR showed small bilateral pleural effusions and multifocal pneumonitis. Chest CT revealed bilateral diffuse ground glass opacities and axillary lymphadenopathy. Azithromycin was started for positive Mycoplasma pneumonia IgM antibodies, plus voriconazole for possible disseminated Histoplasmosis. Bone marrow biopsy was normal. Bronchoscopy and lavage were consistent with DAH. Subsequent testing included: ANA >1:320, positive anti-Smith and anti-double stranded DNA, and low C3 and C4. Renal function was normal, with non-nephrotic range proteinuria. SLE with DAH was diagnosed. She improved with azithromycin and high dose solumedrol, and was eventually discharged home on oral prednisone and plaquenil. Discussion: Though autopsies report note alveolar hemorrhage, either focal or diffuse, in up to 66% of SLE cases, DAH as a presenting symptom is uncommon. The classic triad of DAH includes hemoptysis, abrupt fall in hemoglobin, and new pulmonary infiltrates; however, hemoptysis is not always present, as in our case. Pathogenesis includes immune complex deposition in alveolar walls, with small blood vessel injury, leakage, and consequent diffuse hemorrhagic filling process. DAH is associated with significant morbidity and mortality. Treatment includes high-dose steroids, cyclophosphamide, and plasmapheresis in refractory cases. Conclusion: Though rare, DAH may be the initial manifestation in SLE.

C33

Title: Hydromecephalus & Bladder Distention in a Neonate

Author: Amy Maggard, DO (PGY 1)

Affiliation: Palm Beach Consortium for Graduate Medical Education, Palm Beach, Florida

Introduction: Neurogenic bladder in the pediatric patient is most commonly congenital and secondary to spina bifida. However, there are multiple conditions that can cause a neurogenic bladder and various presentations. This case reviews a presentation of bowel obstruction and bilateral hydromecephrosis secondary to neurogenic bladder. Case Description: Patient was a full term male admitted at birth to the NICU for possible posterior urethral valves (PUV) as bilateral hydromecephrosis and bladder distention was detected in utero. Voiding cystourethrogram (VCUG) was performed showing enlarged bladder with no evidence of vesicoureteral reflux or PUV. Indwelling urinary catheter was required to maintain urinary output. Spine US was performed and within normal limits. During NICU stay infant had no bowel movement and began to have bilious emesis following all feeds. Patient was transferred to a university hospital. Rectal biopsy performed was normal. Vescostomy performed. With vescostomy bladder distention decreased, patient began having bowel movements, and tolerated feeds. Diagnosis of neurogenic bladder with bladder distention causing secondary bowel obstruction and colon compression was made. Discussion: While the patient’s in utero presentation was similar to that of PUV there was no evidence of PUV on VCUG. As patient continued with distended bladder and hydromecephalus despite intermittent catheterization a vescostomy was performed. Once the bladder pressure decreased the patient began to tolerate PO intake and began stooling. While no discrete lesion has been identified the diagnosis of neurogenic bladder was made from clinical presentation. Conclusion: The patient will require continued work up and following.

C34

Title: Spontaneous Intracranial Hypotension: A Case Report & Review of Management

Authors: Rudy D. Marciano III, DO (PGY 4); Nicholas Eberly, DO; Chris Karas, MD; Kailash Narayan, MD

Affiliation: OhioHealth/Doctor’s Hospital Neurosurgery, Columbus, Ohio

Introduction: Spontaneous Intracranial Hypotension (SIH) is an uncommon cause of headaches, neck pain and non-specific neurologic complaints. Case Description: 38 year-old male with hypertension and no trauma history presented with 4 days of bilateral occipital headache, neck pain, dizziness, and orthostatic photophobia. Lumbar puncture revealed negative gram stain and culture. Physical examination and CT/CTA of the head/neck were unremarkable. MRI brain revealed pachymeningeal enhancement, venous sinus irregularity, and midbrain sagging. MRI cervical spine revealed epidural fluid collection from C2 to C7. MRI thoracic spine revealed prominent epidural venous plexus. Treatment included blood pressure control, IV hydration, caffeine, and autologous blood patch at L2-3 level. Discussion: SIH is identified via history and physical examination and confirmed with lumbar puncture and/or MRI. Initial treatment is conservative as described above. Refractory or recurrent cases warrant advanced imaging, including CT myelogram, Radioisotope cisternography, or MR myelography and are treated with either epidural blood patch or fibrin sealants directed at the source of CSF egress. Exploratory surgery is reserved for cases refractory to the above methods. Conclusion: Primary care and emergency medicine physicians should include SIH on the differential diagnosis of headaches and be familiar with the initial work-up and management of this disease process. SIH has specific imaging findings on MRI. Conservative treatment is usually adequate, however refractory or recurrent cases require neurosurgical consultation, advanced imaging modalities, and treatments directed at the specific anatomic lesion. Most patients make a full recovery.
C35  Title: Jejunal Diverticulitis: A Rare Complication of Small-bowel Diverticulosis  
Authors: Logan Mellert, DO (PGY 2); Jason Fried, DO  
Affiliation: Western Reserve Hospital, Cuyahoga Falls, Ohio  
Introduction: Small-bowel diverticula are a rare, often asymptomatic. Case Description: An 83 year-old male presented with three days of intractable, generalized abdominal pain. He had no previous abdominal surgeries and unremarkable family/social history. Imaging revealed a 5cm abscess with associated colonic mural thickening near the splenic flexure. On exam, patient had an acute abdomen with peritoneal signs. An emergent exploratory laparotomy revealed a single mid-jejunal diverticula with surrounding inflammation/abscess. Small-bowel resection and reanastomosis was performed. Patient progressed throughout hospitalization and discharged 8 days later. Discussion: Diverticulosis of the small-bowel is a rare clinical finding generally associated with advanced age. Estimated prevalence is 5%. Diverticular disease typically affects the duodenum. Less commonly affected is the jejunum/ileum with a prevalence of 0.3%-1.9%. Unlike congenital disorders affecting the distal ileum, jejunal diverticula are anatomically similar to colonic diverticula. These “false diverticula” result from mucosal herniation through intestinal muscle along the mesenteric border. Rarely symptomatic, small-bowel diverticulosis can be associated with bloating, abdominal pain, and malabsorption; less commonly bleeding, inflammation, perforation, or obstruction. Jejunal diverticulitis is the rarest clinical manifestation with <0.02% reported occurrences. A multicenter study small-bowel diverticular disease in hospitalized patients reported 20% incidence of complications; diverticulitis (70%) and malabsorption (30%) were most common. Diverticula of the jejunum/ileum were more likely to perforate (21% vs. 1.2%) while duodenal diverticula are associated with bleeding (52% vs. 12%). Conclusion: Diverticulitis is a rare complication of jejunal disease.

C36  Title: Case Report of Suspected Austrian Syndrome Following Atrial Ablation  
Authors: Chelsea Nickolson, DO, MBA (PGY 3); Gregory Volk, DO  
Affiliation: Grandview Medical Center, Dayton, Ohio  
Introduction: Austrian syndrome is a rare invasive systemic streptococcal infection compiling pneumonia, endocarditis, and meningitis. Approximately 60 case reports have been documented since it coined its term after Robert Austrian in 1957. The triad has a high mortality and is most prevalent in males in their 5-6th decades of life. Identified risk factors include chronic alcohol use, intravenous drug abuse, diabetes mellitus, splenectomy, and case reports of immunosuppression. Case: 57yo female presented with left-sided weakness, dizziness, and found to have a negative head CT. She decompensated rapidly over the next day requiring intubation for increasing respiratory distress and obtundation. She was initiated on intravenous antibiotics for lobar pneumonia and streptococcal bacteremia. On day 3 of admission, clinical stigmata of endocarditis were observed and left atrial mass was identified on transeosophageal echocardiogram. Head CT showed pattern suggestive of septic emboli. Austrian syndrome was suspected however lumbar puncture was deferred due to elevated risk of procedure without change in imaging. She had clinical demise despite continued intensive medical therapy and deceased shortly after discharge to hospice service. Discussion: Patient had undergone left atrial ablation 31 days prior to presentation for atrial fibrillation, providing a defect in her endocardium to potentially propagate endovascular infection and spread across blood brain barrier. While splenic dysfunction via resection or functional decline has been correlated with development of Austrian Syndrome, perhaps alternate etiologies of decreased ability to fight streptococcal infection should be considered. Conclusion: Austrian syndrome is rare with a poor prognosis. Risk factors present in patients that impede ability to clear streptococcal infection should elevate suspicion of Austrian syndrome in effort for early recognition and intensive medical therapy.

C37  Title: Median Arcuate Ligament Syndrome Presenting with Emphysematous Gastritis  
Author: Andrew Oliver, DO (PGY 4)  
Affiliation: Mercy St. Vincent Medical Center General Surgery Residency, Toledo, Ohio  
Emphysematous gastritis is a rare disease that is described as air within the gastric wall. This disease is more commonly caused by infection of the stomach wall with gas forming bacteria, which can be life threatening due to risk of systemic toxicity. Here we present a case of a patient initially diagnosed with both emphysematous gastritis due to median arcuate ligament syndrome, a syndrome that normally results in transient ischemia to the stomach, which manifests as abdominal pain after eating. There has been a paucity of literature relating emphysematous gastritis to vaso-occlusive disease, less so for median arcuate ligament syndrome. Here we present a case report of a patient that was able to undergo conservative treatment of her emphysematous gastritis during her acute presentation and later undergo median arcuate ligament release for definitive treatment.

C38  Title: Emphysematous Osteomyelitis: A Rare Cause of Intervertebral Gas  
Authors: Juliann Ondecker, DO (PGY 1); Sean Murney, DO; Kim Jordan, MD  
Affiliation: OhioHealth/Riverside Methodist Hospital, Columbus, Ohio  
Introduction: Emphysematous osteomyelitis is a rare disease with mortality rates of 32%. Approximately 40 cases have been previously reported. Case: A 59-year-old female with history of IV drug abuse, hepatitis C, and diabetes mellitus presented with altered mental status. She reported LS-51 discits in 2010. On examination, she was disoriented and writhing in distress. Vital signs were normal, pupils were asymmetric, but the exam was otherwise non-revealing. Studies showed leukocytosis, thrombocytopenia, with CRP 187.7, ESR 37, glucose 653, hemoglobin A1C 16.1 and increased anion gap. Brain CT was normal. Intravenous insulin and fluids were started for DKA. Abdominal CT showed extensive gas in T12 and L1 vertebral bodies with para-spatial gas tracking into the lower mediastinum. Vancomycin and piperacillin-tazobactam were started for suspected emphysematous osteomyelitis confirmed by lumbar spine MRI. Bone biopsy and blood cultures grew Enterobacter cloacae. Her course was complicated by septic shock and prolonged necrophalcopy, but she was eventually discharged to home to complete 4 weeks of oralvofloxacin. Discussion: Intra-osseus gas in the extra-axial skeleton is virtually diagnostic for emphysematous osteomyelitis, though non-infectious causes have traditionally been considered for vertebral intra-osseus gas. Physicians must consider infectious emphysematous vertebral osteomyelitis if vertebral intra-osseus gas is extensive, associated with septicemia, or in presence of adjacent fluid collection(s). Enterobacteriaceae are common infectious organisms. Risk factors include IV drug abuse, spinal surgery, endocarditis, diabetes, and immunocompromised states. Prompt initiation of broad-spectrum antibiotics is crucial and surgical intervention is often required. Conclusion: Emphysematous osteomyelitis requires prompt recognition and treatment for best outcomes.
C39  Title: Acute Right Sided Heart Failure Due to Volume Overload from AV Fistula  
Authors: Michele Parsley (OMS III)1; Denis Nigmatoulline, MD2  
Affiliations: 1Ohio University Heritage College of Osteopathic Medicine, Athens, Ohio, 2Southern Ohio Medical Center, Portsmouth, Ohio  

Introduction: In a patient who presents to hospital with symptoms of right-sided heart failure the most common cause is due to left sided heart failure. Another common cause of right-sided heart failure is elevated pulmonary vascular resistance, either due to COPD, pulmonary hypertension or pulmonary embolism. However, in some rare cases other etiologies must be considered. Case Description: An 81 year old male with a past medical history of coronary artery disease status post coronary artery bypass graft and status post angioplasty and diabetes mellitus type 2 presented to the emergency room with complaints of lower extremity swelling, blistering of his feet and shortness of breath. He was admitted with acute decompensated heart failure and an echocardiogram and a lower extremity arterial duplex was done after admission. The echo demonstrated a right ventricle that moderately to severely dilated with flattening of the septum, which is consistent with RV pressure overload. The lower extremity arterial duplex showed evidence of peripheral artery disease with mild-to-moderate plaques bilaterally and a significant left common femoral artery to left common femoral vein fistula with a high grade flow and velocities reaching nearly 400 cm second. Medical management for fluid overload was started and a covered stent was placed by cardiology over the area of the fistula with improvement of the patient’s symptoms thereafter. Conclusion: Even though an AV fistula is a rare etiology of fluid overload, it should not be excluded. It should be considered in a patient with a consistent clinical picture without any other discernible cause for fluid overload with a significant vascular history.

C40  Title: Reduction of Bilateral Anterior Frontal Sinus Fractures Using a Balloon Sinuplasty Catheter: A Case Report  
Authors: Andrew Petersen, DO (PGY 4)1; Fariha Farid, DO2; Richard Klapchar, DO1; Boris Karanfilov, MD3  
Affiliations: 1Ohio University Heritage College of Osteopathic Medicine, Athens, Ohio; 2Southern Ohio Medical Center, Portsmouth, Ohio  

Introduction: Frontal sinus fractures contribute to 5-15% of all facial fractures and their management deserves special attention due to the risk of short and long-term complications. We report the use of multiple balloon sinuplasty catheters in the correction of bilateral anterior table frontal sinus fractures in a 13-year-old male following sports injury. Case Description: This is a case report about the use of balloon sinuplasty catheters in the reduction of bilateral anterior frontal sinus fractures. We were able to safely reduce frontal sinus fractures using endoscopic techniques, thus preserving sinus mucosa and avoiding the need for frontal sinus obliteration. He was followed for over one year postoperatively without signs of sinus obstruction or other complication. Discussion: Management of frontal sinus fractures continues to be debated today due to the diverse nature of their sequelae. More recently, there has been a trend towards restoration of normal sinus anatomy in place of the previous gold standard of frontal sinus obliteration. Short and long term complications include poor cosmesis, mucocele formation, ostial obstruction, and intracranial complications if the posterior table is involved. The use of balloon sinuplasty catheters to reduce anterior table frontal sinus fractures follows the trend towards sinus preservation described by previous authors and it has the benefit of avoiding larger procedures needed for reduction. Conclusion: In carefully selected patients, balloon sinuplasty catheters may be considered in the management of anterior table frontal sinus fractures with the aim of sinus preservation.

C41  Title: Total Femoral Replacement in a Non-Oncologic Patient: Case Report  
Authors: Gordon Preston, DO (PGY 1); Kristin Cola, DO; Douglas Chonko, DO  
Affiliation: Western Reserve Hospital, Cuyahoga Falls, Ohio  

Introduction: Total Femoral Replacement is a treatment option that is typically reserved for patients that suffer from bone or soft tissue sarcomas which require a wide resection of cancerous tissue before starting chemotherapy. It has also been used as a limb salvage procedure in patients that have recurrent periartrophic fractures, who’s remaining femoral bone stock is so osteoporotic that absolute fixation with customary revision implants cannot be achieved. Obtaining an acceptable reduction and fixation on these fractures presents a complicated challenge to orthopedic surgeons, who may need to resort to total femoral replacement. Case Description: We report one such case of a severely osteoporotic patient that suffers from frequent falls, which resulted in three separate occasions of periartrophic femoral shaft fractures following a total hip arthroplasty. The patient presented with her third non-traumatic fracture of her distal femur that was significantly displaced and unstable. She elected for a Total Femoral Replacement, which was performed without any complications. Discussion: Limb salvage procedures like total femoral replacement offer orthopedic surgeons an alternative to amputation, that allows patients to have pain-free use of their limb. Conclusion: Overall our patient was a good candidate for a total femoral replacement because she fit the indication because she had failed lower limb arthroplasties with inadequate bone stock, complex periartrophic fractures, and had functioning quadriceps extensor mechanism. At one year follow up our patient reported having no complications of infection, instability, or loosening and only reported occasional pain and swelling in the right lower extremity.

C42  Title: Unusual Presentation of Rosacea: A Case Report  
Authors: Sonam Rama, DO, MPH (PGY 1); Dawn Sammons, DO, FAOCD  
Affiliation: OhioHealth/O’Bleness Memorial Hospital, Athens, Ohio  

Introduction: Organs transplant recipients are at an increased risk of developing malignancy. Donor-transmitted tumors are rare. From 1994 – 2001, the US Transplant tumor registry reported 18 donor-related cancers in 108,062 recipients. Case: 66-year-old female with ESRD underwent deceased donor kidney transplant and was placed on appropriate immunosuppression. Her donor died in a motor vehicle accident, and kidneys and liver were transplanted into 3 recipients. Months later, this patient was admitted with abdominal fullness and fever. Original concern was for transplant rejection, but MRI and PET scan revealed multiple lesions in the transplant kidney, bone, and spleen, and a bone marrow biopsy consistent with malignant melanoma. Immunosuppression was discontinued and patient underwent allograft nephrectomy. Vemurafenib and ipilimumab were started with disease regression. The two other recipients died from metastatic melanoma found in the transplanted liver and renal allograft. Discussion: Transplantation for end-stage organ disease has become routine care; studies have called for donor pool expansion to include those with remote history of low-grade skin cancers or remote “cured cancers”. Melanoma cells can remain dormant for decades in immunocompetent patients, only to reactivate after transplantation into an immunosuppressed recipient. Conclusion: Melanoma incidence in the general population is increasing, but whether this will translate into increased incidence of donor-transmitted melanoma and resultant increased mortality remains to be determined. Physicians must not only discuss risks of malignancy with transplant candidates, but also carefully question all donors and their families about recent and remote malignancy, particularly melanoma, given its high transmission rate and mortality.
C43  Title: A Case of Donor-Transmitted Melanoma
Authors: Lakshmi Rangaswamy, DO (PGY 3); Kim Jordan, MD, FACP; Ronald deAndrade, MD
Affiliation: OhioHealth/Riverside Methodist Hospital, Columbus, Ohio

Introduction: Spontaneous subcutaneous emphysema with pneumomediastinum (Hamman’s Syndrome) is an uncommon diagnosis that should be excluded along with more acute pathologies in young patients presenting with chest pain. Case Report: A twenty-year-old Caucasian male presented to the ED complaining of dyspnea and pleuritic chest pain. He admitted to a history of asthma attacks but denied any history of trauma. He was found to be tachycardic with an elevated BP and O2 saturation of 93%. Further examination was significant for pharyngeal erythema, bilateral wheezing, and diffuse subcutaneous emphysema in the neck posterior to the patient’s left clavicle. PA and lateral chest X-rays were obtained, which demonstrated subcutaneous and mediastinal air infiltration. A diagnosis of spontaneous pneumomediastinum with concurrent pneumothorax, likely secondary to asthma-induced barotrauma, was made. A tube thoracostomy was performed to alleviate air infiltration into the patient’s thorax. He was discharged four days later; all symptoms had resolved. Discussion: Hamman’s Syndrome is rare, with an estimated incidence of 0.3% to 5% in children. Adult cases are even more uncommon. Although conservative treatment is a mainstay of therapy, Hamman’s Syndrome with concurrent pneumothorax can be life threatening and may warrant more aggressive intervention. Conclusion: The standard of care for Hamman’s Syndrome with pneumothorax is not well-established, making accurate diagnosis and sound clinical judgment critical components for patient care.

C44  Title: Spinal Epidural Abscess in a Young Female with No Predisposing Factors
Authors: Jennifer S. Reink (OMS IV), Richard Anderson, DO
Affiliations: 1Ohio University Heritage College of Osteopathic Medicine, Athens, Ohio; 2Western Reserve Hospital, Cuyahoga Falls, Ohio

Introduction: Spinal epidural abscess (SEA) is an uncommon condition that may be difficult to diagnose due to varied and unspecific symptomologies. Early signs and symptoms are often difficult to distinguish from other benign causes of back pain. Diagnostic delays may lead to permanent and devastating neurological effects. Case Description: A 27-year-old female presented to the emergency department with chief complaint of worsening lower back and lower extremity pain for greater than one week. She also had concurrent urinary hesitancy for the past 24 hours. Due to continued discomfort and limited mobility following administration of morphine, along with meeting SIRS criteria with no obvious source of infection, an MRI of the lumbar spine was obtained. Evidence of an epidural abscess at L4-L5 with concurrent osteomyelitis was demonstrated on imaging. Discussion: The classic triad of symptoms that characterize SEAs are back pain, fever, and neurologic deficits; however, these are only seen in a minority of patients. There are also many predisposing factors including recent trauma, spinal surgery, immunosuppression, etc., but these too may not always be present. MRI is the imaging modality of choice, with rapid treatment and surgical decompression required for more favorable outcomes. Conclusion: SEA is a rare condition, whose incidence rate has been rising. Although often associated with specific predisposing factors, many patients do not follow the typical presentation. With the most critical factor in preventing devastating neurological effects being early recognition and initiation of treatment, it is important for physicians to be suspicious of potential cases.

C45  Title: Cryptogenic Sepsis: A Presentation of Klebsiella Liver Abscess Syndrome
Authors: David Rudinsky, DO (PGY 2); Chelsey Petz, MD; Kim Jordan, MD
Affiliation: OhioHealth/Riverside Methodist Hospital, Columbus, Ohio

Introduction: Klebsiella liver abscess syndrome (KLAS) is a rare clinical entity presenting as a cryptogenic liver abscess without other GI or biliary infection. Metastatic sites of infection are uncommon, but can occur from Klebsiella pneumoniae with hypermucoid phenotype. Initially isolated to Southeastern Asia, KLAS is now reported in seven other countries. In the US, cases have been limited to coastal cities. We report a case of KLAS diagnosed in an older Taiwanese male in the Midwest. Case: A 65-year-old Taiwanese male with diabetes mellitus and non-alcoholic fatty liver disease presented with fatigue, nausea, and right upper quadrant abdominal pain. Labs showed hyperbilirubinemia, transaminisits, elevated alkaline phosphatase, and thrombocytopenia. His condition rapidly compensated, requiring intubation and vasopressor support. Urine culture grew Klebsiella pneumoniae without documented bacteremia. CT-guided drainage and cultures of a 3.9 cm left hepatic lobe lesion grew K. pneumoniae with positive string test. He received IV ceftriaxone for 32 days, followed by 14 days of oral antibiotics. Discussion: Klebsiella strains with increased virulence are identified in two ways: “string” testing and genotyping. K1 and K2 serotypes phenotypically present with an increased mucoviscous capsule that aids in avoidance of kuepffer cell opsonisation. Risk factors for KLAS include diabetes mellitus, hyperglycemia and hepatic steatosis. Considerable morbidity and mortality are associated with the disease due to its non-specific, insidious presentation. Treatment is similar to other types of pyogenic liver abscesses. Conclusion: KLAS is a rare clinical entity, but should be considered in patients with risk factors presenting with liver abscess.

C46  Title: Sepsis Precipitating Propofol Infusion Syndrome in a 19-Year Old Male: A Case Report
Authors: Olutayo Sogunro, DO (PGY 4); Christine Mikessell, MD
Affiliation: Mercy St. Vincent Medical Center, Toledo, Ohio

Introduction: Propofol Related Infusion Syndrome (PRIS) has been described in the literature with sepsis as a risk factor. PRIS involves acute cardiac failure, rhabdomyolysis, metabolic acidosis, and renal failure in critical patients receiving long term propofol infusions (> 48 hours) at high doses (> 4 mg/kg/hour). The pathophysiology involves an energy imbalance between demand and utilization at the intracellular level. We present a case of a young adult with sepsis who demonstrated signs of PRIS. Case Description: The case involves a 19-year old male involved in a motor vehicle collision who suffered a right femur fracture, diffuse axonal injury (DAI), and later developed pneumonia. On hospital day 7, on 70 mcg/kg/hr of propofol, the patient suddenly became hypotensive, tachycardic, and hyperkalemic (7.8 mmol/L) with EKG changes. He also developed sudden rhabdomyolysis, had cardiac arrhythmias, and had profound metabolic and respiratory acidosis. PRIS was suspected and propofol was discontinued. Cardiac arrhythmias were addressed and intensive resuscitation with intravenous fluids, acute reversal of hyperkalemia with insulin, dextrose, calcium gluconate, bicarbonate, and diuretics was performed. After the acute resuscitation phase, the patient was managed conservatively. He ultimately was discharged on hospital day 22 to a rehabilitation facility. Discussion: We believe sepsis from this patient’s pneumonia caused a pro-inflammatory response that precipitated PRIS. The exaggerated stimulation of inflammatory cytokines led to a hypermetabolic state worsening the energy imbalance at the intracellular level causing organ failure. Conclusion: PRIS is a complex syndrome. It requires prompt recognition in septic patients and critical management of its complications.
C47 Title: A Rare Case of Tension Hepatic Hydrothorax  
Authors: Trace Stafford, DO (PGY 2); Johnna Kern DO (PGY 2)  
Affiliation: Grandview Medical Center, Dayton, Ohio  

Introduction and Description: A 43 year old presented to hospital after being found unresponsive. His past medical history included hepatitis B and polysubstance abuse. On admission, ammonia was elevated at 157. Patient was treated medically and showed clinical improvement. On hospital day 3 patient acutely develop shortness of breath and tachypnea. Stat imaging showed complete white out of left hemithorax with mediastinal deviation. Emergent needle decompression was performed followed by chest tube placement. Patient had >3500mL output from chest tube at which time it was clamped. Fluid studies confirmed that effusion was transudative. Patient improved and was evaluated for TIPS procedure; however he was not a candidate because his MELD score was greater than 24. 3 days post chest tube, patient developed respiratory failure requiring intubation and hepatorenal failure. Despite aggressive measures, patient died on hospital day 8. Discussion: Hepatic hydrothorax is a common complication of end stage liver disease. The common understanding of this is that ascitic fluid travels to the thorax through diaphragmatic defects. The vast majority of cases of hepatic hydrothorax develop on the right. Tension physiology due to hepatic hydrothorax has been theorized, but only one report exists in the literature. Conclusion: This case shows the emergent nature of a rare tension hepatic hydrothorax. Chest tubes are not recommended for treatment of hepatic hydrothorax because of risk of infection, reaccumulation of fluid with continuous draining, and electrolyte and albumin depletion from fluid drainage.

C48 Title: Neurocognitive Decline and Psychosis as Presenting Symptoms of Neurosarcoidosis  
Authors: Paige Sutton (MS III)1; Tom Pitts, MD2; Christopher Scheiner, MD2  
Affiliations: 1Wright State University Boonshoft School of Medicine, Dayton, Ohio; 2Wright State University Department of Neurology, Dayton, Ohio  

The author will describe the importance of considering neurosarcoidosis on the differential for a patient presenting with neuropsychiatric decline and psychosis. This case describes a 43-year-old African American male without history of systemic sarcoidosis. This patient presented with multiple neurological complaints of unknown etiology. The work up initially included laboratory tests and brain imaging. Once neurosarcoidosis was suspected, imaging of the chest was completed. The diagnosis of neurosarcoidosis was confirmed with extraneural biopsy of the hilar lymph nodes, and PET scan showed systemic involvement. The patient was started on Prednisone 20 mg with follow up at a Sarcoidosis clinic. The presenting neurological symptoms of sarcoidosis are often mistaken for more common etiologies including: infectious, demyelinating, neoplastic and connective tissue disorders in the CNS. This case highlights a rare presentation of neurosarcoidosis involving psychiatric symptoms. Early recognition can be critical in preventing complications such as hydrocephalus or increased ICP. Therefore, it is essential for neurologists to consider Neurosarcoidosis in cases of neurocognitive decline and psychosis.

C49 Title: Treatment and Prevention of Migraines in a Patient Using Coq-10: A Case Study Using Integrative Medical Therapies  
Authors: Donald Tait, DO (PGY 3)  
Affiliation: formerly Grandview Medical Center, Dayton, Ohio  

Introduction: Migraines have been described in the medical literature for eons, and is one of the oldest ailments known to mankind; dating back to 1200 BC and continues to the modern era. This case report describes a patient with a history of recurrent migraines, where the combination of integrative and traditional modalities appeared to significantly reduce migraine burden and control her migraine symptoms. Case Presentation: A 31 year old Hispanic female with a remote history of migraines for several years presented to Cassano Family Medicine office for further evaluation and treatment of recurrent migraines. Patient described a recent 2 week recurrence of bilateral frontal headaches. During these new headache episodes, the patient admits to new symptomatology. She admits to having persistent numbness, tingling sensations transmitting down her left arm and left leg with relapsing, remitting episodes of weakness of the involved upper and lower extremities, lasting 5-6 minutes at a time. She was started on 200 mg crystalline free coq-10 (equivalent to coq-10 800mg OTC) and 500mg of magnesium for treatment and prevention of her migraine headaches. After 2 weeks, significant improvements in severity and frequency of her headaches. 12 weeks after treatment was initiated, migraines decreased to 1-2 x per week. Discussion/Conclusion: We hypothesize that the patient’s migraines could be improved with supplementation of coq-10 and magnesium. This case report outlines the integrative medical management of migraines and how utilizing an integrative approach to migraine treatment appears to have demonstrated therapeutic efficacy in this patient.

C50 Title: Resolution of Premature Ovarian Failure in a Patient with Systemic Lupus Erythematosus: A Case Report and Literature Review  
Authors: Katelyn Tondo-Steele (OMS IV)1; Lucy Bucher, DO2  
Affiliations: 1Ohio University Heritage College of Osteopathic Medicine, Athens, Ohio; 2OhioHealth/O’Bleness Hospital, Athens, Ohio  

Introduction: Amenorrhea is common in systemic lupus erythematosus (SLE) and can be associated with disease activity and cyclophosphamide usage. Premature ovarian failure is a known side effect of cyclophosphamide use and can also be caused by autoimmune oophoritis. Case Description: 37 year-old female complained of amenorrhea for nine months at annual exam. The patient has a history of SLE, lupus nephritis, antiphospholipid syndrome, hypothyroidism, seizures, osteopenia and GERD. The patient has a Paraguard IUD. She has a history of cyclophosphamide treatment at initial SLE diagnosis. Physical exam, laboratory evaluation and imaging revealed elevated follicle-stimulating hormone, osteoporosis and ASCUS/HPV positive Pap smear. Approximately one year after onset of amenorrhea she had vaginal bleeding with normalization of FSH. Discussion: This patient meets diagnostic criteria for premature ovarian failure or premature menopause as defined in the prevailing literature. Her case is complicated by multiple autoimmune disorders and a history of gonadotoxic therapies. Conclusion: This case raises awareness of autoimmune oophoritis and cyclophosphamide usage as potential contributing factors to menstrual irregularity in SLE. It highlights complexities in the pathophysiology and diagnosis of premature ovarian failure as well as selection of treatment modalities and goals.
Dextromethorphan/Quinidine Withdrawal Catatonia: A Case Report  

Background: Glutamate antagonists have shown benefit in treating benzodiazepine-resistant catatonia.[1] Catatonia has been reported in context of withdrawal from benzodiazepines. However, withdrawal-emergent catatonia from discontinuation of the glutamate antagonist dextromethorphan/quinidine (DMQ) has not been reported. **Case:** 65-year-old male with schizoaffective disorder and pseudo-bulbar affect was stable on a regimen of risperidone, quetiapine, lorazepam, benzotropine, and DMQ. After being admitted to the hospital with epididymo-orchitis, ciprofloxacin was started while DMQ and lorazepam were held. Within days he developed stupor. Bush Francis Catatonia Scale score was 24. Lorazepam and DMQ were restarted, leading to partial resolution. Completion of ciprofloxacin treatment did not alter the catatonia. **Titrations of DMQ to 20mg/10mg BID lead to progressive sustained improvement in catatonia over several weeks with discharge without catatonia.**

**Discussion:** There is presently one case series of catatonic patients who improved with DMQ treatment.[2] This finding supports that dysfunction in glutamate transmission is involved in catatonia. Dextromethorphan is an NMDA receptor antagonist and a sigma-1 receptor agonist, inhibiting presynaptic glutamate release and postsynaptic glutamate transmission.[3] We speculate that withdrawal from DMQ and lorazepam lead to the development of catatonia. The symptoms continued despite resolution of infection suggesting that catatonia was not solely a result of infection, but is possible that ciprofloxacin, a GABA-antagonist, contributed to the prolonged course. **Conclusion:** Clinicians should be aware of DMQ withdrawal precipitating catatonia. While there is insufficient evidence to recommend DMQ in a treatment algorithm, this case warrants further investigation of DMQ as well as other glutamatergic modulators in catatonia treatment.

Giant GIST Presenting as an Intra-abdominal Abscess and Anemia at a Community Hospital

**Introduction:** Gastrointestinal stromal tumors (GIST) are common GI mesenchymal tumors with an annual United States incidence between 3000-6000. The average tumor size is 3-9cm, and giant GISTs greater than 10cm occur in only 20% of cases. Giant GISTs are associated with high risk of malignancy and recurrence. **Case Description:** 47 year old female presented with a 2 day history of dull lower abdominal pain and 2 week history of chills, fevers and cough. CT abdomen reported a large collection measuring 15cm in the mid-abdomen with thickened, irregular walls and fluid with gas centrally suggestive of abscess. Pertinent labs were hemoglobin of 5.9 and leukocytosis 15.9. Due to extent of the disease, she underwent exploratory laparotomy. An abscess was not found and instead she underwent en bloc resection with anastomosis of a small bowel tumor. Pathology reported GIST Stage IIIA measuring 14cm. Hematology/Oncology recommended adjuvant imatinib.

**Discussion:** The interstitral cells of cajal are involved in GIST tumor formation and activation of c-KIT proto-oncogene is the most common mutation. The stomach is the most common site followed by small bowel, colon, rectum and anus. Small GISTs can be asymptomatic whereas large GISTs can present with obstruction, bleeding, and perforation. IV contrast CT is the diagnostic image of choice. Tumor size, mitotic count and location are considered the most important predictors for prognosis. **Conclusion:** Surgery is the treatment of choice for all GISTs over 2cm. Segmental or wedge resection is done with the goal of obtaining microscopic negative margins. En bloc resection may sometimes be performed in cases of very large GISTs involving adjacent structures. Targeted tyrosine kinase inhibitor use postoperatively has decreased rate of recurrence and increased overall survival.

Acute Appendicitis Unveils an Underlying Appendiceal Adenocarcinoma in the Operating Room: A Case Report

**Introduction:** Primary appendiceal neoplasms are extremely rare and account for only 0.5% of all intestinal neoplasms. Of this small number, appendiceal adenocarcinomas only account for roughly 33% of those cases. **Case Description:** A 59-year-old female presented to the emergency department with a chief complaint of acute lower right quadrant abdominal pain and nausea for 3 days. After a complete physical examination and abdominal computed tomography, her diagnosis was acute appendicitis with associated lymphadenopathy. Her vitals were stable and a laparoscopic appendectomy was scheduled for the following morning. During the laparotomy, the patient was found to have a ruptured appendix and a large palpable cecal mass. Multiple enlarged mesenteric lymph nodes were also appreciated. Due to the suspicious nature, the surgery was converted to an open right hemicolectomy. The specimen was sent to pathology, which revealed a moderately differentiated appendiceal adenocarcinoma. **Discussion:** The most common presentation for appendiceal adenocarcinoma mimics that of acute appendicitis with diagnosis often determined through pathology postoperatively. Less than 20% of appendiceal adenocarcinoma cases are found incidentally during surgeries for any other reason than appendicitis. When this diagnosis is suspected, the most optimal treatment is a right hemicolectomy versus a simple appendectomy. Little research has been conducted on the role of adjuvant chemotherapy or radiation in the treatment of these neoplasms. **Conclusion:** Primary appendiceal adenocarcinomas are extremely rare and because of this, much is still left unknown regarding the disease.
Exhibition
Abstracts
### E1 Title: Integrating Electronic Health Record (EHR) training in Medical Education

**Authors:** Kapil Bajaj\(^1\); Kathy Jefford, CPHIMS, CMPE\(^2\); Rochelle Haynes\(^3\)

**Affiliations:** \(1\)Ohio University Heritage College of Osteopathic Medicine, Athens, Ohio; \(2\)Ohio University College of Health Sciences and Professions, Athens, Ohio

**Introduction:** In the past few years, the integration of Electronic Health Records (EHRs) into the working lives of physicians has become a priority across the United States. In recognizing the magnitude of this shift, Ohio University Heritage College of Medicine has ensured that its students are exposed to, and obtain firsthand experience using EHRs before clinical rotations in the third year. This provides them, not only with the necessary skills needed for successful completion of their graduate education, but also ensures that they become technologically competent and adaptable future physicians.

**Program Design:** A mandatory didactic presentation was presented to third year medical students to provide overview, relevance and significance of EHRs. An instruction sheet was also created for medical students to assist with navigating EHRs. In a simulated patient encounter, medical students were given forty-five minutes to complete a full history and physical (H&P) on a standardized patient (male or female) and thirty minutes to document their H&P findings in AthenaClinicals. Fifteen minutes was also given to the students to present their cases. Completion of the H&P documentation was mandatory for all students; however, students were able to complete optional exercises if time permitted (e.g., vitals, etc.).

**Results:** All students documented and passed the H&P exercise. Analyzed data and reports show that most students documented vitals and additional notes, and found this exercise helpful in improving their confidence with EHRs.

**Conclusion:** Providing medical students with hands-on experience before their clinical rotations will strengthen the core competencies of future physicians.

### E2 Title: Expression of Angiogenic Factors in Myeloid Dendritic Cells Recovered from the Ascites of a Mouse Model of Ovarian Cancer

**Authors:** Fabian Benencia, PhD; Tiffany Loftus; Manindra Singh, BS

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

**Introduction:** The balance between pro- and anti-angiogenic factors maintains the vascular system. A disturbance of this balance leads to the establishment, growth, and survival of cancer cells. Several of these angiogenic factors can be unconventionally secreted through immune cells. Dendritic cells (DCs) are found in peripheral tissues that engulf, and degrade antigens, and express antigenic peptides in the context of major histocompatibility molecules. DCs are activated by cytokines or damaged tissue, resulting in the migration to immunological organs and a specific immune response. Additionally, DCs are associated with diseases like cancer, atherosclerosis, and inflammatory conditions. In some cases, DCs can act in a pathological manner by inducing angiogenesis or immunosuppression.

**Objective:** The objective of this study is to investigate the expression of various angiogenic molecules in DCs present in the microenvironment of ovarian cancer (OC) using a mouse model of OC ascites.

**Methodology:** DCs were isolated from collected ascites; RNA extracted from them and reverse transcribed. Then, the expression of several angiogenic factors analyzed by means of the Polymerase chain reaction (PCR) technique.

**Results:** The results of this study showed that DCs present in the microenvironment of ovarian cancer express several angiogenic factors at the level of RNA.

**Summary/Conclusion:** In conclusion, DCs present in the ascites of OC express angiogenic factors in situ. Thus, even though DCs are conventionally believed to be a keystone in establishing immunosurveillance against tumors, they can also lead to the growth and survival of ovarian cancer by promoting angiogenesis.

### E3 Title: Quality Improvement Instruction in Undergraduate Osteopathic Medical Education Curriculum: Challenges and Prospects

**Authors:** Grace Brannan, PhD; Karen Collins, MPA; Godwin Dogbey, PhD

**Affiliation:** Ohio University Heritage College of Osteopathic Medicine, CORE Research Office, Athens, Ohio

**Background:** Continuous quality improvement and patient safety (QI/PS) are the hallmarks of current health care reforms. Yet, QI/PS is not an integral component of the curricula of many undergraduate medical schools.

**Objective:** Examined curricula of selected osteopathic medical schools for the extent QI/PS was conceptualized and enacted as a body of knowledge.

**Methods:** An IRB approval was sought and obtained. This study used a qualitative, naturalistic enquiry approach to understand the contexts and perspectives holistically. The extant literature was reviewed alongside administrative documents requested from participating institutions. Face-to-face interviews were conducted, transcribed, and analyzed using NVivo 10.

**Results:** QI/PS was not an integral body of knowledge in the curricula of the participating osteopathic colleges. Only few allopathic medical schools even address QI/PS, as gleaned from their websites. There was confusion about QI/PS as efforts in some of the colleges to improve curriculum programming rather than QI/PS as content of the curriculum.

**Conclusion:** Integrating QI/PS into the undergraduate osteopathic medical education was consensually important. Concepts and foundations should be covered in years 1 and 2. The clinical years should continue with the foundations and hands-on experience of QI/PS.

### E4 Title: Cross-Collaboration to Improve Patient Safety in a Small Rural Hospital: Lessons Learned

**Authors:** Grace Brannan, PhD\(^1\); P.J. Divino\(^2\); Godwin Dogbey, PhD\(^1\); Gavin Baumgardner, DO\(^3\)

**Affiliations:** \(1\)Ohio University Heritage College of Osteopathic Medicine, CORE Research Office, Athens, Ohio; \(2\)University at Buffalo, State University of New York, Department of Biomedical Sciences, Buffalo, New York; \(3\)OhioHealth/O’Bleness Hospital, Athens, Ohio

**Background:** Increasing calls for excellent quality of healthcare and patient safety have become hallmarks of current health reforms and policies. These in turn have placed a huge responsibility on hospitals and health systems to ensure that their quality of care and standards of safety of patients are consistent with national guidelines. More importantly, many hospital reimbursements have been currently linked to performance of hospitals based on care quality and patient safety metrics. Consequently, achieving health care quality improvement (QI) and patient safety has been done through process management. Small rural community hospitals do not usually have the resources that bigger and urban hospitals have. In this study, we examined the collaboration among a medical school’s research education office, hospital QI department and leadership, and a pre-medical student. The research education office helped formulate the question, write the proposal, structure the data collection and analysis, and obtain IRB approval. Hospital leadership and the QI department determined the most urgent topic to tackle, provided the clinical processes and structure expertise. The pre-med student collected and summarized the data.

**Challenges:** As with any QI project, the trust of the physicians being observed took a few days to build.

**Successes:** 1. The turnaround time was rapid because the team members were able to address different parts of the study efficiently; 2. The different backgrounds of the team provided a rich perspective; 3. The student had to learn fast and be a very independent worker as the small hospital does not have a large personnel to have a dedicated staff monitoring the student at all times after orientation.
The Sixth Annual Regional Osteopathic Poster Exhibition and Competition

E5 Title: The Biomechanical Effects of the Windmill Softball Pitch: Not as Protective as We Once Thought
Authors: Kristin Cola, DO (PGY 3); Caleb Pinagar, DO (PGY 5); Gregory Hill, DO
Affiliation: Western Reserve Hospital, Cuyahoga Falls, Ohio

The sport of softball has grown exponentially since the passage of Title IX in 1972. Despite the increase in popularity there has been little research done examining the biomechanical effects of the windmill pitch in fast-pitch softball and how it predisposes athletes to injury. The previous thought was that the underhand motion of the fast-pitch was protective due to the shoulder. However an increase in the number of injuries in these athletes has shown this may not be the case. There is abundant literature analyzing the overhand throwing motion in baseball pitchers with rules and regulations put in place by leagues to prevent injury. Baseball leagues have yet to create similar guidelines for their pitchers. While baseball pitchers have strict pitch counts and rarely pitch multiple games in one week, it is not uncommon for a softball pitcher to pitch multiple games in one day. Biomechanical studies have demonstrated the significant forces placed on the body during the windmill pitch. These forces, while experienced during different phases of the pitch, are comparable to those experienced during the overhand baseball pitch. Biomechanically the demands placed on the windmill softball pitcher affect both the upper and lower extremities. The injuries faced by these players are however different than those experienced by their baseball counterparts. Newer research should focus on establishing pitching regulations and rehab protocols to better suit these athletes to prevent injuries and appropriately rehab them when they do occur.

E6 Title: Faculty Development: The Ball Is In Your Court
Authors: Stephen Davis, PhD; Olivia Ojano-Sheehan, PhD; Joyce Jadwin, PsyD
Affiliation: Ohio University Heritage College of Osteopathic Medicine, Office of Faculty Development, Athens, Ohio

Introduction: Most physicians and residents are expected to provide medical education but have never been given the skills and tools to meet that expectation. Given that physicians as a profession recruit, train and police their own, it is imperative to do it well. The OU-HCOM Office of Faculty Development employs three PhD educators dedicated to helping you master the skills needed to do it with excellence. Case Description: There is a plethora of faculty development materials available for free on the Web...but where do I start?, what is best?, what is most important?, who can help?, how do I get what I need?, I know I’m a OU-HCOM Group IV faculty member but what does that really get me? All these questions and more have a GREAT ANSWER! Discussion: While many, even most, of our premier Ohio hospitals are associated with OU-HCOM’s CORE (Centers for Osteopathic Research and Education) few know of the faculty development resources available to them through that relationship. Exposing the resource and partnering with hospital medical education offices should help doctors answer the questions above and find rich resources to identify and satisfy their faculty development needs. Conclusion: A poster outlining the faculty development resources. The poster will then be reproduced and posted in all the OU-HCOM CORE hospital medical education offices to help esteemed educators identify, develop, and hone their medical education skills.

E7 Title: A Chronology of Osteopathic Medicine: Can the DO Remain Distinct in Modern Medicine?
Author: Jennifer Hatfield (OMS III)
Affiliation: Ohio University Heritage College of Osteopathic Medicine, Athens, Ohio

Osteopathic medicine was founded on the basis of manipulation to treat patients. Today, studies show that only 50% of doctors of osteopathic medicine preform manipulation on their patients. In the United States, DOs have changed so much that patients don’t know the difference between DOs and the MDs. In other countries, DO’s have maintained their distinctiveness by only training in manipulation. This has made it difficult for DO’s from the US to be accepted in other countries. In light of the ACGME merger where DO students will be able to train at MD programs, DO distinctiveness is at risk of being lost. Primary care appears to be an area where DO’s can still practice manipulation, but as more DO’s are entering specialty fields they are losing what makes them unique. In order to maintain distinctiveness, DOs need to increase research. This would demonstrate that manipulation is effective and that physicians following Evidence Based medical practices are justified in taking the time to treat their patients.

E8 Title: A One Thousand Unit Mistake
Author: Amber Healy, DO
Affiliation: Ohio University Heritage College of Osteopathic Medicine, Athens, Ohio

Introduction: Medication mistakes are a leading cause of hospitalization and also lead to prolonged hospital stays. Insulin is especially infamous as a high risk medication in terms of safety. Case Description: A 59 year old male with past medical history of type 2 diabetes is admitted to the hospital for community acquired pneumonia. Blood glucose numbers were in the 50s on admission so the patient was placed on an insulin drip. In transition the patient of the insulin drip with Lantus, the patient received 1000 units of insulin instead of 100 units as ordered. Patient was closely monitored once the mistake was realized. His hospital stay was prolonged due to his medication error. Discussion: There are safety checks in place when it comes to medications with higher risk of mistakes. This decreases the likelihood of mistakes but in this case there were multiple reasons that led to the medication error. Sometimes the safety steps are done incompletely with nurses being so busy. A hospital changing from insulin pens to insulin vials within a week and trying to get each nurse trained is not adequate time. Another factor in this case was the medication reconciliation sheet incorrectly listing the insulin concentration. Conclusion: Mistakes are a part of medicine because humans make mistakes and are the ones who deliver care. Even when a medication safety committee examines what they see as every possibility for a mistake, things get missed as was this case with this individual.
E9  Title: Bringing Awareness to Rural Training Tracks: Securing the Future of Rural Medicine  
Author: Andrea Danielle Merry (OMS III)  
Affiliation: Ohio University Heritage College of Osteopathic Medicine, Athens, Ohio  
Introduction: Years of research assessing the rural physician physician shortage has led to successful rural track medical education models. The Rural Training Track (RTT) programs were designed in an effort to alleviate the shortage of rural primary care physicians. RTT programs produce more rural physicians than traditional family medicine residencies. Bringing awareness to RTT programs will aid in their continuing success.  
Objective: The purpose of this literature review is to enlighten the medical public about RTT programs and what they are doing now to ensure their success.  
Methods: The articles were collected through PubMed in January of 2016 using the following search phrases: rural training track, rural residency, rural practice, and rural medical school track. Preference was given to peer-reviewed, rural-oriented articles from the last 6 years with US data.  
Results: There were 40 articles collected, 36 selected. Three were excluded for not addressing rural medicine and one for not including US data. To recruit, RTT programs advertise and offer rural rotations. To train rural physicians, programs have a specific admissions preference, offer assistance, and recognize the need for resilience and specialty training. To retain physicians, offering financial incentives and having early rural and interprofessional training proved better success.  
Conclusion: Enough research has been completed to determine which students will go into rural practice, what makes a medical school produce more rural physicians, and RTT strategies for success. This allows RTT to more correctly recruit physicians who will stay rural. Limitations included small sample size.

E10  Title: A First Look at Unraveling the Mechanisms of TLR3 Involvement in Viral-Induced T1DM in NOD Mice  
Authors: Sarah Metro1; Cecilia Courreges, PhD2; Frank Schwartz, MD3,4; Kelly McCall, PhD3,4.  
Affiliations: Ohio University Heritage College of Osteopathic Medicine, 1Molecular and Cellular Biology Program, 2Department of Biological Sciences, 3Department of Specialty Medicine, 4Diabetes Institute, Athens, Ohio  
Non-obese diabetic (NOD) mice spontaneously develop type 1 diabetes (T1DM) and coxsackievirus B4 (CVB4) accelerates T1DM in these mice when a 'critical threshold' of insulitis is present. This process is driven, in part, by viral triggering of the innate immune receptor, toll-like receptor 3 (TLR3), however the exact role that TLR3 plays in this process is not yet know. Recently, the presence of an immunodominant peptide that shares homology with the CVB4-VP1 protein and with beta-cell-specific autoantigens that regulate beta cell apoptosis were reported in the serum of patients with recent onset T1DM along with autoantibodies that recognize these peptides (diabetes AAs). To unravel the role of TLR3 in viral-induced T1DM, we assessed whether these diabetes AAs were present in NOD mice, if TLR3 was involved in their regulation and if there are differences in severity of insulitis between WT and TLR3 knockout (KO) NOD mice. Specifically, we evaluated (1) the presence and relative abundance of the diabetes AAs in serum collected from WT and TLR3 KO NOD mice using peptide-specific ELISAs, before and up to 2 weeks following CVB4 infection and (2) insulitis in the pancreas of infected and uninfected WT and TLR3 KO NOD mice using insulitis scoring. CVB4-infected TLR3 KO mice had significantly higher levels of diabetes AAs than CVB4-infected WT mice and differences in insulitis of unaffected and infected TLR3 KO and WT mice were also found. Together, these results suggest that these AAs may not be 'diabetogenic', but rather protective in TLR3 KO NOD mice.

E11  Title: Osteopathy around the World  
Author: Ellen Saridakis (OMS III)  
Affiliation: Ohio University Heritage College of Osteopathic Medicine, Athens, Ohio  
Introduction: Osteopathic medicine has a long-standing history in the United States dating back to the 1870s when A.T. Still brought his philosophy to life. Outside of the United States, many countries have practitioners called osteopaths that also work under the same osteopathic philosophy as the United States but lack the freedom to practice as a medical physician.  
Objectives: The purpose of this literature review is to identify which countries recognize the osteopathic profession and compare their work to that of the United States. This review will also recognize what osteopathic physicians and practitioners can do to continue to spread their philosophy further on a global scale.  
Methods: Information was collected from PubMed and Clinical Key databases.  
Results: The literature shows that osteopathy is practiced in many countries. The work of osteopaths in the United Kingdom is a popular form of complementary medicine but lacks medical practice. Italy has taken strides in research, looking to supply more evidence-based knowledge to the field. Canada has opened its doors to osteopathic physicians trained in the United States but lacks their own osteopathic educational institutions. Traditional Chinese medicine recognizes the self-healing mechanism of osteopathy. A continued focus on research and work in developing countries will further spread osteopathy.  
Summary: Around the world, osteopathy is based on the same set of principles but varies on how it is practiced. Collaboration between those who practice in the osteopathic field can further spread the osteopathy to continue its use and growth.

E12  Title: Instituting a Leadership in Patient Safety & Quality Curriculum in a Family Medicine Residency  
Authors: Sandra Snyder DO1,2; Carl Tyler MD, MSc1  
Affiliations: 1Cleveland Clinic Foundation/Fairview Hospital, Family Medicine Residency, Cleveland, Ohio; 2Ohio University Heritage College of Osteopathic Medicine, Athens, Ohio  
Introduction: Resident physicians require explicit training and learning experiences in patient safety, quality improvement, and leadership. Curricula need to evolve in order to address these critical domains.  
Objectives: We present an innovative three-year longitudinal curriculum entitled “Leadership in Patient Safety and Quality.” Our goal is to assure residents develop the core knowledge base and skills necessary to lead Plan-Do-Study-Act quality improvement projects and Root Cause Analysis (RCA) in health care settings.  
Methodology: Residents will complete the Institute for Healthcare Improvement (IHI) on-line curriculum and a self-administered Leadership Practice Inventory (LPI) at the beginning and conclusion of residency. Workshops in the first year will introduce concepts such as teamwork performance, emotional awareness, and personality types. Workshops in the second year will teach relationship and conversational skills. Fundamentals of quality improvement and patient safety will be taught in a case-based format. Residents will participate and lead quality improvement projects during the second and third year of residency. Residents will use the American Academy of Family Practice METRIC or Performance in Practice modules as a frame of reference for their quality improvement project. Each resident will lead a RCA during their third year.  
Results: We are currently in year one of our curriculum. We will outline the content, structure and projected outcomes of our curriculum and present data from our baseline LPIs.  
Summary: Innovative postgraduate curricula are necessary to train physician to be leaders in patient safety and health care quality.