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## Proceedings - Wright State University Boonshoft School of Medicine Eighth Annual Medical Student Research Symposium: Celebrating Medical Student Scholarship

Wright State University Boonshoft School of Medicine Office of Research Affairs

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# PROCEEDINGS

## Wright State University Boonshoft School of Medicine Eighth Annual Medical Student Research Symposium

*Celebrating Medical Student Scholarship*

**April 13, 2016**  
**Gandhi Medical Education Center**  
**White Hall**  
*5:45 – 8:00 PM*



Boonshoft  
School of Medicine  
WRIGHT STATE UNIVERSITY

*Symposium Director:* Ahmed Hawash, Jacob Vincent  
*Associate Symposium Directors:* Larrilyn Yelton, Zach Braunstein, Casey Walk  
*Assistant Symposium Directors:* Jennifer Barbadora, Paul Lang, and Jonathan Bakos  
*Proceedings Editor:* Jacob Vincent

## RESEARCH LEARNING COMMUNITY

The Eighth Annual Medical Student Research Symposium culminates another productive year of academic programming sponsored by the Research Learning Community at Wright State University Boonshoft School of Medicine. The Research Learning Community was developed by the Medical Student Research Club and the BSoM Office of Research Affairs to promote research-related educational opportunities for WSU medical students. Programs supported by the Research Learning Community include the Medical Student Research Club, Medical Student Journal Club, Research Learning Community Lecture Series, and research electives for M1 and M2 students (SMD 616 and SMD 617).

Research Learning Community Home Page  
[medicine.wright.edu/research/research-learning-community](http://medicine.wright.edu/research/research-learning-community)



## 2016 D<sub>ISTINGUISHED</sub> S<sub>CHOLAR</sub> A<sub>WARDS</sub>

The annual Distinguished Scholar award is presented to the fourth year student or students who have demonstrated a continued commitment to medical scholarship. Distinguished Scholars are recognized for generating a significant body of scholarly work, for working collaboratively with students and faculty, for demonstrating leadership in the Research Learning Community, and for advancing student research at the Boonshoft School of Medicine. The Medical Student Research Club is proud to announce the 2016 BSOM Distinguished Scholar Award recipients:

*Kevin Bree, MD*

*Bijan Salari, MD*

*Udit Singhal, MD*



# ABSTRACTS

(In Alphabetical Order by Presenting Author)

## Clinicopathologic Predictors in Advanced Head and Neck Cancer

Ali Bukhari, MD; Keegan Bakos; Eric Erb

*Presenting Author:* Keegan Bakos; Eric Erb

*Faculty Mentor:* Ali Bukhari, M.D.

*Mentor's Department:* Internal Medicine

*Poster Number:* 4 **\*\*Digital Presentation\*\***

**Research Question/ Objective:** The goal of this study is to evaluate the effect of various clinical and pathologic risk factors on treatment outcomes among patients who undergo surgery followed by adjuvant chemo radiation therapy in head and neck squamous cell carcinoma. Objective 1: To evaluate the effect of time interval between surgery and the initiation of adjuvant concurrent chemo radiation therapy of patients with head and neck squamous cell carcinoma who are candidate for tri-modality therapy on recurrence of disease and overall survival. Objective 2: To evaluate the effect of time interval between surgery and the completion of adjuvant concurrent chemo radiation therapy of patients with head and neck squamous cell carcinoma who are candidate for tri-modality therapy on recurrence of disease and overall survival.

**Background:** In 2004 two groundbreaking studies (Cooper JS, Pajak TF, Forastiere AA, et al) and (Bernier J, Dometge C, Ozsahin M, et al.) set a new standard of care for patients who presented with high risk head and neck squamous cell carcinoma. High-risk individuals were identified as having qualities such as histologic evidence of invasion of two or more regional lymph nodes, extracapsular extension of nodal disease, positive resection margins, and perineural involvement among others. Observed benefits included improved locoregional control for combined adjuvant chemoradiation over adjuvant radiotherapy-only following surgical resection. In the Cooper JS, Pajak TF, Forastiere AA, et al. trial, two-year locoregional control rates were 82% in the chemoradiation group vs 72% in the radiotherapy-only group ( $p=0.01$ ).<sup>1</sup> Moreover, the Bernier J, Dometge C, Ozsahin M, et al. trial demonstrated

continued locoregional control with five-year rates of 82% in the dual-therapy group vs 69% in the radiation-only group ( $p=0.007$ ). The Bernier J, Dometge C, Ozsahin M, et al. trial went on to illustrate increased progression free survival (PFS) and overall survival (OS) in the chemoradiation group (hazard ratio 0.75,  $p=0.02$  and hazard ratio 0.90,  $p=0.04$ ; respectively). While combined adjuvant chemoradiation is now the standard of care in advanced SCCHN, there exists a paucity of data regarding optimal time to combined adjuvant therapy and outcomes. Optimal time to adjuvant chemotherapy following operative procedures have all been assessed in a variety of malignancies including breast, colon, and lung cancer with mixed results: Two large meta-analyses demonstrated significant decreases in both overall survival (OS) and disease free survival (DFS) for breast cancer and colorectal cancer. Breast cancer patients had an OS HR 1.06 (95% CI 1.02-1.10) and DFS HR 1.08 (95% CI 1.03-1.14) for each four-week period following surgical resection. Similarly, patients in the colorectal cancer meta-analyses reported even more significant results with an OS HR 1.12 (95% CI 1.09-1.15) and DFS HR 1.15 (95% CI 1.11-1.20) for each four-week period. Conversely, Booth et al, utilizing the Ontario Cancer Registry for all patients diagnosed with NSCLC from 2004 to 2006, found no increased mortality in patients with delayed time to adjuvant chemotherapy, defined here as greater than 10 weeks (4-year overall survival for patients receiving adjuvant chemotherapy in weeks 1-10 weeks following surgery vs those receiving weeks 11-16: 64% vs 61%,  $P = 0.758$ ). A number of studies exist in the literature that demonstrate improved outcomes associated with shorter treatment delivery times in SCCHN patients. Hinerman et al observed a trend towards higher locoregional failure in high-risk SCCHN patients when stratified by duration between surgical resection and initiation of radiotherapy. Moreover, there was also a trend towards higher locoregional failure in these patients when overall treatment time, as defined by surgery date to last day of radiation, was greater than 101 days. However, unlike our proposed study, these patients did not



receive concurrent adjuvant chemotherapy as is the standard of care today. Rosenthal et al found similar results demonstrating improved locoregional control and overall survival ( $p=0.022$  and  $p=0.035$ ) in high-risk patients receiving adjuvant radiotherapy without systemic chemotherapy stratified by total treatment time less than 100 days.

**Methods:** 5.0 DATA ANALYSIS. 5.1 Analyses Methods This is a retrospective study (chart review) on patients with head and neck squamous cell carcinoma diagnosed between 1990 and 2010 who received any postoperative adjuvant chemoradiation. Cox proportional hazards model will be used to describe any association between TTAC and survival. Primary outcomes of interest will include OS and locoregional control with emphasis on initiation of treatment. Secondary outcomes based on the first endpoint will extend to include OS and locoregional control against total treatment time to completion of therapy. The primary goals of this study are to demonstrate an optimal time to adjuvant chemotherapy in head and neck squamous cell carcinoma patients who qualify for tri-modality treatment. **Results:** While our project is IRB approved, we are still awaiting chart access to the VA. Based on our literature reviews for the background of this project, we are expecting to see a difference in the OS and locoregional control based on timing to adjuvant chemotherapy and completion of adjuvant chemotherapy. We hope to get results out of this study that further aid physicians in establishing a protocol of treatment for patients with high risk SSHNC. We also hope, with our findings, to prevent unneeded treatment to patients that may be detrimental to their health. **Conclusion:** Future Plans: Once we complete the main objectives of our project, we have a few other ideas we may explore in the future. To evaluate effect of pre- and post-FDG values on recurrence of disease in patients with head and neck squamous cell carcinoma. To evaluate effect of hematologic toxicity on recurrence of disease in patients with head and neck squamous cell carcinoma.

### **Health Information Seeking Among Pediatric Cancer Patients and Their Parents**

Colleen Begley; Andrea Frazier; Larrilyn Yelton; Mukund Dole, MD; Ayman El Sheikh, MD; Jordan Wright, MD; Adrienne Stolfi, MSPH; Shalini Forbis, MD, MPH

*Presenting Author:* Colleen Begley; Andrea Frazier; Larrilyn Yelton

*Faculty Mentor:* Adrienne Stolfi, MSPH

*Mentor's Department:* Biostatistics, Pediatrics

*Poster Number:* 51

**Research Question/Objective:** Identify differences in health information seeking and usage among demographics and between adolescent oncology patients and parents of pediatric oncology patients; determine adolescents' and parents' opinions of various health information sources.

**Background:** A cancer diagnosis in a child leads to multiple health information needs. Parents need to make important, informed decisions quickly and learn to manage medications, infection risk and medical devices. Parents of chronically ill children have reported feeling overwhelmed with information and desire to meet regularly with their medical teams to discuss their child's diagnosis. Parents may join online support groups seeking health information, practical advice or emotional support. In addition, adolescent oncology patients have reported feeling unempowered to make decisions about their care, even though they may be reaching legal age. To our knowledge, this is the first quantitative study addressing the health information needs of both adolescent cancer patients and parents of pediatric cancer patients.

**Methods:** Parents of pediatric oncology patients, and adolescent oncology patients aged 12 years and older, were asked to complete similar but separate surveys about their health information needs at an urban community referral center in Dayton, Ohio. The surveys assessed information needs at different stages of diagnosis and treatment, perceived helpfulness and trustworthiness of varied information sources, and examined self-reported use of the internet for health information. Comparisons between parents and adolescents were made with chi-square or Fisher's exact tests.

**Results:** Thirty-eight parents and 15 adolescents completed the survey. Overall, parents and adolescents reported similar health information needs and habits, except that teens were less likely than parents to have read a book about their disease (13% vs. 63%,  $p=0.001$ ). All participants rated their oncologist as their most important source for medical information; written responses cited experience and specialized knowledge. Other parents/patients (38%) were the most popular

source for non-medical information, followed by the oncologist (29%) and oncology nurses (26%), with no significant difference between patients and parents ( $p=0.658$ ). Adolescents were less likely than parents to rate their oncologist ( $p=0.005$ ), other patients (in person:  $p=0.001$ ; online:  $p=0.010$ ), and informational internet sites ( $p=0.047$ ) as understandable; they were also less likely to rate communication with other patients in person or online, and books, as helpful ( $p=0.009$ ,  $0.024$ ,  $0.001$ ) or trustworthy ( $p=0.017$ ,  $0.002$ ,  $0.028$ ). **Conclusion:** Further research is needed with an expanded population, as our small sample may not have revealed all significant differences between patients and parents, and our survey was only available in a written, English-language format. However, the health information trends we have identified will be helpful to pediatric oncology teams. Oncologists and nurses can be reassured that patients and their families value their medical opinion and experience. Parents' reliance on other parents for non-medical information affirms the positive value of support groups. Furthermore, educational interventions could be tailored to the needs of patients and their families: more time could be spent on verbal education with adolescents, while parents were open to and relied on more varied sources of information.

### **Assessing Humility in Medical Students: Third-year Medical Students and the I Don't Know Option**

Kevin Bree; Adrienne Stolfi MSPH; Ryan Mast DO, MBA; Brenda Roman MD

*Presenting Author:* Kevin Bree

*Faculty Mentor:* Brenda Roman, MD

*Mentor's Department:* Academic Affairs

*Poster Number:* 26

**Research Question/Objective:** When given the option of "I Don't Know" (IDK) during the Individual Readiness Assurance Test (IRAT) portion of a Team-Based Learning (TBL) exercise, do third-year medical students choose IDK more often than they choose an incorrect answer?

**Background:** Professional values, such as empathy, of medical students weaken over time, by a process of moral "erosion." In addition, an immense workload and pressure may cause medical students to lose their humility. Lack of humility

could be a contributor to moral erosion and may lead to misdiagnosis, improper or unethical communication, and contribute to medical error. Our previous studies in first-year medical students show improvement in scores occurred by selecting fewer wrong answers when students were given an "I Don't Know" option on multiple choice tests.

**Methods:** Sixty-two third-year medical students in their Psychiatry clerkship were given two versions (A and B) of a Team-Based Learning Individual Readiness Assurance Test (IRAT) four times during the clerkship. There was an additional option of IDK on IRAT B. The IRATs were scored with 1 point for a correct answer, 0 points for an incorrect answer, and 0.5 points for a response of IDK. In addition, the students were given a survey at the beginning and end of the clerkship with questions about the use of IDK. The study was exempted by the WSU Institutional Review Board. **Results:** A student's score decreased an average of 1.4 points when given the option of IDK. On average, students selected a right answer 3.6 fewer times and a wrong answer 2.2 fewer times when presented with an IDK option. The average student selected IDK 2.5 more times than they selected a wrong answer.

**Conclusion:** Students are comfortable saying IDK in a multiple choice setting. However, use of the IDK option in clinical evaluations (OSCEs) is warranted to determine the effectiveness of the IDK option in the clinical environment. This study was limited by the fact that no validated measure for humility existed so the authors created their own. In addition, some students may be more confident than others or may attempt to "game" the system to get a better score. More data analysis needs to be done to determine if students switched more wrong answers or more correct answers to IDK. Most students were comfortable saying IDK to another student or faculty member and a majority agree that a physician must be comfortable with saying IDK. However, thoughts on whether the IDK option should be implemented into the medical curriculum were mixed.

## Acute Pancreatitis as a Complication of Transarterial Chemoembolization of Hepatocellular Cancer – Case Report and Review of Literature

Matthew Brown; Padmini Krishnamurthy, MD; Sangeeta Agrawal, MD; Robert F Short MD, PhD

*Presenting Author:* Matthew Brown

*Faculty Mentor:* Sangeeta Agrawal, MD

*Mentor's Department:* Gastroenterology

*Poster Number:* 37

**Research Question/ Objective:** Transarterial Chemoembolization (TACE) is a therapeutic procedure often performed for hepatocellular carcinoma (HCC). Local complications, though generally uncommon, can arise from arterial ischemia and local cytotoxicity from the chemotherapeutic delivery. We present a case of acute pancreatitis as a rare complication of the TACE procedure along with a review of literature of this uncommon adverse effect. **Background:** Hepatocellular carcinoma (HCC) is the fifth most common malignancy in the world and the leading cause of cancer-related deaths worldwide (1, 2). Prognosis is typically poor because many patients are burdened with unresectable tumors (3). Well differentiated HCC is mostly dependent on the hepatic artery for blood supply and it is through this characteristic that arterial chemoembolization (TACE) procedure is used as an effective therapeutic treatment for HCC. The procedure is performed by injecting drug eluting beads loaded with chemotherapy agent into the vasculature supplying the HCC which serves a dual purpose of blocking the blood supply and targeted delivery of the chemotherapeutic agent to the tumor. Complications of TACE can result from inadvertent embolization of arteries supplying the liver, gallbladder, stomach and pancreas. Here we present a patient with HCC who developed a rare complication of acute pancreatitis following TACE procedure, likely owing to his variant arterial anatomy. **Case Presentation:** A 65-year-old Caucasian male with history of chronic hepatitis C and cirrhosis was diagnosed with multifocal HCC with a dominant lesion in the medial left lobe of the liver. TACE was performed via the right transfemoral approach. Aortogram, superior mesenteric arteriogram and celiac artery injections were performed. Celiac arteriogram and subsequent selective arteriogram of the common hepatic artery

showed variant arterial anatomy with the middle hepatic artery arising directly from the gastroduodenal artery in close proximity to the origin of the superior pancreatic artery (figure 1). Super selective catheterization of the middle hepatic artery (supplying the medial segment of left hepatic lobe) was performed and this was found to be supplying the suspected lesion (figure 2). Embolization was carried using 70-150 microns microsphere beads (LC Bead M1, BTG, West Conshohocken, PA) loaded with 50mg of doxorubicin and lipiodol. Subsequently, the lateral segment of left hepatic artery and the right hepatic artery were also embolized using 100-300 microns beads loaded with 50mg of doxorubicin along with 3mL of lipiodol (Guebert, Bloomington, IN). The patient was administered prophylactic antibiotics including cefazolin and metronidazole in the immediate pre and post procedure period per protocol. Patient developed significant epigastric pain within 24 hours of TACE procedure. His CBC showed an elevated WBC count of 15.4 t/cmm. Serum amylase and lipase levels were 400 U/L (ref: 28-100) and 3809 U/L (ref: 73-383 U/L) respectively. His liver function tests showed moderate elevation of serum AST and ALT at 314 IU/L (ref: 9-14 IU/L) and 168 IU/L (ref: 17-63 IU/L) respectively. Serum alkaline phosphatase and total bilirubin were normal. His right upper quadrant ultrasound did not show gallstones or biliary dilation. Computer tomography scan of the abdomen performed without contrast showed new finding of enlarged head of the pancreas with peri-pancreatic fat stranding consistent with acute pancreatitis (figure 3). A diagnosis of TACE induced mild acute pancreatitis was made and patient was treated conservatively. His course of hospitalization was uneventful and he was discharged 72 hours later, in a stable condition. He appeared well 4 weeks after discharge, without further complications of acute pancreatitis. He was subsequently treated again 5 months later to the same artery with the same reagents but utilizing a special microcatheter designed to act as a one way valve during bead delivery to prevent reflux (Surefire Medical, Westminster, CO). The patient tolerated this procedure well and was discharged the next day without any signs of complication. **Discussion:** TACE is a common procedure used to treat patients with non-resectable HCC. The therapeutic effect is based on the differential

arterial supply of HCC by the hepatic artery and the liver parenchyma which is supplied >70% by the portal vein. The intra-abdominal portion of aorta most commonly gives rise to three main anteriorly directed branches before its bifurcation. They include the celiac artery (CA), superior mesenteric artery (SMA) and the inferior mesenteric artery (IMA). TACE is used to super-selectively block the arterial supply of the tumor without deleterious effect on rest of the liver. Drug eluting beads coated with doxorubicin is the most common chemotherapeutic agent used for chemo-embolization. It is imperative for interventional radiologists involved in performing TACE be aware of the anatomical variation of the hepatic arterial circulation to prevent inadvertent embolization and complications. Michael classification is one the earliest classification of the hepatic arterial variations based on study of 200 cadavers. Recently, Binit Sureka et al conducted a retrospective study of 600 subjects to study the variations in hepatic arterial circulation using multidetector CT scan (MDCT) (4). Normal celiac axis anatomy consisting of the three branches, namely, common hepatic artery (CHA), splenic artery (SA) and left gastric artery (LGA) called the hepatogastrosplenic trunk was seen in 91% of cases. Most common anatomical variations in the decreasing order of frequency included hepatosplenic trunk with separate origin of LGA from aorta, gastrosplenic trunk with separate origin of CHA from aorta and the gastrosplenic trunk with a hepatomesenteric trunk arising from the aorta. Unusual variations of CHA included origin from SMA or aorta in less than 5% of cases. Right hepatic artery (RHA) originated from hepatic artery proper (HAP) in 80% and less commonly from SMA, CA or aorta. Left hepatic artery (LHA) originated from HAP in more than 80% of cases and less commonly from LGA or the aorta. Middle hepatic artery (MHA) which usually supplies segment 4 of the liver originates from RHA in 41%, LHA in 28%, CHA in 4.5% of cases and rarely from an accessory hepatic artery with inability to define the origin in 26% of cases. Gastroduodenal artery (GDA) originated from CHA in almost 98% of the cases and unusually directly from celiac axis or the distally from RHA or the LHA when there is no CHA. Other variations of CHA include trifurcations and quadrifurcation instead of bifurcation. Acute pancreatitis is a rare

complication of TACE. The proposed mechanism involves regurgitation of the embolic beads from the hepatic artery into an artery supplying the pancreas, especially the gastroduodenal artery (5), resulting in ischemia of the pancreas. It is important to note that the head of the pancreas is particularly susceptible to ischemic injury since the arteries supplying it (pancreaticoduodenal arcades anterior and posterior) are terminal arteries. The rest of the pancreas, which is richly supplied by branches of SMA, is rarely the primary site of injury (5). The incidence of acute pancreatitis following TACE ranges from 1.7% to 15.2% (5, 6). Acute pancreatitis can develop within 24 hours to up to 15 days after TACE procedure (7, 8). The severity can range from mild (5) to necrotizing pancreatitis (7-13). In the largest study by Lopez et al, evaluating risk factors for acute pancreatitis following liver embolization (bland or chemotherapeutic), volume of embolic microspheres and use of carboplatin were most significantly associated with TACE induced pancreatitis (5). Carboplatin, when given systemically has also been associated with acute pancreatitis (14). Anatomical variations of hepatic artery or arterio-venous fistulae, size of microspheres or use of lipiodol, were not associated with post TACE acute pancreatitis. Although prior authors have stated anatomic variation is not necessarily associated with pancreatitis following TACE, it is likely that specific variation presented here is so rare that it would be difficult to have a study that was powered to truly detect whether anatomic variations had a significant impact on pancreatitis post-TACE. In that study, however, it does point out that volume administered did have association with pancreatitis (14). It stands to reason that larger volumes administered lead to increased stasis in the target artery and thus increased likelihood of reflux of embolic material with resultant non-target embolization. Non-target embolization of pancreatic arterial supply is the likely culprit for pancreatitis, regardless of anatomy. In our case, a reasonable conjecture is that the close proximity of the superior pancreaticoduodenal artery to the target artery makes even a small amount of reflux a risky proposition. As with every case, embolization was carried out under direct visualization watching for stasis in of flow in the artery and stopping before any reflux was identified. It seems likely, though,

that a small amount of material refluxed undetected. Even a small amount of reflux when combined with the anatomic variant could have contributed to the development of pancreatitis. The most common adverse effect of TACE is post-embolization syndrome and occurs in 60-80% of patients (15). This comprises symptoms of abdominal pain, fever and ileus as a result of local cytotoxicity and tumor ischemia. Other complications include acute cholecystitis (6), and tumor rupture (16). As most of these complications present with post procedure abdominal pain, laboratory investigations and further imaging is often necessary to determine the etiology of the abdominal pain. Long term complications of TACE include gastric ulcer (15), liver abscess (17) and biliary strictures (18,19). Rarely, arterio-venous shunts result in systemic complications including pulmonary embolization (3) and contrast induced acute renal failure (20). In a study by Jinglin Xia et al., the total incidence of a severe complication from TACE of the liver was 2.68% (3). Obtaining a good arteriogram and identification of anatomical variations and arterio-venous shunts combined with targeted chemo-embolization may avoid most of TACE induced complications. **Clinical Relevance:** We report a case of acute pancreatitis that developed as a complication of TACE procedure that was performed for HCC. Even though, a super selective catheterization of the middle hepatic artery supplying the tumor in the medial left lobe was achieved, the anatomical variation of this artery arising directly from the gastroduodenal artery, instead of from the proper hepatic artery, may have resulted in reflux of the embolic beads into the gastroduodenal artery and acute pancreatitis.

### **Physician Approaches to Autism Spectrum Disorder**

Katherine Bruening; Adrienne Stolfi; Shalini Forbis, MD, MPH; Craig Boreman, MD

*Presenting Author:* Katherine Bruening

*Faculty Mentor:* Craig Boreman, MD

*Mentor's Department:* Pediatrics

*Poster Number:* 53

**Research Question/ Objective:** To understand primary care practice approaches, knowledge, and educational needs regarding autistic disorders to

help optimize earlier diagnosis and access of resources. **Background:** 1 in 68 children meet diagnostic criteria for autism spectrum disorder (ASD). The median age of diagnosis is approximately 4 years with current screening practices. However, most children have obvious symptoms of ASD by age 3. Current screening recommendations for ASD at 18 and 24 months have only C-level evidence rating and recent studies suggest a multimodal diagnostic approach may be more effective. Literature has shown experts are most accurate in diagnosing ASD, suggesting that a close partnership between generalists and specialists will create a more efficient and effective screening and diagnostic method. **Methods:** This study utilizes an exploratory survey to evaluate local providers' approaches to the management of ASD. A 30-question survey was distributed electronically to local physicians associated with Dayton Children's Hospital. The survey was anonymous and divided into three sections (A, B, C) looking at demographics, general practice patterns, and True/False knowledge questions, respectively. Preliminary analyses of associations between demographics, practice patterns, and knowledge included Pearson correlations and one-way analysis of variance. **Results:** Of the 325 physicians who received the survey, 41 responded to date. On the knowledge portion of the survey the mean $\pm$ SD score was 82 $\pm$ 8 (range 60-100). There were no differences in scores by physician age, gender, or year of residency completion, but years in current practice location was positively correlated with test score ( $r=0.32$ ,  $p=0.044$ ). 68.3% of responders routinely screen for autism, of which 53.6% use the M-CHAT while 25.1% used the M-CHAT with additional testing. With a failed screen, responders referred to a specialist (51.2%), did closer follow-up (31.7)% and/or redid the screen (7.3%). Most of the responders (80.5%) felt more educational programs are needed regarding Developmental/ASD, which was not significantly associated with knowledge test score ( $p=0.231$ ). **Conclusion:** Pediatric physicians have a good understanding of the management of ASD overall as evidenced by lack of statistical significance regarding gender, age, practice demographics, and knowledge score. However, our sample size is small, which may have limited our ability to detect associations. There appears to be a strong need for

more resources and awareness of existing resources for individuals with ASD in the community. Finally, the population surveyed included pediatric specialists, who do not routinely screen for autism, making several questions in the survey less relevant to their daily practice. Future studies may be done to address these areas by implementing ways of improving response rate and focusing distribution of questionnaire to primary care providers.

#### **Effects of High-Fidelity Simulation on Student Perceptions of Interprofessional Education.**

Karissa Chow; Trevor Stump, Mckenzie Shenk; Becky Brown

*Presenting Author:* Karissa Chow

*Faculty Mentor:* Raymond Ten Eyck, MD

*Mentor's Department:* Emergency Medicine

*Poster Number:* 57

**Research Question/ Objective:** Assess the change in healthcare students' perceptions of interprofessional education following a high-fidelity emergency medicine simulation. **Background:** Interprofessional education is gaining momentum in healthcare education through the accreditation standards for various health professions and requirements from government initiatives like the Affordable Care Act. The role of high-fidelity simulation in healthcare education is growing and serves as a mechanism to implement interprofessional education. **Methods:** Students from a medical, nursing, and pharmacy school participate in a high fidelity simulation lab. A validated survey will be administered before and after the high fidelity simulation lab. **Results:** We anticipate that the high-fidelity simulation will improve student perceptions of interdisciplinary education in three factors: interprofessional teamwork and team-based practice, roles and responsibilities for collaborative practice, and patient outcomes from collaborative practice. **Conclusion:** High-fidelity simulation provides a means to improve interdisciplinary education perceptions among healthcare students.

#### **Helicopter Scene Response for Stroke Patients: The Five Year Experience of an Air Medical Program**

Bonnie Chow; Matthew Huang; Andrew Hawk, MD; Catherine Marco, MD

*Presenting Author:* Bonnie Chow

*Faculty Mentor:* Catherine Marco, MD; Andrew Hawk, MD

*Mentor's Department:* Emergency Medicine

*Poster Number:* 58

**Research Question/ Objective:** The purpose of this study was to examine the utility of an EMS-requested air medical helicopter responding directly to the scene for a patient with clinical evidence of an ischemic CVA and direct transport to a regional referral hospital that provides comprehensive CVA care. **Background:** The CDC estimates more than 795,000 people in the United States have a stroke annually. Furthermore, approximately 64 million US adults have had a stroke in their lifetime. The magnitude of this disease demands safe, accessible, time-efficient, and cost-effective means to identify and transport CVA patients to definitive care centers. **Methods:** A retrospective chart review was completed for all CareFlight CVA scene flights for five years (2011 - 2015). All patients were adult and transported directly to Miami Valley Hospital (MVH). EMS criteria includes CVA symptom presence for less than three hours or awoke abnormal (expanded from less than two hours only of symptoms in 2011 - 2012), non-hypoglycemia, and the presence of a significantly positive Cincinnati Pre-hospital Stroke Scale. **Results:** During the five years studied (2011-2015), 136 "Stroke Alert" patients were transported from the scene by helicopter. The mean age was 67.6 ( $\pm 15.7$ ) with a median age of 72. Seventy patients were male (51.5%). The majority of the patients (N = 102; 74.3%) met all three EMS guideline criteria for requesting a helicopter to the scene for stroke. The mean National Institute of Health Stroke Score (NIHSS) on hospital arrival was 9.4 ( $\pm 8.1$ ). Peripheral tPA was administered to a total of 28 patients (20.6%). A neurointerventional procedure including endovascular therapy was utilized in 10 patients (7.4%). When all three EMS triage criteria for CVA were met (74.3% of the time), peripheral tPA was administered to 27.7% of these patients, with

9.9% undergoing a neurointerventional procedure. There was a high rate of agreement with EMS triage-based stroke and the hospital discharge diagnosis of ischemic stroke or transient ischemic attack (TIA) (N = 91; 66.9%). Seven additional patients had the diagnosis of intracerebral hemorrhage, raising the rate of ischemic stroke and TIA, and including hemorrhagic stroke, to 72% (N = 98). The other 38 patients were discharged with a non-stroke diagnoses, including the diagnosis of seizure, migraine, or other medical / neurologic process. Over the five years of study, the total number of scene stroke patients transported per year increased from 2011 through 2013, followed by a decrease in 2014 and 2015. “Tele-Stroke” was introduced in 2014 for select referral hospitals. The proportion of patients that met all 3 EMS “Acute Stroke” triage criteria increased from 57% in 2011 to 89% in 2015, with mid-70% results in the intertwining years. In addition, the proportion of patients that received peripheral tPA per year peaked in the final two years at 24. **Conclusion:** Helicopter transport of suspected stroke patients is a safe and efficient method of transportation to a stroke center. There was a high rate of agreement with EMS triage-based stroke and the hospital discharge diagnosis of ischemic stroke or TIA.

### **Assessing the Accuracy of Computerized Tomography in Diagnosing Incarcerated Hernia**

Dana M. Coleman; Ronald J. Markert, PhD; Mbaga S. Walusimbi MD, FACS

*Presenting Author:* Dana Coleman

*Faculty Mentor:* Mbaga Walusimbi, MD, FACS

*Mentor’s Department:* Surgery

*Poster Number:* 61

**Research Question/ Objective:** To determine the dependability of computerized tomography (CT) scans in diagnosing incarcerated hernia in comparison to physical examination and operative findings. **Background:** Abdominal wall hernias and small intestine obstruction are common problems, occurring in about 15% and 4.6% of all open abdominal operations respectively. Historically, the reference standard for diagnosing abdominal wall hernia incarceration was solely the physical examination, whereas small intestinal obstruction was diagnosed by a combination of the history, physical examination, and x-rays. Today,

with the availability of CT, especially multi-detector CT, the diagnoses have become more reliant on this modality. Furthermore, intestinal ischemia can be identified with this technology, which in theory should lead to early diagnosis and early discharge especially when the physical examination is unreliable. How accurate is the CT scan in diagnosing incarceration or complete small intestine obstruction? **Methods:** For this retrospective study, patients who had surgery for small bowel obstruction or abdominal wall hernia repair at Miami Valley Hospital in 2013 were identified. A total of 367 patients were identified. Data was gathered, including history, physical examination, radiology reports, laboratory values, and operative reports as well as demographic data. The cases used for analysis were non-duplicate patients who had a hernia repair operation. **Results:** The sensitivity of CT in diagnosing incarceration is 42.9% and the specificity is 84.2% compared to a standard reference. In patients with obstruction by CT scan, 90% had a prior abdominal surgery. The mean hospital length of stay for patients with a CT scan that had surgery was 7.01 days  $\pm$ 10.97 compared to 3.83 $\pm$ 4.35 for those who did not have a scan. **Conclusion:** Based on these data, CT scans are less reliable than physical examination in diagnosing hernia incarceration. Our results confirm that the most common cause of small bowel obstruction is previous abdominal surgery.

### **Assessing the Reliability of Computerized Tomography in Diagnosing Incarcerated Hernia**

Uchenna Conley; Thomas Krzmarzick, MD; Adrienne Stolfi, MSPH

*Presenting Author:* Uchenna Connley

*Faculty Mentor:* Thomas Krzmarzick, MD

*Mentor’s Department:* Emergency Medicine

*Poster Number:* 17

**Research Question/ Objective:** Identify whether pediatric health disparities with regards to abdominal pain management occur in the emergency department. **Background:** The Institute of Medicine defines healthcare disparities as “observed differences in quality of healthcare by race/ethnicity that are not due to access to care, clinical needs, patient preferences, or appropriateness of the intervention.” Evidence

suggests that unequal care for racial and ethnic minority patients exists in emergency medicine. Over the past decade, studies addressing pediatrics have considerably increased, covering a variety of topics including EM care, primary care, chronic disease, health care utilization, and Limited English Proficiency. Recent research has examined the connection between race and ethnicity to the care of several pediatric conditions typically seen in the ED. Racial/ethnic disparities in children's health and healthcare are extensive, pervasive, and persistent, and occur across the spectrum of health and health care. **Methods:** Review of secondary data from the National Hospital Ambulatory Medical Care survey regarding visits by pediatric patients who presented to the emergency department with abdominal pain; literature regarding healthcare disparities occurring in the emergency department; and health professional bias, patient perceptions, mistrust and perceived racism. **Results:** The literature reviewed indicates that there are racial/ethnic disparities with regard to pain control. These studies clearly demonstrate that disparities exist within the pediatric emergency department. These areas remain inadequately studied and there are other areas that the literature has yet to address. Additionally, emergency departments are settings conducive to stress and fatigue among health care providers. The stressful emergency department setting may foster providers' use of mental shortcuts or heuristics, including racial/ethnic profiling and stereotyping. Studies in adult populations suggest that providers are more likely to be influenced by stereotypes and bias when making decisions in the setting of time pressure and limited available information. The subjective nature of abdominal pain, combined with lack of an established patient-provider relationship in EDs, may enhance the use of heuristic methods for evaluating and managing children. Perceived racism may have both physiological impacts as well as influence patient trust of their physician and compliance with suggested medical treatments. When reviewing the medical implications of perceived racism, it is suggested that one further review the impact of lifetime and prevalence of stress in minority populations. **Conclusions:** As suggested by the literature, academic EM physicians must contribute to the solution. First, physicians must determine the extent that disparities exist within the specialty. To the extent

that disparities exist, identify and study causal factors. Finally, test interventions and track progress toward eradicating disparities from emergency medicine.

**Rapidly Reversible Anton's Syndrome in Association with Posterior Reversible Encephalopathy Syndrome (PRES)**

David Cook; Kazia Parsons; Bradley Jacobs, MD; Capt. Jon Pollock, MD; Thomas Pitts, MD

*Presenting Author:* David Cook

*Faculty Mentor:* Bradley Jacobs, MD

*Mentor's Department:* Neurology

*Poster Number:* 49

**Research Question/ Objective:** To educate readers on Posterior Reversible Encephalopathy Syndrome (PRES) and Anton's Syndrome and the possible association between these two clinical entities. Early Recognition of PRES in the hospital setting followed by appropriate management can result in favorable outcomes for the patient.

**Background:** PRES is characterized by the symptoms of seizures, impaired consciousness, impaired vision, vomiting, nausea, and focal neurological signs. The diagnosis is typically made by head CT or MRI; displaying bilateral symmetric brain edema in the posterior cerebral cortex. The pathophysiology of PRES is not completely understood but has been explained by 2 hypothesis; disordered cerebral auto regulation leading to vasogenic edema and endothelial dysfunction caused by ingestion of exogenous toxins/substances. Anton's Syndrome is a rare presentation of posterior brain damage in which the patient is unaware of blindness, and denies the problem even when it is explained to them. It differs from cortical blindness in that the patient is unaware that the visual pathway is disrupted. **Case**

**Presentation:** The patient is a 44 year old Caucasian female with a history of a seizure disorder and IV heroin abuse who was transferred to this hospital for acute encephalopathy. The patient was agitated and unable to cooperate for reliable history upon arrival. The patient's husband indicated that she had been endorsing abdominal pain for several hours that day and was subsequently found to be less responsive. Her husband reports continuing IV heroine abuse in addition to inhaling isopropyl alcohol several times



daily. She was taken to an outside hospital where she was noted to have slurred speech, hypertension to 188/100, and later had a witnessed generalized, tonic-clonic seizure during head CT. Head CT was notable for possible acute hemorrhage in left parietal lobe and patient was transferred to this hospital for further evaluation. She was treated with benzodiazepines and levetiracetam. She had previously been prescribed levetiracetam for known seizure disorder but is reported to be non-adherent to treatment. At this time, the patient was admitted to the ICU and general neurology was consulted.

On exam, patient was lying in bed and unable to purposefully follow commands. She was able to move all 4 extremities and withdrew to pain. Visual fields were without reaction to threat bilaterally and patient consistently confabulated information when asked to open eyes and count fingers held in front of her. She was similarly unable to correctly state the correct number of medical personnel in the room and appeared to confabulate. This exam finding drew concern for cortical blindness vs. Anton's syndrome. MRI/MRA on day of admission was notable for extensive cortical and subcortical edema with areas of acute cortical infarction most pronounced posteriorly with small area of acute left parietal hemorrhage. These findings are most consistent PRES with superimposed complicating infarction and hemorrhage. Continuous EEG monitoring recorded no new seizure activity overnight and patient's neurological exam remained unchanged on day 2 of admission. The patient showed drastic improvement beginning in the afternoon on hospital day 3. Mental status, CNs, Motor, and sensory neurological exams were within normal limits beginning on hospital day 4. Her vision improved and the patient was able to follow commands. Her blood pressure had improved with oral medications and the patient was discharged on hospital day 7.

**Discussion:** This patient's case represents an unusual presentation of reversible Anton's Syndrome concurrent with Posterior Reversible Encephalopathy Syndrome (PRES). Although hypertension is commonly associated with PRES and this patient did experience BP control issues during her hospitalization, blood pressures recorded are unlikely to have remained above the limit of auto regulation for a sufficient amount of time to fully explain the patient's symptoms and

radiologic findings. Her chronic use of heroin and isopropyl alcohol support a possible cytotoxic etiology in this patient's case. The interesting part of this patient's presentation is the complete and rapid reversal of her Anton's Syndrome manifestations with resolution of PRES within a 24 hour period. Anton's Syndrome, also known as visual anosognosia, has been associated with a number of different etiologies but typically does not resolve as quickly as was demonstrated in this case.

**Clinical Relevance:** PRES is a syndrome characterized by seizures, impaired consciousness, impaired vision, vomiting, nausea, and focal neurologic signs that if recognized and treated appropriately and quickly, symptoms may resolve within days and lead to excellent outcomes for the patient. In this case, the clinical presentation of Anton's syndrome was rapidly and completely reversible with management of her PRES.

#### **Pain Scores for Standardized Painful Stimuli Among Emergency Department Patients**

Alexander Cook; Catherine A. Marco, MD; Julie Whitis; James Xidas; Bonnie Egan; Dennis Mann, MD, PhD; James E. Olson, PhD

*Presenting Author:* Alexander Cook

*Faculty Mentor:* Catherine Marco, MD

*Mentor's Department:* Emergency Medicine

*Poster Number:* 52

**Research Question/ Objective:** Treatment for pain and related conditions has been identified as the most common reason for Emergency Department (ED) visits. Effective pain management results in improved patient satisfaction, reduced anxiety, and improved comfort. This study was undertaken to measure self-reported pain scores for standardized painful stimuli among Emergency Department (ED) patients. **Background:** This was a prospective study conducted at Miami Valley Hospital, an urban ED with an annual census of 95,000. Data were collected from a verbally administered patient survey and from the ED medical record. **Results:** Among 219 ED patients, participants reported a wide range of pain associated with blood pressure cuff and venipuncture (Range 0-10). Pain scores related to blood pressure cuff had a median of 0 and a mode of 0. Pain scores related to venipuncture had a median of 2 and a mode of 0. Self-reported

blood pressure cuff pain score was 0.79 points higher for females than males ( $p=0.05$ ); 0.67 points higher for ambulance arrival compared to walk-in ( $p=0.09$ ); and 0.80 points higher for patients with a history of anxiety ( $p=0.05$ ). Self-reported venipuncture pain score was 1.38 points higher for African American patients than White patients ( $p<0.001$ ); 0.83 points higher for patients who arrived by ambulance compared to walk-in ( $p=0.02$ ); 1.18 points higher for patients who had 2 or more venipuncture attempts ( $p=0.03$ ); and increased by 0.11 points for every 1 point increase in triage pain score ( $p=0.02$ ). **Conclusion:** ED patients reported a wide range of pain associated with blood pressure cuff and venipuncture. Higher pain scores associated with blood pressure cuff were associated with female gender, ambulance arrival, and history of anxiety. Higher pain scores associated with venipuncture were associated with African American ethnicity, ambulance arrival, and 2 or more venipuncture attempts.

#### **Application of Medical Student Research Objectives in an International Medical Elective: Voluntary Medical Male Circumcision in Swaziland**

David J. Dennis, BS; Alison M. Bales, BA; Robert C. Siska, BS; David J. Dennis, BS; Echo VanderWal PA; Harry VanderWal, MD2; Ronald J. Markert PhD; Mary C. McCarthy, MD FACS

*Presenting Author:* Jameson Dennis  
*Faculty Mentor:* Mary McCarthy, MD  
*Mentor's Department:* Surgery  
*Poster Number:* 9

**Research Question/ Objective:** Does engagement in academic research during international medical electives enhance the educational experience for student? **Background:** Educational objectives for medical student international electives are an important part of any travel program. Objectives such as learning research methodology or engaging in research projects focus students during their travels and are a valuable way to reinforce curriculum goals. Our project focuses on the use of an international database by medical students to produce clinically significant findings impacting international health policy. Our study examines the adverse event rate in voluntary medical male circumcision, a procedure demonstrated to reduce

HIV transmission by over 60%. Not only is voluntary medical male circumcision a method of HIV prevention; it is also nearly 40 times more cost effective in comparison with the treatment of HIV using antiretroviral medications. By engaging in an academic research study during the international elective students increased the educational value of the trip. **Methods:** The Luke Commission is a NGO that provides mobile health outreach to rural Swaziland, including HIV testing and prevention. They perform more than 100 voluntary medical male circumcisions each week. The Luke Commission maintains a database demonstrating program productivity and effectiveness. Information collected from 1500 Swazi males during the first six months of 2014 was de-identified and analyzed after approval by the Wright State University School of Medicine IRB. **Results:** During this time period 34 adverse events occurred in 31/1500 patients, these included bleeding, infection, and wound dehiscence. The overall adverse event rate for the procedure was 2.3%. Boys <12 years old had adverse events in 22/1022 circumcisions (2.2%) and patients  $\geq 13$  incurred 11/478 (2.3%;  $p=0.66$ ). Patients  $\leq 29$  kg body weight had 19/662 (2.9%) and patients  $\geq 30$  kg had 13/838 (1.6%;  $p=0.40$ ). There were no adverse events reported in 75 HIV-positive patients included. There were more wound dehiscences during the summer months, 10/333 (3.0%) versus 10/630 (1.6%) in fall and 0/517 (0%;  $p=0.001$ ) in winter. **Conclusion:** Aid organization databases provide a source of information that can be used by medical students for research during international medical electives. The relationship between aid organizations, medical students, and patient populations can be a collectively beneficial one. Global health research has many complexities, but through careful planning and cultural awareness, medical students can contribute by publishing research that brings attention to global health issues and improves policies while having a significant positive effect on their own educational experience.

## Improving Healthcare Outcomes in the Peruvian Amazon

Hershel Dobkin; Marc Lubitz

*Presenting Author:* Hershel Dobkin; Marc Lubitz

*Faculty Mentor:* Mary T. White, PhD

*Mentor's Department:* Community Health

*Poster Number:* 45

**Research Question/ Objective:** This Observational Study illustrates the contributions and the limitations of the Project Amazonas organization to the Healthcare of the Peruvian Amazon and suggests how the organization can further benefit the health of the people in the region. **Background:** Project Amazonas is an NGO that operates mobile healthcare clinics along tributaries of the Peruvian Amazon River. The Peruvian Amazon is an extremely isolated geographical area where there is reduced access to food, water, and shelter leading to many negative healthcare outcomes. The purpose of this observational study is to illustrate the contributions and the limitations of the Project Amazonas organization to the healthcare of the villages it serves and suggests how the organization can further improve healthcare in the region. **Methods:** Questionnaires were orally distributed to 19 people on the Project Amazonas expedition in June, 2015. These included student volunteers, Peruvian healthcare professionals, and the boat crew which managed logistical arrangements. For Spanish speaking participants, volunteer and native Peruvian Gretta Marston conducted interviews in Spanish and translated the responses into English. Data were compiled and statistically analyzed to determine areas of strength and the limitations of the organization. **Results:** We received completed surveys from all participants. Only statistically significant results are included. On a 1-10 Scale, survey participants ranked cost effectiveness for resources used by Project Amazonas as a 7. Participants ranked average needs met by patients as a 6 and Project Amazonas having adequate funding as a 5.5. Volunteer preparedness was compiled to be 6. These 4 categories all represent areas needing improvement. Averages were calculated using the "mean" method which entails calculating the summation of individual responses followed by a division of total participants. The mean for all surveyed areas was used instead of the mode or

median methods due to our belief that the mean most accurately represents the true sentiments of those interviewed.

Survey results indicate that more resources should be used to educate patients on sanitary practices, proper diet, and common endemic diseases (parasites, Malaria, Yellow Fever, etc.) for better long term care. In addition, our data shows that PA needs more funding for medications and equipment. Results showed a need for a stronger Spanish language and medical knowledge background to more efficiently communicate with and care for local inhabitants. Surgical and obstetric related care are considerable areas for improvement and resource allocation based off our data and observation, however these goals are unrealistic with current funding. **Conclusion:** By focusing more on sanitation, diet and primary disease prevention, PA can improve outcomes more cost effectively. Student volunteers should receive instruction on Spanish language and medicine prior to embarking on the trip. Future research should have a larger sample size and address language barriers. Obstetric and surgical care are greatly needed but are unrealistic goals with current funding

## Downregulation of miRs 203, 887, 3619, and 182 Prevent Vimentin-Triggered, Phospholipase D (PLD)-Mediated Cancer Cell Invasion.

Kristen Fite, Julian Gomez-Cambronero, PhD

*Presenting Author:* Kristen Fite

*Faculty Mentor:* Julian Gomez-Cambronero, PhD

*Mentor's Department:* Biochemistry and Molecular Biology

*Previous submission:* Central Research Forum, Wright State University, Dayton, OH (October 2015),

Basic and Clinical Department Researchers, Harvard Anaesthesia Departments (November 2015)

*Poster Number:* 12

**Research Question/ Objective:** The objective was to investigate the regulation of Phospholipase D (PLD) expression and activity in relation to the epithelial-to-mesenchymal transition (EMT) and cell invasion of breast cancer cell lines. **Background:** Breast cancer is a leading cause of morbidity and mortality among women worldwide.

Metastasis is initiated after epithelial-mesenchymal-transition (EMT), enabling cells to invade surrounding tissue and enter the circulation. Phospholipase D (PLD) and its enzymatic product Phosphatidic Acid (PA) activate many cell signaling pathways, including cell proliferation, protein synthesis, and cell migration. PLD is upregulated in many metastatic-stage cancers, including breast cancer. Here, we investigated the regulation of PLD expression and activity and its role in EMT and breast cancer metastasis. **Methods:** Knowing the 3'-UTR sequences of both PLD isoforms, PLD1 and PLD2, we found 6 putative miRs that align to specific regions on each PLD protein using bioinformatics analysis (TargetScan Human). We synthesized DNA plasmids with the miR sequences being cloned into the pEZX-MR04 vector, as well as RNA "mimics". Additionally, we cloned the 3'-UTR sequence of PLD2 downstream of a luciferase ORF and co-transfected mammalian cells with this construct and the putative miRs and determined luciferase activity, which should be decreased if the miR-3'UTR match occurred in living cells. To demonstrate that specific miRs mediate PLD-driven cell invasion aggressive phenotype (characterized as high endogenous PLD enzymatic activity and high capability of cell invasion of tissues,) we designed experiments aimed at reversing the invasive phenotype of the basal cancer cells by ectopically transfecting them in to these basal cells. Controls for transfection were mRNA expression (by QPCR), activity of 3'-UTR (by luciferase activity) and protein expression (by Western blots and fluorescence microscopy). The read-outs for the "highly invasive" phenotype were high PLD enzymatic activity and high cancer cell invasion in Matrigel. **Results:** We have found a connection between EMT markers and the expression of 4 microRNAs (miRs), mediated by the signaling enzyme phospholipase D (PLD). Low aggressive MCF-7 breast cancer cells have low endogenous PLD enzymatic activity and cell invasion, concomitantly with high expression of miR-203, 887 and 3619 (that decrease PLD2 translation and a luciferase reporter) and miR-182 (targeting PLD1) that are therefore "tumor-suppressor like" miRs. The combination miR-887+miR-3619 abolished >90% PLD enzymatic activity. Conversely, post-EMT MDA-MB-231 cells, have low miR expression, high levels of

PLD1/2 and high aggressiveness. The latter was reversed by ectopically transfecting the miRs, which was negated by silencing miRs with specific siRNAs. We uncovered that molecular mechanism is that E-cadherin triggers expression of the miRs in pre-EMT cells, whereas Vimentin dampens expression of the miRs in post-EMT, invasive cells. **Conclusions:** This novel work identifies for the first time a set of miRs that are activated by a major pre-EMT marker and deactivated by a post-EMT marker, boosting the transition from low invasion to high invasion, as mediated by the key phospholipid metabolism enzyme PLD.

### **Distinct Morphological and Biochemical Changes Associated With Mitogenesis in Murine T Lymphocytes**

Jennifer Gibson; Pavani Beesetty; J. Ashot Kozak, PhD

*Presenting Author:* Jennifer Gibson

*Faculty Mentor:* J. Ashot Kozak, PhD

*Mentor's Department:* Neuroscience Cell Biology and Physiology

*Previous submission:* Central Research Forum, Wright State University, Dayton, OH (2015)

*Poster Number:* 55

**Research Question/ Objective:** In this study we used an automated, high throughput method to measure the cell diameter of live murine T-lymphocytes in resting and mitogen-activated states. The goal was to determine both the amount of growth taking place during blastogenesis, as well as to determine if the growth is essential to the activation process. **Background:** The process of blastogenesis (blast transformation) in T-lymphocytes has been well documented in the literature and shown to consist of a measureable sequence of events. Even though the size increase known to take place between the initial activation stimulus and T-cell proliferation has been described previously in several mouse strains (e.g. DeCoursey et al., 1989), there has not been an objective, empirical study done to quantify the extent of this growth and its role in activation. **Methods:** All cells were isolated from adult female ICR-9 mice. A total of 12 mice from 3 different litters were used. Activation of purified splenic T cells was performed within 24 hours of isolation. Cells were activated pharmacologically using a combination of

phorbol 12-myristate 13-acetate (PMA) (Thermo Acros Organics) and ionomycin calcium salt (Sigma-Aldrich). The average diameters of resting and activated T lymphocytes were measured 48 hours after activation and within 72 hours of isolation. Both resting and activated cells were run at the same time to account for any pre-activation in the resting cells. Cell diameters were measured with a Vi-Cell cell viability analyzer (Beckman Coulter). **Results:** A reproducible, predictable growth in cell diameter is associated with normal activation of T-cells. This size increase is significant, with cells expanding in diameter by 35-40% on average within 48 hours of activation. The size change appears to peak at the 48 hour mark, and is sustained throughout the proliferative phase of T-lymphocyte activation. Successful activation also appears to require this substantial increase in size, with other indicators of activation (such as clustering and proliferation) failing to appear in conditions where only a modest diameter increase is observed. This growth in diameter is reduced by immunosuppressants such as cyclosporin-A (CsA), but not completely abolished. CsA is a calcineurin inhibitor which prevents dephosphorylation of NFAT transcription factors. Since CsA does not completely prevent the size increase, the growth may be due in part to calcineurin-independent mechanisms. **Conclusion:** The size increase in T-lymphocytes is a distinct and early step in the blastogenesis pathway, with its own characteristics and secondary chemical indicators.

#### **Team-Based Learning Format for Medical Student Health Literacy Skills Development**

Katherine Helmuth; Gregory Toussaint, MD; Adrienne Stolfi, MSPH; Bruce Binder, MD, PhD; Shalini Forbis, MD, MPH.

*Presenting Author:* Katherine Helmuth

*Faculty Mentor:* Shalini Forbis, MD

*Mentor's Department:* Pediatrics

*Poster Number:* 30

**Research Question/ Objective:** To evaluate a novel medical student education intervention in health literacy and communication techniques. We propose team-based learning (TBL) and simulated patient encounters (SPE) are more effective than a didactic-based curriculum. **Background:** In 2008 over a third of U.S. adults had basic or below basic

health literacy skills. A Healthy People 2020 objective is to improve health literacy through more satisfactory communication between healthcare providers and patients. **Methods:** 188 3rd-year medical students from Wright State University were included. 97 students from the class of 2014 were the control group (CG) and 91 students from the class of 2015 were the intervention group (IG). During their core pediatric clerkship, the CG underwent a typical didactic on health literacy and communication consisting of a 40-min lecture and 20 min of role-playing. The IG participated in a TBL-based session, providing the same information, and a health literacy SPE with formal feedback on their communication skills. Both groups then underwent a 12-station objective structured clinical examination (OSCE) at the beginning of 4th year. The OSCE included a health literacy (HL) patient station in which the simulated patient evaluated students' communication skills with a 17-item checklist. Overall checklist scores were compared with a two-sample t test and individual items on the checklist were compared with chi-square or Fisher's exact tests. **Results:** Mean $\pm$ SD scores on the HL OSCE were CG 10.5 $\pm$ 2.6 vs IG 12.3  $\pm$ 2.0, ( $p<0.001$ ) on the 0-17 point scale, indicating that on average the IG performed 1.8 of the tested communication skills more than the CG. 68% of IG, compared to 34% of CG, used plain language ( $p<0.001$ ) and 89% of IG, compared to 61% of CG, refrained from using abbreviations or medical terms ( $p<0.001$ ). Additionally, 42% of IG utilized "teach-back" vs 23% of CG. When reviewing medication instructions 97% of IG reviewed how often to give the med vs 85% CG ( $p=0.005$ ). For asthma action plan review, 79% of IG reviewed all zones vs 60% CG ( $p=0.004$ ). The groups did not differ in overall scores for the 11 non-health literacy OSCE stations. **Conclusion:** The addition of active learning to the third year didactic on health literacy and communication improved medical students' ability to communicate effectively with patients with low health literacy. IG medical students were more likely to utilize the discussed techniques during OSCE evaluation.

## **Barber Say Syndrome: A Case Report**

Jennifer Hilgeman; M. David Yohannan, MD;  
Kaitlin Allsbrook

*Presenting Author:* Jennifer Hilgeman

*Faculty Mentor:* Mulakkan David Yohannan, MD

*Mentor's Department:* Neonatology

*Poster Number:* 43

### **Research Question/ Objective:**

Barber-Say Syndrome is a rare congenital disorder characterized by hypertrichosis, redundant skin, macrostomia, bulbous nose, and ocular telecanthus. Next generation genome sequencing has shown a relationship between the TWIST2 gene mutation and Baber-Say Syndrome and a similar syndrome, Ablepharon Macrostomia Syndrome. In this case we will explore the clinical features characterized by this disorder and genetic mutations found in our patient. **Background:** Barber-Say Syndrome (BSS) is a rare congenital disorder characterized by hypertrichosis, redundant skin, hypoplastic or absent nipples, and dysmorphic facial features including macrostomia, bulbous nose, ocular telecanthus, eyelid ectropion, and abnormal ears [1]. Patients with cleft palate and genital abnormalities have also described [2]. In 1982, Barber et al. was the first to report multiple congenital abnormalities such as macrostomia, ectropion, hypertrichosis and growth retardation in a 3-year-old girl [3]. According to literature only 14 cases of BSS have been reported since that time [1-12]. Recently it has been postulated that BSS and Ablepharon Macrostomia Syndrome (AMS) could represent one disorder due to their similar patterns of organ involvement including skin, hair, eyes, face, and external genitalia [6]. Distinguishing features include hypertrichosis in BSS only and ablepharon or microblepharon, and sparse hair in AMS. **Case Presentation:** The patient was a term infant born via spontaneous vaginal delivery to a 22-year-old G1P0 mother. Pregnancy was complicated by THC use and positive GBS status of the mother. The patient's mother had five fetal ultrasounds due to difficulty with gender identification, but no other abnormalities were detected. Apgar scores were 8 and 9 at 1 and 5 minutes after birth. His birth weight was 3650 grams (73rd percentile), length 51.5 cm (80th percentile), and OFC 34.2 cm (42nd percentile). Family history was unremarkable and

consanguinity was denied. Following delivery, multiple facial dysmorphic features were noted and the baby was transferred to our neonatal intensive care unit for further management and diagnosis. Admission physical exam reveal a markedly dysmorphic male with hypertelorism, bulbous nose, macrostomia, hypoplastic eyelids, ectropion, sparse eyelashes, absent eyebrows, low set posteriorly rotated ears, redundant skin on the neck, and micrognathia. Also observed were hypoplastic nipples, diastasis recti, and hypertrichosis on the back. Patient also had a shawl scrotum concealing an anatomically normal shaft and glans of the penis.

**Discussion:** Laboratory tests, ECHO, Brain MRI, VCUG, and hearing screen were normal. Ultrasound of the abdomen showed mild right hydronephrosis. ENT evaluation showed a soft palate cleft. Due to feeding difficulties and intermittent stridor ENT recommended a frenulectomy and a sleep study that showed abnormal sleep architecture, obstructive sleep apnea, and micrognathia. Ophthalmology evaluation showed a normal macula, fovea and periphery and recommended vigorous eye lubrications for hypoplastic eyelids. Patient was discharged home on day of life eleven. At one month of age, he was able to close his eyes fully, feeding and gaining weight appropriately and had small fibromas noted on alveolar ridge and toes. There are currently no plans for ophthalmologic surgery.

Genetic testing was sent to Fulgent Genetics. Due to the unavailability of targeted testing for Barber-Say Syndrome whole exam sequencing was performed to establish a possible genetic mutation. TWIST2 sequencing was ordered based on previous reports of individuals with Barber-Say syndrome having pathogenic heterozygous mutations in the TWIST 2 gene. A Next Generation Sequencing approach was used and variants were detected in regions that had at least 10x coverage. A heterozygous variant in the TWIST2 gene (c.223G>C; p.Glu75Gln) was identified in the patient.

**Clinical Relevance:** Barber-Say Syndrome, a rare congenital disorder characterized by hypertrichosis, redundant skin, macrostomia, bulbous nose, and ocular telecanthus, all of which were found in our patient. To our knowledge this is only the fifteenth reported case with this combination of defects. Interestingly our patient also had a soft palate cleft which has been

documented in only one other case of Barber Say Syndrome. Next generation genome sequencing showed a TWIST2 gene mutation which has previously been reported in cases of Ablepharon Macrostomia and Baber-Say Syndromes. Functional studies have shown that this mutation is in the basic helix-loop-helix DNA-binding domain of this protein. Additionally, this mutation alters the DNA-binding pattern of the TWIST2 gene. Parental testing is in progress to determine if this mutation is de novo or inherited, both of which been described in case of Barber Say Syndrome. Due to the rarity of this syndrome there are no guidelines for follow-up or surveillance for patients with this syndrome. It is importance for geneticist and general practitioners alike to follow these patients closely, monitoring for mental and growth retardation which have been previously reported in cases of Barber Say Syndrome, but the prevalence is unknown.

**Influence of Genetic Variations in Fcγ Receptors (FcγR) and Cytochrome P450 (CYP450) Enzymes on Treatment Outcomes in ANCA-Associated Vasculitis (AAV)**

Divya Indrakanti; Rodrigo Cartin-Ceba; Gary S. Hoffman; Cees G. M. Kallenberg; Carol A. Langford; Peter A. Merkel; Paul Monach; Philip Seo; Robert Spiera; William St. Clair; Nadia K. Tchao; Steven R. Ytterberg; Ulrich Specks; John Stone; Dan Birmingham; Brad H. Rovin

*Presenting Author:* Divya Indrakanti

*Faculty Mentor:* Dr. Brad Rovin

*Mentor's Department:* Internal Medicine

*Previous submission:* Vasculitis Workshop 2015, London, UK; American Society of Nephrology, Kidney Week 2015, San Diego, USA

*Poster Number:* 16

**Research Question/ Objective:** The goal of this study is to determine if genetic-based differences in proteins that contribute to rituximab (RTX) or cyclophosphamide (CYC) effectiveness influenced the outcomes of the Rituximab in ANCA-associated Vasculitis (RAVE) clinical trial. **Background:** The RAVE clinical trial compared RTX to CYC for the treatment of AAV. Using the RAVE cohort we investigated whether known single nucleotide polymorphisms (SNPs) in FcγR or CYP450 enzyme genes were associated with the

response to RTX and CYC treatment, respectively. **Methods:** SNPs for FcγR (FcγRIIA 491G>A, FcγRIIB 695T>C, FcγRIIA 559T>G) and CYP450 (CYP2B6 1459 C>T, CYP2C19 681 G>A) were analyzed by direct sequencing of PCR-amplified genomic DNA. Each SNP was tested as a predictor of the primary outcome, complete remission at 6 months, using logistic regression including the covariates baseline BVAS/WG, ANCA type, and new versus relapsing disease. The association of these SNPs with the trial's secondary outcomes, including time to complete remission, time to relapse, and time to B-cell reconstitution, were analyzed by Kaplan-Meier and Cox proportional hazard ratios. **Results:** No significant associations were identified between complete remission and any FcγR genotype in the rituximab group, or any CYP450 genotype in the cyclophosphamide group. However, when the treatment groups were combined, an association was found between the 491AA genotype of FcγRIIA and complete remission (P = 0.01). The 491AA genotype predicted complete remission (P = 0.009) and a shorter time to complete remission (P < 0.001). **Conclusion:** None of the SNPs tested influenced response to treatment with RTX or CYC in AAV. The finding that FcγRIIA 491 G>A was associated with a shorter time to complete with both RTX and CYC implies FcγRIIA may be involved in disease pathogenesis and response to therapy.

**Is Nasotracheal Intubation Safe in Facial Trauma Patients?**

Omeed Jazayeri-moghaddas; Tse W; Gans AJ; Herzing KA; Markert RJ; Mary McCarthy, MD

*Presenting Author:* Omeed Jazayeri-moghaddas

*Faculty Mentor:* Mary McCarthy, MD, FACS

*Mentor's Department:* Surgery

*Poster Number:* 35

**Research Question/Objective:**

Potential injury due to nasotracheal intubation in facial trauma patients led to a preference for oral intubation in the prehospital setting. This study compared the complications of nasal and orotracheal intubations performed by an air ambulance crew. **Background:** Many procedures and devices have been developed to allow medical personnel to access the airway and maintain adequate ventilation. The most commonly used

method of intubation is orotracheal. However, when the patient prevents oral access, either due to oropharyngeal obstruction or clenched teeth, nasotracheal intubation (NTI) is invaluable. During NTI, the tube is inserted into the nares, rotated and directed into the trachea. A lighted stylet or whistle on the end of the tube may be of value in providing guidance into the airway. Common complications are epistaxis, sinusitis, and nasal trauma. Many physicians believe that mid-face instability is an absolute contraindication for a NTI, due to the increased risk for complications. One study demonstrated that blind NTI may be safe for patients with facial trauma. However, this is an area of considerable controversy. There are concerns about violation of the cribriform plate with introduction of the tube into the brain, sinusitis, or spread of infection to the brain. This research project will assess the success and complications of nasotracheal intubation performed by trained nurse-paramedics on CareFlight, and to compare our results to those of the other study in the literature. We hope to provide evidence to support the nasotracheal tube as a beneficial, lower risk alternative in patients with compromised airways and facial trauma. **Methods:** For this study, 212 patients with facial trauma were abstracted from the trauma registry; 77 were nasally and 135 orally intubated. The matching process resulted in an oral group that was older ( $41.1 \pm 17.6$  vs.  $35.1 \pm 14.7$  years,  $p=0.02$ ), and had a higher facial abbreviated injury mean score ( $1.8 \pm 0.6$  vs.  $1.4 \pm 0.5$ ,  $p<0.001$ ). Nasotracheal tubes were removed or converted to endotracheal tubes in 61 of the 77 (79.2%) patients within three days. Data were analyzed with the Mann-Whitney Test, Fisher's Exact Test, and chi square test. **Results:** The two groups did not differ in mortality (nasal 23.4% vs. oral 17.8%,  $p=0.33$ ), intensive care unit length of stay (nasal  $7.5 \pm 9.1$  vs. oral  $7.4 \pm 8.0$  days,  $p=0.73$ ), or total length of stay (nasal  $13.3 \pm 14.3$  vs. oral  $13.4 \pm 14.1$  days,  $p=0.67$ ). Nor did the groups differ on the complications of sinusitis, pneumonia, arrhythmia, deep vein thrombosis, urinary tract infection, cardiac arrest, atelectasis, or respiratory failure. However, nasally intubated patients were more likely to have any complication (44.2% vs. 28.1%,  $p=0.018$ ) and more likely to be extubated within 24 hours (26.0% vs. 8.9%,  $p=0.003$ ). **Conclusion:** Prehospital nasal intubation

may be a viable alternative to oral intubation in patients with facial trauma.

### **The Effects of Uranium Exposure on Native American Adolescent Pregnancy Rates**

Christen Johnson; Naila Khalil, MBBS, MPH, PhD

*Presenting Author:* Christen Johnson

*Faculty Mentor:* Naila Khalil, MBBS, MPH, PhD

*Mentor's Department:* Community Health

*Previous submission:* March 25, 2016; Dr. Wilbert C. Jordan MD Research Forum- Austin, Texas

*Poster Number:* 15

**Research Question/ Objective:** This study aims to assess the association of Uranium exposure to adolescent pregnancy rates in New Mexico (NM).

**Background:** Uranium (Ur) is a xeno-estrogens which mimics estrogen in the body. Estrogen triggers puberty through its activity on reproductive hormonal pathways in both males and females. Earlier exposure to uranium has been associated with earlier reproductive development. If physical maturation precedes cognitive maturation earlier in life, the risk of adolescent pregnancy is increased. Currently, the adolescent birth rates of the Native American population surpass the national average.

**Methods:** Data for this study was obtained from a. NM Bureau of Vital Records and Statistics (2009-2013 birth data); b. United States Census Bureau (2013 population); c. Navajo Area Radiation and Exposure Screening program and the NM Bureau of Geology and Mineral Resources (2013 mining); d. NM Environmental Public Health Tracking System (2013 water). Adolescents were described as less than 20 years old and defined as young adolescents (17 years old or younger) or older adolescents (18-19 years of age). Birth rates for each county were calculated though the birth data analyzed and population data as provided by the. A descriptive analysis of de-identified birth data was performed. Spearman product-moment correlation coefficient was used to assess the relationships between adolescent birth rates, Ur water levels, and the number of Ur mines in each county in aggregate, by age group, and by race. Relative Risk of elevated birth rates ( $>80$  births per 1000) with elevated Ur exposure (47 Mines or  $> 6.6 \mu\text{g/L}$ ) was computed. The frequency distributions were examined for categorical variables. A geographic representation of the correlation between the birth



rates per county and Ur exposures was created using Epi Info GIS analytical software. **Results:** In NM, 18,158 adolescent females that gave birth, 15% were Native American. Thirty-three percent were young adolescents. Statistically significant positive correlations were found between the numbers of births and the numbers of mines per county for the Native American population overall (rs:0.49,  $p<0.001$ ) and by age stratification (10-17 age: rs:0.48,  $p=0.005$ ; 18-19 age: rs:0.49,  $p=0.004$ ) as well as between the birth rate and the numbers of mines per county for the Native American population overall (rs:0.28,  $p=0.025$ ) and in the 10-17 year age group (rs:0.38,  $p=0.030$ ). The relative risk of elevated birth rates with increased uranium exposures was statistically significant for the younger adolescents of all races and the Native American young adolescents as well as the Native American older adolescent population. **Conclusion:** A statistically significant correlation between Native American adolescent birth rates and Ur exposures was noted. Ur exposure may not be attributed to water sources, as there was no statistically significant correlation found between Ur water levels and birth rates. Future research on Ur exposure and reproductive outcomes in this population is warranted.

### **Improving Healthcare Provider Competency and Patient Advocacy for LGBT Health through a Sexual History Workshop**

Justin Kelley, MD/MPH Student, Kazia Parsons, MD Student, Kaci Webb, MD Student, Marie Walters, MD/PhD Student, and Nikki Rogers, PhD, CPH

*Presenting Author:* Justin Kelley

*Faculty Mentor:* Nikki Rogers, PhD, CPH

*Mentor's Department:* Community Health

*Poster Number:* 33

**Research Question/ Objective:** A Sexual History Workshop for medical students was developed to address unique health needs of the LGBTQA+ community. The goal was to fill an educational gap by addressing LGBTQA+ health disparities through increased (1) HCP competency and (2) patient advocacy. **Background:** LGBTQA+ (lesbian, gay, bisexual, transgender, queer, asexual [LGBTQA] and other [+]) individuals face profound health disparities. Social and cultural

inequalities like stigmatization and discrimination are associated with poorer health status among the LGBTQA+ community when compared with their heterosexual peers. LGBTQA+ individuals require healthcare providers (HCPs) who are sensitive to their unique health needs. However, few medical schools address LGBTQA+ health. Disparities can be eliminated or significantly reduced if HCPs ask patients appropriate and nonjudgmental questions about sexual orientation and gender identity during the sexual history. **Methods:** A two hour experiential workshop was designed by students of the Boonshoft Pride organization at Wright State University Boonshoft School of Medicine to develop sexual history-taking skills among medical students. Medical students were invited via email and openly LGBTQA+ patient volunteers were recruited from the campus Office of LGBTQA+ Affairs. Medical students were given the opportunity to interview LGBTQA+ patients without additional training to test their knowledge and skills based on standard medical training. Retrospective pre/post testing was conducted using five questions on a 5-point Likert scale (Strongly Disagree, Disagree, Neutral, Agree, Strongly Agree). Medical students were asked questions about their comfort taking a sexual history and seeing LGBTQA+ patients. Patients were asked questions about their comfort answering a sexual history and seeing HCPs. Paired sample differences for the pre/post surveys were calculated for students and patients. **Results:** A total of 30 students and 4 patients attended the workshop; 5 students and 2 patients returned the surveys. Likert scale points increased after the workshop for both students and patients. Among students ( $n = 5$ ), overall average rating increased  $1.04 \pm 0.61$  points, comfort discussing sensitive topics with patients increased  $1.00 \pm 0.70$  points, comfort taking a sexual history increased  $1.80 \pm 0.45$  points, comfort taking a sexual history for LGBTQA+ patients increased  $1.00 \pm 0.70$  points and familiarity knowing special concerns for LGBTQA+ patients increased  $1.00 \pm 0.70$  points. Among patients ( $n = 2$ ), overall average rating increased  $1.70 \pm 0.95$  points, comfort talking about a sexual history increased  $2.00 \pm 1.41$  points, comfort being open with a provider increased  $1.00 \pm 0.00$  points, ease establishing trust increased  $1.50 \pm 2.12$  points, comfort discussing sensitive topics increased  $2.00 \pm 1.41$  points and comfort advocating for oneself increased  $2.00 \pm 1.41$  points.

A notable deviation included a patient who reported a decrease of two points for comfort being open with a new HCP after the workshop. **Conclusions:** The experience of taking and giving a sexual history in this workshop improved the sexual history experience for both medical students and LGBTQA+ patients. Students learned about LGBTQA+ health and patients reported improved self-advocacy for their own health. Low survey return posed significant limitations to evaluation. Future workshops should include preworkshop training and be mindful of the patient perspective to prevent possible harm. Recommendations include survey administration during the workshop and patient debriefing after the workshop.

### **Inaccuracies of Administrative Databases in Trauma Surgical Research: A literature review**

Katherine Kerrigan; Francis Speranza; Karen Herzing

*Presenting Author:* Katherine Kerrigan; Francis Speranza

*Faculty Mentor:* Priti Parikh, PhD

*Mentor's Department:* Surgery

*Poster Number:* 2 **\*\*Digital Presentation\*\***

#### **Research Question/ Objective:**

To compile a literature review on the major limitations associated with administrative database research. **Background:** Administrative databases of hospital admissions are increasingly being utilized for medical research. The availability of large numbers of patients along with the low cost and relative speed of data collection from these sources make them an appealing alternative to tedious patient chart review. However, it is becoming apparent that there are significant inaccuracies in the entry of clinical information into these databases. Furthermore, these errors may often go unverified, leading to unknown falsities in published studies. We recently used such an administrative database to compare treatments, outcomes, and costs of traumatic brain injury patients that went to the ICU with those that stayed on the trauma floor. It was assumed that the patient list from the trauma registry department reflected the proper patient population, Glasgow Coma score 13-15, traumatic brain injury, and specific interventions. After collecting data on 400 patients, the patient population was re-checked and found to

be inaccurate, with many patients not even meeting the study criteria. This literature review attempts to see how widespread and prevalent this problem is in medical research. **Methods:** A literature search was performed in EBSCOhost Databases and in PubMed for articles published between January 2009 and March 2016 with keywords: "inaccuracies in administrative databases" and "pitfalls in data collection". **Results:** A total of eight papers met the criteria. Review of this literature provided evidence that flawed data from administrative databases is a common issue among many institutions that not only produced inaccurate results but wasted months of time and energy of the research team. In comparing the data from a medical review of sickle cell anemia patients with acute chest syndrome (ACS) identified by one adult and two pediatric hospital databases in California with the California OSPHD (Office of Statewide Health Planning and Development) administrative databases, the administrative database underreported the number of treatments for ACS by 22%. Comparison of data for patients with intracranial aneurysm from a study at Johns Hopkins Hospital using the neurosurgery departmental database and the State of Maryland administrative database showed that the administrative database missed 16% of all cases and had significant inaccuracies in 10 of 12 categories regarding diagnoses and procedures. When comparing the prevalence of major congenital malformations associated with assisted reproductive technology (ART) reported by a study using data from the State of California administrative database with US population-based birth defects surveillance programs as well as data based on hospital discharges, it was found that the administrative database over-reported the data as being two times higher than the true prevalence (6.3-6.6% vs 2.5-3.5%). **Conclusion:** Despite the advantages in using administrative databases for medical research, it must be cautioned that these sources are burdened with limitations that need to be recognized. Researchers must carefully consider the available data and have a full understanding of possible limitations. Appropriate analytical methods and validation criteria specific to both the study and the database used are critical steps researchers must take to ensure a successful study. A data verification flowchart is proposed to confirm proper patient population criteria and provide

accountability in data collection to avoid wasted time and faulty results: Determine patient population specific to research questions -> set up query with data variables reflecting patient population -> double check these data variables (do they capture your patient pool?) -> run the report from the administrative database -> verify proper patient pool through confirming in patient charts -> periodically – every 100 patients – double check information.

**CareText, an Automated SBIRT Follow-Up Application with Motivational Interviewing Messages about Sobriety**

Matthew Knapke; L. Ilyas, MD; T. Bozung, MD, MPH; J. Embree; J. Vossler; M. Jacobson, DO, MPH, P. Hershberger, PhD; J. Wilson, DDS, PhD

*Presenting Author:* Matthew Knapke

*Faculty Mentor:* Therese Zink, MD

*Mentor's Department:* Family Medicine

*Poster Number:* 39

**Research Question/ Objective:** 1. To evaluate current Screening, Brief Intervention, Referral to Treatment (SBIRT) methods 2. To determine if utilizing SBIRT with an intervention of CareText enhances adherence to treatment goals.

**Background:** An automated, technology-based follow-up to SBIRT services, called CareText, which routinely reminds patients via text messages about their readiness and confidence to change regarding AOD use/abuse, was developed for primary care patients. The automated text-message system permits patients to receive and respond to text messages based on their individualized MI goals. Patients received three CareText messages each week for 12 weeks, two text messages containing a question followed by a text containing a motivational message. The messages are written in the “MI Spirit,” which attempts to strengthen the MI intervention used by medical staff. **Methods:** Patients (mean age=45.4) attending a FQHC-based Family Medicine clinic, who scored above the cut-off on the AUDIT-C or DAST-10 for AOD misuse/abuse, were randomly assigned to receive CareText (n=14) or a control group that did not receive CareText (n=15). CareText responding was monitored for 12 weeks; the AUDIT and DAST were administered at intake and 3-months post-intake to both groups. **Results:** Of the 14

participants in the CareText group, only one continued to respond to the CareText messages for the entire 12 weeks. By week 6, 50% had dropped out. However, CareText patients showed significant reductions in AUDIT scores over non-CareText patients from baseline to 3-month follow-up,  $F(1,25)=6.28$ ,  $p=.019$ . CareText patients also showed larger reductions in DAST scores than controls, although the interaction was not statistically significant. **Conclusion:** CareText patients, who had higher AUDIT and DAST scores at intake than controls, reduced AOD use below the control group. This pilot study demonstrated that patient attrition is a problem for CareText implementation in a population of primary care patients. CareText may be more successfully implemented with a population already engaged in AOD treatment and recovery, rather than a population seeking treatment for health problems unrelated (at least from the patient's perspective) to AOD misuse.

**Stress Electrocardiography (ECG) versus Radionuclide Myocardial Perfusion Imaging (rMPI) among patients admitted for chest pain: How often are we choosing wisely?**

Jaren Liston; Abdulfatah Issak, MD ; Karishma Samtani, MD; Dean Bricker, MD ; Ronald Markert, PhD

*Presenting Author:* Jared Liston

*Faculty Mentor:* Dean Bricker, MD

*Mentor's Department:* Internal Medicine

*Poster Number:* 28

**Research Question/ Objective:** To determine how often patients hospitalized for chest pain are studied with stress ECG versus rMPI, and to evaluate to what degree current practice follows the recommended appropriate use of these cardiac tests as described by American Heart Association (AHA) practice guidelines and published recommendations by the ABIM Foundation's Choosing Wisely campaign. **Background:** Chest pain is one of the most common reasons patients present to the Emergency Department and results in over 600,000 hospitalizations annually. The necessity of inpatient stress testing and particularly nuclear medicine perfusion imaging is not thoroughly studied, but may be over-utilized. The American Board of Internal Medicine (ABIM)

Foundation's Choosing Wisely initiative has identified the routine use of stress cardiac imaging among low risk patients as an expensive test that should be questioned by both physicians and patients. **Methods:** We examined medical records of selected patients from both the teaching and non-teaching medicine services of a 900 bed university affiliated teaching hospital in Dayton, who were admitted between January 1, 2014 and December 31, 2014 with primary diagnosis of chest pain using ICD 9 codes of 786.50 and 786.59. We included patients who met AHA appropriate use criteria for stress ECG and assessed whether they were tested with stress ECG (appropriate) or rMPI (potentially inappropriate). **Results:** A total of 130 patients from the teaching service and 103 patients from the non-teaching service were included in the study. Sex, age, EKG findings, and troponin changes at admission were similar between the two groups. The frequency of obtaining stress ECG when appropriate was 34.2% for teaching service versus 17.9% for non-teaching service ( $p = 0.015$ ). Stress ECG was carried out in only one quarter of the aggregate sample of patients for whom that study would have been appropriate. **Conclusions:** Our study shows substantial inconsistencies with adherence to appropriate use of cardiac tests per AHA guidelines and ABIM Foundation's Choosing Wisely campaign recommendations among low risk patients admitted for chest pain. Many unnecessary rMPI studies were performed when stress ECG would have been more appropriate. Choosing stress ECG when appropriate can translate into substantial future cost savings, as the typical cost of a stress ECG is \$200-\$300 compared with rMPI \$500-\$2,000, and can reduce unnecessary exposure of patients to potentially harmful radiation.

#### **Nursing Views of Influences on Parents' Recall of Their Child's Discharge Instructions**

Trisha Miller; Richard Rapp, PhD; Lucinda Brown, RN, Hannah Redding

*Presenting Author:* Trisha Miller

*Faculty Mentor:* Richard Rapp, PhD

*Mentor's Department:* Community Health

*Poster Number:* 32

**Research Question/Objective:** What barriers do nurses perceive in parents' understanding of their

child's discharge instructions from an acute care pediatric hospital? **Background:** The ability to understand and accurately follow discharge instructions has a great impact on healthcare outcomes. Multiple studies have found that understanding of discharge instructions is sub-optimal in both adults and pediatric caregivers. This study addresses factors contributing to parents' misunderstanding of their child's discharge instructions from an acute care hospital. **Methods:** Nurses at Dayton Children's Hospital were asked to complete an online survey created in Qualtrics Research Suite software. The survey presented nurses with 36 situations that might negatively influence parental recall of discharge instructions. Nurses were asked to indicate how often each characteristic played a role in a discharge encounter. The survey was left open for 3 weeks at which time the results were analyzed using factor analysis. **Results:** One hundred and five (105) surveys were completed by nursing staff. Factor analysis resulted in nurses identifying barriers in 6 different areas including: parental emotionality/distractibility, child services, parental learning barriers, lack of priority, paperwork explanation, and parental learning style. **Conclusions:** Nurses identified barriers in 6 different areas of the discharge encounter, which they perceived as affecting parent's understanding of their child's discharge instructions. Although the factors were based in both hospital and parental characteristics, it is the responsibility of the hospital to fix their own barriers and understand how to successfully resolve parental barriers. Further research should be done to develop methods to overcome these barriers in effective communication.

#### **Clinical exposures during internal medicine residency training**

Kathryn Morrison; Dean Bricker, MD; Ronald Markert, PhD

*Presenting Author:* Kathryn Morrison

*Faculty Mentor:* Dean Bricker, MD

*Mentor's Department:* Internal Medicine

*Poster Number:* 14

**Research Question/ Objective:** The objective of this study is to better understand the actual cases and patients seen by internal medicine residents

during their training to better understand the unique characteristics of the Wright State University Internal Medicine Residency Program.

**Background:** Residency programs strive to train residents through clinical exposures to diverse patient populations and a variety of patient problems. This descriptive study attempts to understand the diversity of patients and clinical problems to which Wright State University Internal Medicine residents are exposed at Miami Valley Hospital. **Methods:** We retrospectively reviewed records of all patients admitted to the internal medicine teaching service at Miami Valley Hospital from July 1, 2012-June 30, 2013. We analyzed the admitting and discharge diagnoses for nearly 3500 patients admitted to the main teaching hospital for the Wright State University Internal Medicine Residency. Diagnoses were grouped based on the International Classification of Diseases, Ninth Revision (ICD-9) into organ system-based classifications. We assessed demographic data and hospital length of stay. We assessed for correlations between resident In-Training Exam (ITE) scores by specialty content category and frequency of various diagnoses encountered. **Results:** A total of 3460 resident-managed patient encounters were reviewed. The average patient age was 52.1 years. The average length-of-stay was 3.42 days; 52.5% of admissions were female. Caucasian patients accounted for 64.9% of cases, Black/African-American patients 31.5%, and Hispanic/Latino patients 1.6%. Other races accounted for 2.1%, collectively. Symptoms, signs, and ill-defined conditions accounted for the largest majority of diagnoses (43.7% primary admission diagnosis and 19.6% primary discharge diagnosis). The three most common primary admission diagnoses overall, were chest pain, unspecified (786.50), shortness of breath (786.05), and abdominal pain, unspecified site (789.00). The three most common primary discharge diagnoses overall, were other chest pain (786.59), obstructive chronic bronchitis with acute exacerbation (491.21), and chest pain, unspecified (786.50). Residency-wide ITE scores (percentile) by specialty content category did not correlate with the frequency of various discharge diagnoses ( $r = 0.006$ ). However, PGY3 ITE percentile correlated weakly with frequency of diagnostic category ( $r = 0.298$ ). **Conclusion:** Our overall intent of this study was to reveal a snapshot into one year as a resident at the main teaching

hospital for the Wright State University Internal Medicine Residency Program, and in that effort, we were successful. It is also important to understand a program's individual strengths and weaknesses, so that we may know how best to adapt other learning opportunities to give residents the best possible breadth of clinical knowledge. Future additional clinical exposure in the areas of Rheumatology, Neurology, Women's Health, Psychiatry, and Dermatology may be beneficial for trainees. Future study would be needed at the Dayton VA Hospital and Wright Patterson Air Force Base Hospital, to get a more comprehensive understanding of the clinical experiences available to Wright State University Internal Medicine Residents.

#### **Factors Predicting Discharge to an Extended Care Facility following Distal Femur Fractures**

Michael A. Boin, MD; Shankar Narayanan, BS; Dana Duren, PhD; Jessica Lee, MD; Matthew A. Dorweiler, MD; Andrew Froehle, PhD; Richard T. Laughlin, MD

*Presenting Author:* Shankar Narayanan

*Faculty Mentor:* Richard Laughlin, MD

*Mentor's Department:* Orthopaedic Surgery

*Poster Number:* 5

**Research Question/ Objective:** To identify patient factors that reliably predict the need for admission to an extended care facility (ECF) following distal femur fractures. **Background:** Delayed identification of patients requiring admission to an extended care facility (ECF) following traumatic orthopaedic injuries is leading to nonmedical delays in discharge, and unnecessary use of patient care resources and healthcare expenses. Arthroplasty and hip fracture literature has attempted to identify patient factors that can predict which patients may require discharge to an ECF. Currently, the literature is lacking in studies applying this same principle in other traumatic orthopaedic injuries. The aim of this study is to identify patient factors that reliably predict the need for admission to an ECF following distal femoral fractures. **Methods:** A retrospective chart review was performed on patients admitted to the orthopaedic trauma service at a single urban trauma center. Patients with a diagnosis of distal femoral fracture between the years of 2011-2014 were included in the study. A total of 176 patient charts

were reviewed. Patient exclusion criteria included: those who died during admission, patient age <50, polytrauma patients, non-operative distal femur fractures, and distal femur fractures due to a gunshot wound. Discharge disposition to an ECF, patient age, gender, body mass index (BMI), hospital length of stay, payer source, presence of end-stage renal disease (ESRD), diabetes, admission hemoglobin value, American Society of Anesthesiologists (ASA) score, surgical procedure, Orthopaedic Trauma Association (OTA) fracture classification, periprosthetic fractures, and post-operative weight bearing status were the variables analyzed. Discriminate function analysis was used to determine a linear function of clinical values that can be used to predict whether a patient with a distal femur fracture is likely to need to be sent to an ECF following their hospital stay. **Results:** 71 patients, 23 men and 48 women, were included in the final statistical analysis. Of these patients, 11 men (48%) and 40 women (83%) were discharged to an ECF following their hospital stay. Discriminant function analysis of the data for men and women demonstrated that a higher ASA score ( $p<0.001$ ), higher BMI ( $p<0.02$ ), the presence of diabetes ( $p<0.03$ ), and periprosthetic fractures ( $p<0.04$ ) for men, while a higher ASA score ( $p<0.001$ ) and a lower admission hemoglobin value ( $p<0.05$ ) for women were the most important variables in the predictive model for discharge to an ECF. Using the discriminate function analysis and a leave-one-out validation we were able to develop a predictive equation that correctly classified 95.7% of men and 81.3% of women as requiring discharge to an ECF. **Conclusion:** We were able to identify patient factors that predicted discharge to an ECF. By using the predictive equation we were able to correctly identify the vast majority of patients that required discharge to an ECF. Using this equation, patient care providers may be able to identify which patients will require ECF admission early in the hospital stay. This will enable earlier discharge planning and lead to decreased nonmedical discharge delays.

### **Time to Diagnosis of Autism Spectrum Disorder**

Erin Nealon; Craig Boreman, MD; Adrienne Stolfi, MSPH; Shalini Forbis, MD, Caitlyn McComb

*Presenting Author:* Erin Nealon

*Faculty Mentor:* Craig Boreman, MD

*Mentor's Department:* Pediatrics

*Poster Number:* 34

**Research Question/ Objective:** The primary objective of our study will be to determine the time intervals in the process of diagnosing autism spectrum disorder (ASD). This project will focus on answering the following questions: 1. What was the average age of the child when parents first had concerns, and what were the initial symptoms? 2. At what age was the child referred to a specialist for further evaluation, and who is making the referrals to specialists? 3. At what age is the child diagnosed, and what is the time lapse between referral and diagnosis? 4. What additional referrals were made once diagnosed (i.e. speech, hearing, etc.)? How do these compare to referrals made prior to seeing a specialist? **Background:** Multiple studies have analyzed the age at which children are diagnosed with ASD and many have searched for factors that delay and enhance the diagnostic process. However, there is great variability among research on this topic. This reinforces the need for evaluation of the patient population here in Dayton to focus on this region's population. This will allow targeted education and intervention to ultimately improve patient care with more rapid treatment, thus better outcomes. **Methods:** Patients for this retrospective chart review were pulled from the database at Dayton Children's Hospital (DCH). The criteria for patient inclusion were ASD as the reason for referral and a referral between January 2014 and December 2014. A chart review was performed with both electronic and paper charts using a standardized Chart Review Form. Data collected via chart review included information on presentation to clinic, patient diagnoses, and referral data. Statistical significance was defined as a p value less than 0.05. **Results:** This study included 106 patients, 49 who were given a diagnosis of ASD and 57 who were given no diagnosis or a diagnosis other than ASD. On average, parents reported their initial concerns about their child began at the age of 1.8 years, while the average age at the time of referral to a

developmental-behavioral specialist was 3.0 years. Among pediatricians, pediatric nurse practitioners, and family medicine physicians, there was not a significant difference in the age at referral ( $p=0.469$ ). Language delay was documented as an initial symptom in 100% of the patients who were given an ASD diagnosis and 78.9% of those who were not ( $p<0.001$ ). Stereotyped behaviors were reported in 61.2% and 40.4% of those with and without ASD, respectively ( $p=0.032$ ). Behavior problems were reported in 36.7% of patients with ASD and 70.2% of patients without ASD ( $p=0.001$ ). The average time from referral to a specialist to the first visit was 21.1 weeks, and the average time from the first visit to receiving a diagnosis was 2.0 weeks. Among all patients in this study, the average age at the time of diagnosis was 3.5 years. Referrals for therapy following diagnosis were then compared to those made by the primary care provider prior to the specialist's evaluation. Among all patients, there was a significant decrease in the number of patients who had no referrals. In the group diagnosed with ASD, 28.6% of children had no referrals by their PCP, compared to 0.0% without any therapy referrals after seeing the developmental-behavioral pediatrician ( $p<0.001$ ). In the group without an ASD diagnosis, the percent without any referrals went from 45.6% to 8.8% ( $p<0.001$ ). There was also a significant increase in the number of patients who were given a speech referral in both groups (prior to specialty evaluation compared to after evaluation), increasing from 53.1% to 95.9% ( $p<0.001$ ) in patients with ASD, and increasing from 31.6% to 64.9% ( $p<0.001$ ) in patients without ASD. Special education referrals also increased significantly for all patients. This increased from 24.5% prior to evaluation to 91.8% after evaluation ( $p<0.001$ ) in the group with ASD, and 10.5% prior to evaluation to 49.1% in the group without ASD ( $p<0.001$ ). Furthermore, this data showed a significant increase in the number of referrals to occupational therapy for patients with ASD (16.3% to 53.1%, where  $p<0.001$ ). Among patients without a diagnosis of ASD, there was a significant increase in the number of referrals to behavior management (1.8% to 19.3%, where  $p=0.002$ ). **Conclusion:** This study, specific to Dayton, demonstrates that referrals to a specialist are being made appropriately, as nearly half of patients referred received a diagnosis of ASD and nearly all had referrals for treatment or therapy of

some kind. The gap between initial concerns and provider referral is important to be aware of because it may suggest a communication barrier between parents and primary care providers that is preventing children from being referred to the specialist. The study shows that there is not a significant difference in the provider type who is making the referral, and therefore, provider education does not need to be directed towards one provider type. The data regarding initial symptoms can be used for educational purposes as a guide for parents and primary care physicians, with language delay and stereotyped behaviors suggesting a possible ASD diagnosis and behavioral problems more likely suggesting an alternative diagnosis. Another important result from this study showed a significant delay between the time of referral and first visit with the specialist, which reinforces the need for the new Autism Diagnostic Center at DCH. The referral data comparing prior and new referrals is important for focusing educational efforts towards primary care providers. An emphasis should be placed on ensuring the appropriate and ample use of speech and special education referrals. Additionally, primary care providers should also be aware of the greater need for occupational therapy among those with ASD and behavior management among those without ASD. Using this study, the Autism Diagnostic Center at DCH can focus on educating the community and improving its internal process in order to reach a more rapid diagnosis and ensure adequate therapy or treatment for all patients.

#### **Preliminary Findings Regarding Patients' Attitudes Towards Genetic Carrier Testing (GCS)**

Allison Briggs, DO; Parvaneh Nouri, BS; Jerome L. Yaklic, MD; Rose Maxwell, PhD; Kathleen O'Leary, MD; Steven R. Lindheim, MD, MMM

*Presenting Author:* Parvaneh Nouri

*Faculty Mentor:* Steven R Lindheim, MD, MMM

*Mentor's Department:* Obstetrics and Gynecology

*Poster Number:* 59

**Research Question/ Objective:** We evaluated the impressions and attitudes among women regarding preconception GCS and factors that may influence decision-making. **Background:** Genetic Carrier Screening (GCS) is an important part of

gynecological practice and is considered an important component of preconception planning. As technology evolves and access to testing increases with GCS, there are potential ethical quandaries that need to be addressed. **Methods:** A survey of 32 questions was given to 351 OB-GYN patients addressing their attitudes towards decision-making regarding GCS in a family planning context. Data are reported descriptively. **Results:** Patient awareness of access to GCS was 48% (n=166). Though most reported feeling positive or neutral towards GCS, 54% (n=180) reported no desire for testing. Further, 52% (n=182) of patients stated they would never undergo an elective termination regardless of abnormal genetic findings. 58% (n=202) felt it would be beneficial to know their carrier status, and 51% (n=180) felt it was their responsibility to undergo testing to ensure her child did not suffer from a genetic disorder. With respect to cost, 48% (n=167) would be willing to pay \$50-100 for testing, while 28% (n=100) would not pay out of pocket. **Conclusion:** Our preliminary data show that many patients are unaware of GCS, believed it would be beneficial to know their carrier status and that it was their responsibility to undergo testing. However, most did not want to undergo GSC and less than half were willing to pay out of pocket. Increased education is necessary to reconcile the gap between technology and patient decision-making.

#### **Expanded Genetic Carrier Screening (E-GCS) in Clinical Practice: A Current Survey of Physician Impressions and Attitudes**

Allison Briggs, DO; Parvaneh Nouri, BS; Kathleen O'Leary, MD; Jerome L. Yaklic, MD; Rose Maxwell, PhD; Steven R. Lindheim, MD, MMM

*Presenting Author:* Parvaneh Nouri

*Faculty Mentor:* Steven R Lindheim, MD, MMM

*Mentor's Department:* Obstetrics and Gynecology

*Poster Number:* 60

**Research Question/ Objective:** We evaluated current physicians' attitudes towards GCS and E-GCS to assess current practice and areas that need improvement. **Background:** Carrier screening for inherited genetic diseases is an important component of preconception and prenatal care to identify couples at risk for passing on a genetic condition to their offspring. Today, high-

throughput genotyping and sequencing approaches have changed the landscape allowing for cost-effective and efficient screening of multiple conditions simultaneously (E-GCS) that may have significant variation in their presentation. Given the complexity of E-GCS and given most providers have no formal training in genetic testing, new challenges arise regarding patient management and medical ethics including patient autonomy. **Methods:** The 32-question survey was given to 195 OB-GYN providers between the ages of 26 and 76. The survey addressed factors that affect physician attitudes and practices towards GCS and E-GCS. Data were grouped and analyzed based on previous and current practice. **Results:** Compared to 5 years ago, 98.5% (n=192) vs 95% (n=177),  $p<0.07$  offered pan-ethnic or E-GCS; 21% (n=42) vs 13.3% (n=26),  $p<0.03$  offered prior to conception; 28.2% (n=55) vs 17.4% (n=34),  $p<0.01$  offered after conception. Currently, E-GCS was offered to 16.9% (n=33) patients, while pan-ethnic carrier testing is done in the majority of cases 47.6% (n=93). Thirty-six percent (n=71) of physicians state that patients at risk based on family and ethnicity should be offered genetic carrier screening, but only 2.6% (n=5) believe that all patients should receive GCS. GCS was more likely to be discussed during fertility (51.2%, n=100) and post-miscarriage visits (44.6%, n=87) compared to contraceptive counseling appointments 22% (n=43) and annual well woman exams 12.8% (n=25). Ideally, 57.4% (n=112) believe GCS should be offered during pre-conception counseling, 34.3% (n=67) early in pregnancy.. In current practice, 68.2% (n=133) state that GCS is addressed by the physician, but only 56.4% (n=110) are comfortable counseling on GCS ( $p<0.05$ ), and only 30.2% (n=59) are comfortable discussing a positive screening result ( $p<0.05$ ). With respect to E-GCS, 54.3% (n=106) state that testing should not be offered until the clinical significance of each disease is fully understood, while 28.2% (n=55) state that it should be offered regardless,  $p<0.05$ . **Conclusion:** Overall, the number of patients offered GCS prior to and post conception has significantly increased in the past 5 years and most believe should be offered during preconception family planning meetings, but not until the clinical significance of all genetic variations are fully understood While the majority of physicians in the office setting counsel on GCS, most physicians are



not comfortable counseling on GCS or in discussing positive results. Continued education and training programs are warranted to implement E-GCS in routine practice.

**Preliminary Findings on the Influences of Ethnicity on Perceptions of Contraceptive Use in Post-Partum Women with Unintended Pregnancies in an Urban Mid-West Setting.**

Katherine Ochs; Brittainy Erby; Heather Skanes-DeVold, MD; Steven R. Lindheim, MD MMM; Janice Duke, MD; Candice Benoit, MD; Jerome L. Yaklic, MD; Rose Maxwell, PhD

*Presenting Author:* Katherine Ochs and Brittainy Erby

*Faculty Mentor:* Steven R. Lindheim, MD

*Mentor's Department:* Obstetrics and Gynecology  
*Previous submission:* 71st American Society of Reproductive Medicine, Baltimore, MD, October, 2015 and 28th Annual Curtis L. Parker Student Research Symposium, Atlanta, GA 2016 Graduate Medical Education Award

*Poster Number:* 25

**Research Question/ Objective:** Although progress has been made to reduce unintended pregnancies (UIP) in the United States, rates remain relatively high. Previous studies have shown that women in minority groups are less likely to use contraception. Our research objective was to assess knowledge and attitudes associated with pre-conception and postpartum contraception use in UIP in an urban based setting. **Background:** Unintended pregnancy (UIP) rates account for 51% of pregnancies, which has not changed since 2001. Risk factors include younger age, lower education level, relationship status, and minority populations. Consequences of UIP are delays or insufficient prenatal care, increased infant mortality, risk of physical violence, and maternal depression, and decreased rates in breastfeeding. UIP are estimated to cost 11 billion dollars annually. **Methods:** A 21-question survey was given to 72 women between the ages of 18 and 35 within 24-48 hours of delivery. The survey addressed factors that influenced their birth control use prior to pregnancy as well as plans for post-partum contraception. Data from unintended pregnancies were grouped and analyzed based on age and ethnic background. **Results:** Our sample population for women with

UIP (n=39) was 46% Caucasian (CA) and 54% African American (AA). There was no significant difference in educational level or access to care between ethnic groups. Overall, 72% had some level of college education and 66% had access to contraception with partial-to-complete insurance coverage (p-NS). Despite the majority of participants having access to care, 54% of participants had not used any form of contraception prior to conception, and this was equally distributed across ethnic groups. Overall, negative perceptions of birth control were similar across ethnic backgrounds including most commonly weight gain (CA-72%; AA-71%; p-NS). However, significant differences in positive perceptions were noted including: 24% of AA could not identify any benefits of contraceptives, while all CA could identify at least one benefit (OR 111.0; 95% CI 5.7-2164, p<0.001). A significantly greater proportion of CA believed contraception reduced menstrual pain (OR 4.0, 95% CI 1.05-15.2, p<0.05) and acne (OR 43.0; 95% CI 2.26-817.1, p<0.05) compared to AA. AA were less likely to believe that birth control would prevent further UIP than CA (OR 16.0; 95% CI 2.84 to 90, p<0.01). Despite their recent UIP, 13% of females stated they were not likely to use any form of contraception post-partum, though no significance between ethnic groups was noted. **Conclusion:** Our preliminary data shows a disproportionate lack of positive perceptions regarding contraception among AA participants, which may be a factor leading to its non-use and subsequent UIP in this population. Understanding the skepticism among AA women regarding birth control's effectiveness in preventing pregnancy is the first step to the development of a culturally targeted educational program and interventions to reduce UIP.

**Physician Communication Strategies Regarding Pediatric Obesity**

Anthony Oddo; James Ebert MD, MPH

*Presenting Author:* Anthony Oddo

*Faculty Mentor:* James Ebert MD, MPH

*Mentor's Department:* Pediatrics

*Poster Number:* 36

**Research Question/ Objective:** To evaluate the previous experiences parents have had in discussing the weight of their children with physicians and to

identify their ideal conversations regarding the topic. **Background:** There is limited qualitative research on the type of weight management counseling parents of pediatric patients prefer from their physicians and whether preferences differ by demographic information. **Methods:** This is a qualitative study of 16 parents accompanying their children to appointments at a pediatric hospital-based Lipid Clinic. Semi-structured interviews were used to guide discussions about weight management counseling. Major topics included 1) previous conversations with physicians about their child's weight 2) parent terminology preference in reference to discussing the weight of their children and 3) the parents' opinions of ideal discussions with physicians about their children's weight. Data were analyzed using a grounded theory approach and thematic trends were analyzed. **Results:** Parents' reflections of their discussions about the weight of their children with physicians demonstrated similar experiences and a consensus of opinions. Of the 16 interviewees, 15 were female, 9 were over the age of 44, 11 had some college education or higher, 12 were white, 7 were married, all identified as the primary caregiver, and their children ranged from 3 less than ten years old, to 9 over age fourteen. A majority of parents recalled not only descriptive conversations, but also the use of charts and measurements. Parents internalized the various terms used in describing their children's weight in consistent patterns, such as a negative relation to the word 'fat.' Most parents mentioned the use of either/both of the terms 'obese'/'overweight' in previous encounters with physicians. Despite the fact that doctors use these terms as categories of BMI, most parents recognized the words as descriptive terms and displayed a clear preference for 'overweight' rather than 'obese.' Overall, parents desired similar physician communication and weight management counseling: (1) discussing weight in a nonjudgmental and straightforward manner, (2) offering specific tools, such as diet and exercise strategies, and (3) using encouragement to develop self-directed skills for healthy weight management. **Conclusion:** While reflecting upon previous experiences and describing ideal interactions with physicians in discussions about their children's weight, parents have fewer preferences about specific term use and more preferences regarding how a physician delivers their message. This

information can be shared with physicians in order to develop more successful approaches to discussing and to treating pediatric obesity.

### **Pheochromocytoma and Paraganglioma: A Literature Review and Case Study**

Molly Osterhage; Casey T Walk; Malvika Sharma; Rouzbeh R Ahmadian MD; Arturo Aranda MD; Jeffrey Pence MD; David Meagher MD

*Presenting Author:* Molly Osterhage

*Faculty Mentor:* David Meagher MD

*Mentor's Department:* Pediatric Surgery

*Poster Number:* 24

**Research Question/ Objective:** The objective of this report is to review the current literature concerning. Pheochromocytomas and

Paragangliomas and present the most current diagnostic and treatment methods while also presenting a case of a 14 year old female treated for the disease. **Background:** Pheochromocytomas and Paragangliomas (PHE/PGL) are exceedingly rare neuroendocrine tumors that are found along the sympathetic chain in the neck, chest or abdomen.

**Case Presentation:** Here we present a review of the literature concerning the presentation, diagnosis, and treatment of PHE/PGL and a case of a 14 year old female with seizure disorder who was found to have a 6cm non-functioning extra-adrenal PHE/PGL in the posterior mediastinum presenting with back pain. Her pre-operative and intra-operative diagnoses were incorrect and her excision was with positive margins. Patient's post-operative course was unremarkable. Final pathology was diagnostic, and genetic testing revealed her to have an apparently de novo SDHB mutation. Her follow-up regimen will be discussed here including the use of laboratory and imaging modalities for diagnosis of recurrence or malignant disease. **Discussion:** PHE/PGL is a rare disease that requires specific diagnostic and treatment regimens. This disease has an increasing relation to genetic factors, which are now becoming utilized as a diagnostic tool. The therapy and procedure implemented as treatment depends on many diagnostic factors, such as location, age, size, and details of pathology. Our patient had a de novo genetic mutation of the SDHB gene, common in PHE/PGL and was treated surgically without complications. **Clinical**

**Relevance:** Approximately 10% of all PHE/PGL

present in the pediatric population, making their diagnosis and treatment a rare event. When they do occur, specific diagnostic and treatment regimens must be implemented.

### **Improving Vitamin D Testing in Patients with Osteoporosis**

Kasey Parker; Sonia I. Bennett, MD, MPH; Ronald J. Markert, PhD

*Presenting Author:* Kasey Parker

*Faculty Mentor:* Ankur Gupta, MD

*Mentor's Department:* Internal Medicine

*Poster Number:* 40

**Research Question/ Objective:** Optimum Vitamin D levels are essential for effectiveness of bisphosphonate therapy. Our goal was to assess whether there is a need to develop an order set linking vitamin D lab testing with an osteoporosis medication order. **Background:** Vitamin D deficiency has been associated with an increased risk of hip and non-vertebral fractures. Serum 25-hydroxy vitamin D (25(OH)D) level is the diagnostic test of choice to assess vitamin D status. The American Association of Clinical Endocrinology recommends maintaining a 25(OH)D level between 30-60 ng/ml for bone health. The Endocrine Society guidelines for the management of osteoporosis recommends a target 25(OH)D level of 30 ng/ml for men at high risk of fracture. Maintaining optimal vitamin D level is also essential for the effectiveness of osteoporosis treatment. Bockman et al. found that a 25(OH)D level > 33 ng/ml was associated with a 4.5 to 7 fold increase in the likelihood of a favorable response to bisphosphonates. In order to assess whether there is a need to develop an order set linking vitamin D lab testing with an osteoporosis medication order, we initiated a quality improvement study at the Dayton VA Medical Center. **Methods:** We reviewed the vitamin D status in all the patients at the Dayton VAMC and its supported community based outpatient clinics who were prescribed various osteoporosis medications (alendronate, risendronate, ibandronate, calcitonin, or raloxifene) in the last year. Each patient's demographic and clinical data including type of osteoporosis medication were obtained. Specifically, we attempted to determine whether vitamin D levels were checked within the twelve months prior to or

at the time of initiation of osteoporosis treatment.

**Results:** Records were reviewed for a total of 253 veterans. The mean age of veterans receiving osteoporosis medication was 65 years (range 42-95). Of these, 77.1% were men and 22.9% were women. Indications for therapy included osteoporosis prevention (6.3%), osteopenia (24.5%), osteoporosis (68.8%), and avascular necrosis (0.4%). The majority of veterans were initially prescribed alendronate (94.5%). Other medications included risedronate (3.2%), calcitonin (1.6%), raloxifene (0.4%), and ibandronate (0.4%). Only 24.11% patients had serum vitamin D levels checked in the twelve months preceding or at the time of treatment initiation. Among veterans with vitamin D levels, 42.6% patients had a vitamin D level > 30 ng/ml and only 29.5 % had a vitamin D level > 33 ng/ml.

**Conclusion:** Based on our assessment we have identified a need to improve the process of vitamin D assessment and treatment for veterans receiving osteoporosis medications in our facility. The process will involve creating an order set linking vitamin D testing to osteoporosis medications along with an educational component regarding its significance. After the implementation of the order set, we plan to review the impact of the improvement.

### **Iron Deficiency Causing Abnormal Thyroid Function**

Kasey Parker; Sonia I. Bennett, MD, MPH

*Presenting Author:* Kasey Parker

*Faculty Mentor:* Ankur Gupta, MD

*Mentor's Department:* Internal Medicine

*Poster Number:* 41

**Research Question/ Objective:** Explore the role of iron deficiency in hypothyroidism and the utility in treating iron deficiency before treating hypothyroidism. **Background:** Iodine deficiency is a known cause of hypothyroidism, however it is not well recognized. We describe a young woman presenting with abnormal thyroid function due to iron deficiency. **Case Presentation:** An 18-year-old Caucasian female with past medical history of facial acne presented to the endocrinology clinic for evaluation of abnormal thyroid function studies and pituitary tumor. The patient had acne issues since age eleven. She was being treated with oral

contraceptive pills (OCP) and spironolactone. At age 16, she was noted to have normal serum TSH (2.3 mIU/ml) and low free T4 (0.8 ng/dl) using direct chemiluminescence immune assay. Repeat labs ten days later showed similar results with low free T4 (0.87 ng/dl). Free T4 was then measured by direct dialysis method which is a more accurate method as it eliminates the possibility of interference by other binding proteins in the serum not accounted for in the usual automated analog immunoassay. Serum free T4 by direct dialysis method was normal (1.1ng/dl). At age 18, she underwent repeat thyroid function tests, when she was noted to have low TSH (0.2 mIU/ml), normal free T4 (0.98 ng/dl) by electrochemi-luminescence method but low serum free T4 (0.66 ng/dl) with direct dialysis method. The patient's primary care provider obtained an MRI of the pituitary gland to evaluate for central hypothyroidism. MRI showed a 9 mm pituitary tumor between the adenohypophysis and neurohypophysis suggestive of Rathke's cleft cyst vs. pituitary microadenoma. She was then referred to the endocrinology clinic. On interview, she endorsed occasional mild headache relieved with ibuprofen. She denied galactorrhea, dizziness, or excessive urination. On exam, she was noted to have multiple acne lesions on the face. Thyroid gland and the rest of exam were unremarkable. Repeat labs showed normal TSH (2.2 mIU/ml) but low free T4 (0.9 ng/dl) by electro chemiluminescence assay as well as low free T4 (0.7 ng/dl) with direct dialysis assay. Iron studies were also obtained and she was diagnosed with iron deficiency (serum ferritin <40 ng/ml). Other hormonal biochemical work up for pituitary tumor was unremarkable. She was started on oral ferrous sulfate 325 mg twice daily. On subsequent labs, her iron deficiency resolved and her free T4 level improved to normal when tested on multiple occasions without any abnormal values on either free T4 assay. Repeat MRI of the pituitary at six months demonstrated stability of the pituitary tumor. **Discussion:** Iron deficiency is common in young women due to blood loss from menstruation. The two initial steps in thyroid synthesis are catalyzed by a heme-containing enzyme called thyroid peroxidase. Thus, iron deficiency may result in reduced thyroid peroxidase activity contributing to hypothyroidism. Animal studies have reported low thyroxine levels associated with iron deficiency. A Chinese population study noted

that prevalence of iron deficiency was higher in young pregnant and non-pregnant women with isolated hypothyroxinemia. **Clinical Relevance:** We present an interesting case in which treatment of iron deficiency normalized thyroid hormone abnormalities. Iron deficiency should be considered in patients presenting with abnormal thyroid function, especially in cases of isolated hypothyroxinemia, before pursuing expensive diagnostic tests or thyroid hormone supplement.

**Herpes Simplex Virus 2 Myelitis—A wolf in sheep's clothing. Case Report of Immunocompetent Patient with Ascending HSM diagnosed by CSF-PCR.**

Kazia Parsons; David Cook; Bradley Jacobs, MD, MS; Thomas Pitts, MD; Capt. Jonathan Pollock, USAF, MD

*Presenting Author:* Kazia Parsons

*Faculty Mentor:* Bradley Jacobs, MD

*Mentor's Department:* Neurology

*Poster Number:* 50

**Research Question/ Objective:** A Case Report of an immunocompetent patient who presented with ascending paresthesias and weakness diagnosed with Herpes Simple Virus 2 Myelitis (HSM) by CSF-PCR. Demonstrating the importance of appropriate diagnosis and treatment of HSM, a rare manifestation of HSV2 classically seen in immunocompromised patients, which may progress to a fatal form of acute ascending necrotizing myelitis. **Background:** Herpes Simplex Virus 2, is a member of the human herpesvirus family most commonly associated with genital herpes, which manifest in outbreaks of clusters of painful genital or anal ulcerations. It may be accompanied with systemic symptoms such as malaise, fever, or lymphadenopathy. However, in rare cases, HSV 2 infection can manifest in serious and potentially fatal conditions such as HSV 2 Myelitis (HSM), which can progress to acute ascending necrotizing myelitis in immunocompromised hosts. HSM can present as an ascending sensory-motor disturbance in the lower limbs, often with bladder involvement, which may progress to the cervicothoracic spinal cord, leading to quadriplegia, encephalitis, respiratory failure and often death. These early symptoms of ascending sensory-motor disturbances can mimic Guillain-Barré Syndrome

and other central nervous conditions. It is important to distinguish between the two and recognize HSM as failure to treat is almost universally fatal. **Case Presentation:** A 29-year-old female with history of bilateral pulmonary emboli and HPV presented with paresthesias and weakness for 3 days duration, which began in bilateral feet and had since progressed with paresthesias ascending to “waist line” and weakness ascending to bilateral thighs. On second day of symptoms patient also began to experience low back pain, difficulty walking due to weakness, and difficulty initiating urine stream. Patient reported sinus infection 2 weeks prior. At end of hospital day 0, patient reported new onset headache described as occipitocoronal and throbbing but devoid of migrainous features. Patient denied fever, chills, malaise, nausea, vomiting, sick contacts, previous history of sexually transmitted diseases, and previous genital lesions. On exam patient was alert and oriented X4 with no cognitive defects. Neurological examination showed 4/5 strength in right knee extensors and flexors but 5/5 in all other muscle groups. Sensory and complex motor examinations were intact with no level detected. Reflexes were 2/4 throughout with exception of left ankle being 1/4 with no clonus, toes downgoing. Gait showed normal stance, good initiation, but reduced arm swing, stride length, and patient was unable to look forward, with 2 steps to turn. The rest of the exam was within normal limits. MRI head and total spine were ordered and read as normal scan with no lesions noted. Lumbar puncture was then performed and CSF sent for cytology, cell count, gram stain, culture, PCR viral panel (including HSV, HIV), and RPR. Significant results of CSF were reported as follows: Protein 159, Glucose 51, WBC 1028, RBC 10, Segs 2, Lymphs 97, GM stain negative, culture no growth, PCR positive for HSV2 DNA, negative for HIV/RPR. Patient was treated with high dose IV Acyclovir. On day 3 of treatment patient reported full return of strength and was 5/5 on exam with loss of paresthesias at rest and only mild paresthesias in bilateral feet after prolonged walking during therapy. **Discussion:** Due to the variability of clinical presentation and MRI results, it is critical to have a high suspicion for HSM in patients with ascending sensory-motor disturbances in order to obtain lumbar puncture and CSF-PCR for HSV. MRI findings can include spinal lesions that are either hypointense or

isointense on T1 images, which can appear similar to MRI findings in HSV encephalitis. However, lesion density can vary from case to case or be completely absent. Therefore HSV-DNA PCR of CSF is generally accepted as the gold standard in definitive diagnosis of nervous system viral infections. CSF-PCR sensitivity and specificity are reported as 98 and 94% respectively, with positive and negative predictive values of 95 and 98%. In our case, our patient had no encephalopathic features, normal imaging, and relatively unremarkable physical exam. This made PCR evaluation of her CSF vital to the diagnosis. Another unique aspect of this presentation was that the patient was immunocompetent. Reported cases of HSM are rare and usually found in patients that are immunocompromised, with the majority of cases reported in HIV patients. Immunological status was determined to play a large role in pathogenesis. One study which conducted an autopsy of 8 patients with HSM showed necrosis and cellular changes in the dorsal nerve roots and dorsal root ganglia. These results they concluded suggested that the pathogenesis stemmed from reactivation of the latent virus in the dorsal spinal nerve roots which then traveled to the spine in the immunocompromised host. Case reports of HSM in immunocompetent patients were unable to be found. Once diagnosis is established, it is vital to start treatment with high dose IV acyclovir until symptoms improve then Valtrex 1g BID/TID for 7-10 days with follow up lumbar puncture to ensure viral clearance. **Clinical Relevance:** The poor prognosis of untreated HSM in conjunction with the wide clinical variability demonstrates the importance of maintaining a suspicion of HSM in patients with sensory-motor disturbances. Variation in imaging results has made PCR-CSF the gold standard of diagnosis. Without adequate and timely treatment HSM can progress to acute ascending necrotizing myelitis, which is almost universally fatal or in best cases leaves patients with severe lifelong deficits. However, when diagnosed early HSM can be treated with high dose IV acyclovir with complete resolution or minimal residual symptoms.

## **Features of Trauma— Diaphragmatic Injuries at a Level I Trauma Center**

Brian Patterson; Aaron Hollis Palmer; Peter Ekeh, MD, MPH, FACS

*Presenting Author:* Brian Patterson

*Faculty Mentor:* Peter Ekeh, MD

*Mentor's Department:* Surgery

*Previous submission:* Oral Presentation at Academic Surgical Congress Jacksonville, FL February 2016

*Poster Number:* 42

**Research Question/ Objective:** The purpose of this retrospective study is to document and quantify diaphragmatic injuries and their related complications at a Level I Trauma Center over an 8 year period (January 2004 – December 2011). The data analysis will characterize diaphragmatic injuries and will lead to better surgeon appreciation and response to diaphragmatic trauma cases.

**Background:** Injuries to the diaphragm are rare events that typically require operative intervention, can occasionally be difficult to identify by current imaging techniques, have a higher occurrence with blunt mechanisms and are more predominant on the left side. We reviewed a single center's experience with these injuries to determine if the patterns of presentation have evolved from reported historical trends. **Methods:** All patients that sustained diaphragmatic injuries and presented to an American College of Surgeons verified Level I Trauma Center over an 8 year period (January 2004 – December 2011) were identified from the Trauma Registry. Demographic data, mechanism of injury, associated injuries, laterality, method of diagnosis, length of stay, mortality and other data points were abstracted from the patient records. Comparisons where necessary were performed by Student t-test and analysis of variance (ANOVA) for continuous variables and Fishers exact test for categorical ones.

**Results:** In the studied time period, there were 23,578 trauma admissions with 126 patients identified with diaphragmatic injuries. These represented 0.53% of all trauma admissions. The mean age was 37.0 years and 82% were male. Motor vehicle crashes (MVCs) - 40.5%, gunshot wounds - 36.5%, and stabbings - 11.1% were the most common etiologies of injury. Blunt mechanisms overall represented 50.8% with a mean Injury Severity Score (ISS) of 32.9. Penetrating

mechanisms occurred in 49.2% (mean ISS 21.5) Left-sided diaphragmatic injuries (65.9%) were more common than right sided (25.4%) and 7.9% were bilateral. Exploratory laparotomy was the most frequent method of diagnosis (45.2%). Chest X-ray (18.3%), CT (15.1%), Thoracotomy (6.3%) and Laparoscopy (4.8%) were the other diagnostic methods. Delayed diagnosis (>12 hours) occurred in 14.5% of patients with 10.3% of these found at autopsy. The overall mortality rate was 30.2%. Mortality was higher in blunt trauma - 40.6% vs. 19.4% in penetrating trauma. (p= 0.012) Patients who were stabbed had the lowest mortality rate (0%) while pedestrians in MVCs had the highest (80%). The laterality of the injury had no effect on mortality. **Conclusion:** Diaphragmatic injuries are uncommon and can occasionally present a diagnostic challenge with delayed diagnosis –as seen in 14.5% of patients in this series. Left sided injuries predominate and mortality is higher with blunt trauma mechanisms – related to associated injuries. Exploratory laparotomy remains the most frequent method of diagnosis. Our findings are consistent with prior series in the literature with no major shifts in trends noted. Mechanisms due to penetrating injuries are higher in our study than has been historically reported. No optimal imaging diagnostic technique has emerged for diaphragmatic injuries and a high index of suspicion remains necessary to avoid delayed diagnoses and missed injuries.

## **Should Extraperitoneal Bladder Injuries Be Repaired at the Time of Pelvic Examination?**

Kevin Purcell; Alison M. Bales BA; Julie Ferraiola MD; Michael J. Prayson MD; Diane M. Kimpel, APRN; MS, Ronald J. Markert PhD; Gregory Semon DO; A.P. Ekeh MD, FACS; Mary C. McCarthy MD, FACS

*Presenting Author:* Kevin Purcell

*Faculty Mentor* Mary C. McCarthy, MD, FACS

*Mentor's Department:* Surgery

*Previous submission:* American Academy of Dermatology, Washington DC, May 5, 2016

*Poster Number:* 18

**Research Question/ Objective:** Should Extraperitoneal Bladder Injuries Be Repaired at the Time of Pelvic Fixation? **Background:** Blunt pelvic fracture is the most common mechanism of

injury to the urogenital system. Intraperitoneal bladder injuries undergo prompt surgical repair, while extraperitoneal injuries are managed with Foley catheter drainage until healed. However, when pelvic fixation is performed in the retropubic space, the bladder injury plane is violated and the injury may be exacerbated. Whether it is beneficial to repair extraperitoneal bladder rupture at the time of pelvic fixation remains uncertain. **Methods:** All trauma patients over a 15-year period at a Level 1 Trauma Center with a lower genitourinary tract injury and pelvic fracture were identified. Trauma registry and chart reviews were performed; 29 patients with combined pelvic fracture and extraperitoneal bladder rupture were identified. Sequential treatment strategies were mapped to determine optimal management of these injuries. **Results:** The 29 patients included 12 women and 17 men, with mean age of  $39.14 \pm 18.3$  years, and injury severity scores of  $27.1 \pm 10.1$ . Twenty-four cases involved motor vehicles, and 2 patients died. Overall 4/10 (40%) of the repaired extraperitoneal bladder ruptures leaked and 6/19 (31.6%) of those managed by drainage alone leaked. Analysis of variables showed higher leak rates associated with open book fractures, anterior pelvic repairs, AAST bladder classifications  $\geq 3$ , and higher injury severity scores. **Conclusion:** Concurrent operative repair of the extraperitoneal bladder rupture and pelvic fracture did not result in a decrease in bladder leak on follow up cystogram. Multi-institutional studies are needed to solidify variables predictive of postoperative bladder leakage and optimal treatment strategies for this challenging combination of injuries.

#### **Provider Documentation Times**

Michael Robertson, MBA; Donald Clark, MD; Meagan Moe, B.S.

*Presenting Author:* Michael Robertson

*Faculty Mentor:* John Donnelly, MD

*Mentor's Department:* Family Medicine

*Poster Number:* 48

**Research Question/ Objective:** The objective was to decrease the documentation time length and thus the period of time that charts remained opened.

**Background:** Prior studies have shown charting time far less than what has been documented at this outpatient center (2.07 hours vs. 11.87 hours).

Considering delayed chart closure can lead to inaccurate documentation, lost billing, and inaccessible visit review for other providers among other issues to optimal patient care finding a method to decrease those times becomes increasingly important. **Case Presentation:** Time from chart opening till closure for each encounter was documented for the 6 months prior and following intervention. Medical providers were surveyed for common patient complaints where templates would be beneficial. The intervention was creating various "history of present illness" templates, and various "physical exam" templates for medical providers to utilize. **Discussion:** Time from chart opening till closure for each encounter was documented for the 6 months prior and following intervention. Medical providers were surveyed for common patient complaints where templates would be beneficial. The intervention was creating various "history of present illness" templates, and various "physical exam" templates for medical providers to utilize. **Clinical Relevance:** The introduction of templates did improve overall documentation time, but the average time till chart closure remains greater than 10 hours. This is in part due to only 4 out of 12 providers significantly decreasing charting time. Factors such as rapid physician turnover, potential differing template utilization rates, and irregular hours for all providers likely contributed to the large documentation times that remain.

#### **Increasing Depression Screening in a Suburban Family Medicine Clinic Using the PHQ2/PHQ9 Questionnaire: A Quality Improvement Project at Wright State Physicians**

Maggie Sullivan; Jaclyn Scholtz

*Presenting Author:* Maggie Sullivan

*Faculty Mentor:* Smita Krishnamurthy, MD

*Mentor's Department:* Department of Pathology

*Previous submission:* American Academy of Dermatology, Washington DC, May 5, 2016

*Poster Number:* 19

#### **Research Question/ Objective:**

To see if the percentage of patients screened for depression would be increased at Wright State Physicians after informing medical staff about the appropriate use of and the importance of the PHQ2/PHQ9 to screen for depression.

**Background:** In the US, depression has an estimated prevalence of 5.4-8.9%, with 50% of these patients receiving treatment from their family physicians. However, less than 50% of depression is accurately diagnosed in primary care patients. Furthermore, depression accounts for greater than 43 billion dollars in medical care costs and 17 billion in lost productivity annually. Depression is projected to become the second largest cause of disability by 2020. Depression is often not adequately treated and subsequently increases morbidity from diseases such as coronary artery disease, diabetes, and stroke. Treatment may reduce mortality both from decreased incidence of disease and improve treatment adherence. Accurately identifying patients who have depression is important so that appropriate treatment can be initiated. **Methods:** During our third year clinical rotation in family medicine at Wright State Physicians, we chose to initiate a quality improvement projection based on depression screening, one of many areas in which WSP measures in comparison to the Centers for Medicare and Medicaid Services' goal levels. USPSTF mentions that depression screening does not cause harm unless appropriate follow up is in place. At WSP, the EMR is equipped with the PHQ2-PHQ9 depression screening tools, which have been found to be sensitive and specific to diagnose depression when used in combination. We requested that all medical assistants at WSP include the PHQ2/PHQ9 during their initial encounter with patients to see if the percent of depression screenings at WSP increased in the given month. Results were obtained in Athena EMR. **Results:** Of the total number of patients seen at WSP in October 2015, 27% were screened with the PHQ2/PHQ9. This improved from 15% of patients screened from the month prior. **Conclusions:** After a simple educational intervention with the medical staff at WSP, depression screening using the PHQ2/PHQ9 was approximately doubled in a month. In order to continue to improve the depression screen rate, we propose that a number of additional interventions. These may include more rigid guidelines about whether to screen patients who have a history of depression/psychiatric disorders, use of PHQA in adolescent patients, providing an alert in the EMR to alert physicians to a positive screen, and ensuring that adequate social

support and resources are available to patients who may require further intervention.

**Combination therapy with thiopurines and allopurinol effectively limits hepatotoxicity and improves metabolite levels in pediatric inflammatory bowel disease**

Mark Serpico; Ross Maltz; Wallace V Crandall; Sandra C Kim; Jennifer L Doston; Brendan M Boyle

*Presenting Author:* Mark Serpico

*Faculty Mentor:* Brendan Boyle, MD

*Mentor's Department:* Pediatric Gastroenterology

*Poster Number:* 27

**Research Question/ Objective:** Does combination therapy with thiopurines and allopurinol effectively limit hepatotoxicity and increase thiopurine metabolite levels in pediatric patients with inflammatory bowel diseases who are preferential 6-MMP metabolizers? **Background:** The effects of thiopurines (6-mercaptopurine (6-MP) and azathioprine (AZA)) are mediated via their metabolism to metabolites 6-thioguanine (6-TG) and 6-methylmercaptopurine (6-MMP). Therapeutic efficacy in inflammatory bowel diseases (IBD) may be associated with adequate 6-TG levels while elevated 6-MMP levels are associated with hepatotoxicity. Preferential metabolizers of thiopurines to 6-MMP, resulting in hepatotoxicity and/or an inadequate clinical response, can limit their continued use. The addition of allopurinol has been shown to increase 6-TG levels while decreasing 6-MMP, and may be a reasonable approach to addressing the issue of preferential 6-MMP metabolism. We aimed to describe the impact on pediatric IBD patients with preferential 6-MMP metabolism of changing from standard thiopurine dosing to combination thiopurine/allopurinol upon hepatotoxicity and 6-MP metabolite levels after 6 and 12 months. **Methods:** We retrospectively reviewed patients aged 2-21 years with a diagnosis of Crohn's Disease (CD), ulcerative colitis (UC), or indeterminate colitis (IC) from January 2008 until July 2015 treated with thiopurines and allopurinol that were also naïve to anti-TNF therapy. Baseline demographic data, thiopurine dose, transaminase levels, 6-MP metabolite levels, and laboratory values were recorded from the visit nearest the



medication change, as well as from the visit nearest 6 months and 12 months following the change. **Results:** Fifty-two patients were identified (71% CD, 29% UC) with a mean age at medication change of  $14.3 \pm 2.9$  years. At baseline, mean 6-MP dose was  $1.37 \pm 0.25$  mg/kg/day. Mean ALT and AST values were  $80.1 \pm 71.6$  and  $45.8 \pm 22.7$  respectively. Mean 6-TG and 6-MMP levels were 206.5 and 10405.8 pmol/8x10E8. By 6 months, 42/52 of patients (81%) continued using 6-MP/allopurinol as primary therapy, 9 of which had advanced to anti-TNF therapy (17%). The mean 6 month thiopurine dose was 0.45 mg/kg/day, a reduction to 33% of original dose. Mean ALT and AST levels were reduced significantly to  $22.4 \pm 14.2$  and  $27.5 \pm 9.5$  ( $p < .0001$ ) respectively. Mean 6-TG levels were  $466.1 \pm 198.9$ , significantly increased from baseline levels ( $p < 0.0001$ ). 6-MMP levels in all patients had decreased with a maximum value of 2650 pmol/8x10E8. Physician Global Assessment data was available for 40 patients at 6 months with 31/40 (78%) in remission, compared to 50% in remission at baseline ( $p = 0.0075$ ). Steroid use was also significantly reduced in the 40 patients with evaluable data at 6 months compared to baseline (20% vs 68%) ( $p < 0.0006$ ). These changes in were maintained at 12 months, however an additional seven patients had advanced to anti-TNF therapy. **Conclusion:** In pediatric patients with preferential 6-MMP metabolism, we found thiopurine dose reduction combined with the addition of allopurinol was effective in normalizing transaminases, increasing 6-TG metabolite levels, and improving rates of remission at 6 and 12 months. 80% of patients continued thiopurine/allopurinol at 6 months without need for medication class change.

### **Improving Informed Consent for Patients Undergoing In Vitro Fertilization or Ovulation Induction and Intrauterine Insemination**

Maryam Shahin; Katherine Kerrigan

*Presenting Author:* Maryam Shahin

*Faculty Mentor:* Steven Lindheim, MD, MMM

*Mentor's Department:* Obstetrics and Gynecology

*Poster Number:* 3 **\*\*Digital Presentation\*\***

**Research Question/ Objective:** 1. Assess patients'/partners' understanding of the treatment of assisted reproductive technology (ART) using an Assisted Reproductive Technology Insight Screening Tool (ARTIST). 2. Compare our current informed consent process to an interactive electronic module consenting process to assess its benefit for patient understanding. **Background:** The procedures of Ovulation Induction and Intrauterine Insemination (OI-IUI) and In Vitro Fertilization (IVF) have multiple medical risks and ethical considerations including the right to self-determination and final decisions that must take into account what is appropriate and acceptable treatment in the patient's and partner's care. To achieve these ends, prospective patients/couples should be provided with relevant information necessary to make an informed decision regarding the proposed treatment and be given the opportunity to ask questions in order to gain a better understanding of the process.

As with any medical procedure, patients must provide informed consent to fertility treatments. Informed consent occurs when a patient understands the nature of the proposed treatment as well as the potential benefits and risks of the treatment and potential alternatives, and voluntarily chooses to proceed with the treatment. Many reproductive endocrinologists, health psychologists and attorneys have expressed their concern for patient understanding of the true risks and consequences of the OI-IUI and IVF processes. The reason relates to the complexity of the reproductive process, which can be difficult for college graduates, even though informed consent is ideally communicated at the sixth grade level. Our goal is to refine our current informed consent process and assess patients'/partners' understanding of the treatment of ART using ARTIST. We plan to supplement the traditional informed consent process with an interactive electronic module consenting process to assess benefit for patient understanding. **Methods:** This study is designed as a Prospective Randomized Clinical Trial in which two parallel studies will be conducted: 1. Ovulation Induction and Intrauterine Insemination (OI-IUI) Treatment and 2. In-Vitro Fertilization (IVF) Treatment. Patients undergoing procreative therapy (OI-IUI and IVF) will be asked to participate in the study. If eligible and interested in participating, patients and their partners will be

consented for research and randomized into two groups, an intervention group and a control group. The control group will be given a standard paper consent to take home. As per standard protocol, they will be asked to read and sign the consent at the time of their teaching session during their second visit, which includes medication teaching. The intervention group will be given the same paper consent and access to an electronic module to be completed on a smart phone, tablet, or computer at home. They will be asked to use the module at home as they read their consent form and sign the consent at the time of their teaching session (second visit). Both test groups will participate in a 15-question assessment of insight from ARTIST upon returning to the clinic for their teaching session treatment. ARTIST answers will be scored and results recorded. Incorrect answers and any other identified areas of confusion will be discussed during the teaching session to further enhance the patients' understanding of the ART process. Feedback from ARTIST and desired teaching method will be ascertained. The results of ARTIST from each group will be compared for significant differences in performance. Power Analysis: Assuming those without the module to get score 9 correctly and those with the module to get 13 correctly, 38 patients in each arm will be required. This should provide us 95% confidence and 90% power. We are planning to enroll 55 patients at this time, which will allow for a 20% drop out rate. **Results:** We are expecting to identify areas of needed improvement in the informed consent process. We plan to analyze our results at both 6 and 12-months. At both of these times, we expect to see consistent improvement in patient scores randomized to our module group at both of these times. Furthermore, we hope to include other clinical sites in our experiment to increase our sample size, applicability, and generalization. While this application is only for a year-long project, we have hopes that we will be able to continue to track patients beginning IVF therapy and track their preferences long-term to determine if completing the module can further help patients to further understand the critical decisions regarding their long-term IVF therapy.

### **Preoperative Incidence of Penile Abnormalities Found in Voluntary Adult Male Medical Circumcision in Swaziland**

Malvika Sharma; Kyra A Dawson DO; Maxfield D Richardson DO; Casey T Walk, Arturo Aranda MD; Jeffrey C Pence MD; David Meagher MD

*Presenting Author:* Malvika Sharma

*Faculty Mentor:* David Meagher MD

*Mentor's Department:* Pediatric Surgery

*Poster Number:* 23

**Research Question/ Objective:** The objective of this report is to make aware the incidence and to increase the clinical suspicion for right sided diaphragmatic hernia in cases of blunt abdominal trauma in the pediatric population. **Background:** Diaphragmatic hernias secondary to blunt trauma are a rare entity in the pediatric population with an incidence ranging from 1-7% overall. Right-sided injuries seem particularly occult, many being found incidentally during operative exploration for other injuries. Diaphragmatic ruptures usually occur in the setting of severe multi-trauma, with 75-90% of patients having other injuries. **Case Presentation:** We present the case of an 11-month year old male who was involved in a motor vehicle collision with a delayed diagnosis of right-sided diaphragmatic rupture. **Discussion:** There are several anatomic differences in children that make this population more susceptible to diaphragmatic hernia. Such as, la suspensory ligaments of the liver, thinner abdominal wall proportion, horizontal nature of diaphragm, and increased compliance of ribs in childhood.

Tears commonly present as posterolateral on the side of the trauma, left being more common. The pressure gradient created by the respiratory cycle is thought to be a major role in this injury. Also, the type of trauma is most commonly blunt in nature, commonly caused by motor vehicle collisions. Right sided injuries are associated with intra-abdominal injuries, while left sided injuries are associated with major vascular or cardiac injuries. These injuries present clinically with dyspnea, abdominal pain or lower thoracic pain. These are likely to change with phase of injury at presentation, latent phase being abdominal contents herniating into thoracic cavity and final phase being visceral ischemia or impaired venous return to the heart. This injury is diagnosed via imaging, the gold

standard being chest CT. Imaging indicates elevated hemidiaphragm, mediastinal shift, hemothorax, and intra-thoracic visceral herniation. Surgery is the definitive treatment for diaphragmatic hernias, since this type of defect will not heal spontaneously. The common procedure is laparotomy. **Clinical Relevance:** If there is clinical concern for potential diaphragmatic injury and/or chest radiography shows equivocal signs of injury, CT imaging of both chest and upper abdomen are warranted to further elucidate possible diaphragmatic injury. After extubation, particularly if there was an initial suspicion of diaphragmatic injury, serial chest x-ray or CT imaging should be obtained, especially if there are lingering respiratory problems.

**Elevated Plasma Marinobufagenin, an Endogenous Cardiotonic Steroid, is Associated with Right Ventricular Dysfunction and Nitrate Stress in Heart Failure**

Brendan Sheehy; Wai Hong Wilson Tang; Kevin Shrestha; Xinmin S. Li; Michael Finucan; Alaa Gabi; Anuradha Guggilam; Charles Medert; Kristen Westfall; Allen Borowski; Olga V. Fedorova; Alexei Y. Bagrov; David Kennedy

*Presenting Author:* Brendan Sheehy

*Faculty Mentor:* David Kennedy

*Mentor's Department:* Cleveland Clinic Center for Cardiovascular disease

*Previous submission:* American College of Cardiology, March 14 2015, San Diego, CA

*Poster Number:* 7

**Research Question/ Objective:** What is the role of cardiotonic steroids in the setting of heart failure and is there a potential role as a biomarker for cardiomyopathy. **Background:** Cardiotonic steroids have an established role in volume expanded states like chronic kidney disease and pre-eclampsia but the role of cardiotonic steroids in the setting of heart failure is less clear. It is important to determine any associations with plasma levels of marinobufagenin(MBG) a cardiotonic steroid in heart failure, and its association with cardiac disease and long term adverse outcomes. **Methods:** In 245 patients with heart failure, plasma MBG levels were measured and these patients then underwent a full clinical, laboratory and echocardiographic work up. All

cause mortality, and HF hospitalization and cardiac transplantation were tracked for 5 years. MBG levels in a mouse model were assessed by following plasma MBG levels following proximal left anterior descending ligation. Effects of MBG infusion into mice via intraperitoneal osmotic pumps were also studied. **Results:** In this study plasma marinobufagenin was associated with elevated NT-ProBNP ( $p=.001$ ), myeloperoxidase ( $P<.0001$ ), dimethylarginine ( $p=.001$ ). Increased plasma MBG was also associated with worse right ventricular dysfunction ( $p<.0001$ ) and associated with increased risk of adverse clinical outcomes ( $MBG> 574, p=.014$ ). We found that ligation of the left anterior descending coronary artery in mice led to elevations in plasma MBG and infusion of MBG in mice also led to increased cardiac fibrosis, myeloperoxidase, and dimethylarginine. **Conclusions:** Elevated plasma MBG levels are associated with worse long term clinical outcomes and right ventricular dysfunction. Infusion of MBG contributes to increased cardiac fibrosis and nitrate stress.

**NT-proBNP but Not Soluble Corin Levels were Associated with Preeclampsia in Pregnancy-Associated Hypertension**

Brendan Sheehy, Meera Kumari, Tracy Kovach, Mario Scarpino, Cynthia Kovach, Anne Coteleur, S. Jules Moodley, Yogesh Shah, Praful V. Maroo, Anjali P. Maroo, W. H. Wilson Tang

*Presenting Author:* Brendan Sheehy

*Faculty Mentor:* W. H. Wilson Tang

*Mentor's Department:* Cleveland Clinic Center for Cardiovascular disease

*Previous submission:* Abstract 14736: NT-proBNP but Not Soluble Corin Levels Were Associated With Preeclampsia in Pregnancy-Associated Hypertension." Circulation Dallas Scientific Sessions. 2013; 128:A14736. Nov 18, 2013

*Poster Number:* 8

**Research Question/ Objective:** We hypothesize that both elevated NTproBNP and soluble corin levels predict the presence of preeclampsia in pregnant patients with hypertension. **Background:** Corin is a serine protease known to convert B-type natriuretic peptide (BNP) prohormone into BNP and its aminoterminal fragment (NTproBNP). In mice lacking corin, high

blood pressure and proteinuria were found at late gestational stages, with associated delayed trophoblast invasion and impaired spiral artery remodeling in the uterus. **Methods:** A total of 149 patients were enrolled for the study. 62(41.6%) patients were diagnosed with preeclampsia while the remaining 87(58.4%) patients were not found to be preeclamptic. In the preeclampsia group, 15(24.2%) patients had chronic hypertension while 47(75.8%) patients had gestational hypertension. In the non preeclamptic group, we had 72(82.7%) patients with chronic hypertension while 15 (17.3%) patients had gestational hypertension. Corin and pro-BNP were measured with immunoassay. **Results:** In this study, we found the level of NTproBNP is significantly higher in the patients with preeclampsia when compared to those patients who did not have preeclampsia, but had hypertension during pregnancy (either chronic hypertension or gestational hypertension). Not surprisingly, the median level of the NTproBNP in preeclamptic patients was much higher than the median NTproBNP level in the non-pregnant population (304.30 [IQR= 96.33 – 570.35]) vs. (60.80 [IQR= 35.61 – 136.80]) pg/ml. We also checked the association of corin with preeclampsia, since corin plays a role in converting prohormone BNP to NTproBNP and so assessment of the blood level of corin may be a useful tool to diagnose preeclampsia. But in our study, soluble Corin levels were not found to be a useful tool to diagnose preeclampsia. **Conclusions:** In patients with pregnancy-associated hypertension, circulating NT-proBNP levels were associated with preeclampsia. Corin may contribute to mechanistic underpinnings of the development of pre-eclampsia in animal models, soluble corin likely has no diagnostic role in human for preeclampsia beyond natriuretic peptide levels.

**SChLAP1 mediated SWI/SNF complex inhibition reveals a therapeutic vulnerability in prostate cancer.**

Udit Singhal; Anirban Sahu, John R. Prensner, Qi Cao, Nithin Edara, Benjamin Chandler, Matthew K. Iyer, Irfan Asangnani, Xuhong Cao, Teng Ma, Arul M. Chinnaiyan

*Presenting Author:* Udit Singhal

*Faculty Mentor:* Arul Chinnaiyan, MD, PhD

*Mentor's Department:* Michigan Center for Translational Pathology

*Previous submission:* Howard Hughes Medical Institute Scientific Meeting of Medical Research Fellows, Chevy Chase, MD in May 2015

*Poster Number:* 11

**Research Question/ Objective:** To characterize the relationship between the long noncoding RNA (lncRNA) SChLAP1 and the SWI/SNF chromatin remodeling complex in prostate cancer.

**Background:** Prostate cancer is the most common cancer diagnosis and the second leading cause of cancer-related death among US men. However, the molecular basis underlying aggressive versus indolent disease remains poorly understood and few genomic biomarkers exist to guide clinical management. Long noncoding RNAs (lncRNAs) are polyadenylated RNA transcripts >200 base pairs in length that have been described as key cellular constituents in numerous biological processes and have emerged as a class of genes that may expand our understanding of clinical diseases, including cancer. Recently, we identified a novel, prognostic lncRNA termed SChLAP1 (Second Chromosome Locus Associated with Prostate-1) that is significantly associated with metastatic and lethal disease. Mechanistically, SChLAP1 interacts with and inhibits genome-wide binding of the tumor-suppressive SWI/SNF complex, though the details of this relationship are unclear. Furthermore, recent studies have shown the potential for therapeutic intervention in instances of SWI/SNF subunit mutations in cancer. Therefore, we sought to better characterize the SChLAP1-SWI/SNF interaction and assess whether this creates a therapeutic vulnerability in prostate cancer.

**Methods:** To identify the regions of SChLAP1 necessary for its function, we created 250 base pair deletion constructs of SChLAP1 and measured RNA-enrichment following SWI/SNF pull-down as well as cell invasion using a Boyden chamber matrigel assay. To investigate whether SChLAP1 preferentially interacts with specific components of the SWI/SNF complex, we performed RNA immunoprecipitation assays using antibodies targeting BRM or BRG1, the mutually exclusive enzymatic subunits of SWI/SNF. SChLAP1 enrichment was measured by qPCR. **Results:** We

identify a 250 base pair region near the 3' end of SChLAP1 that mediates its interaction with SWI/SNF and promotes cell invasion. Additionally, we find that SChLAP1 preferentially interacts with and inhibits BRG1-, not BRM-, containing SWI/SNF complexes. Finally, in the setting of SChLAP1 expression, BRM knockdown significantly decreases cell invasion and proliferation. **Conclusion:** In summary, these studies indicate that SChLAP1-mediated SWI/SNF inhibition may reveal a previously unknown therapeutic opportunity in prostate cancer similar to SWI/SNF subunit mutations.

### **Comparative Biomechanical Analysis of Anchorless Double Row Triceps Tendon Repair Technique**

Robert Siska; Mathew Dorweiler, MD; Greg Gould; Mathew DiPaola, MD.

*Presenting Author:* Robert Siska

*Faculty Mentor:* Mathew DiPaola, MD

*Mentor's Department:* Orthopaedic Surgery

*Poster Number:* 1 **\*\*Digital Presentation\*\***

### **Research Question/ Objective:**

The goal of our study was to compare our novel distal triceps rupture repair technique to the current leading techniques in a cadaver study so as to determine if there is any significant difference in strength and stability. **Background:** Triceps tendon ruptures are a rare Orthopaedic injury that typically occur during a fall on an outstretched arm or when an excessive eccentric load is applied during elbow extension in activities such as weight lifting. Both anabolic steroid use and local steroid injections are reported risk factors for triceps rupture, along with systemic disease associated with pathologic bone metabolism. Patients with a triceps tear will lose extension strength of the elbow, diminishing their ability to perform daily tasks such as simply opening doors. Acute complete distal triceps tendon rupture is very responsive to repair if operated upon within the first three weeks following the injury. Over the past two decades, several studies have addressed evolving surgical repair techniques for complete triceps tendon ruptures. Cadaver studies have favored the biomechanical properties of techniques that have the greatest coverage of the muscle's original dome-shaped bony footprint on the olecranon.

More recently described techniques reattach the tendon to its footprint with suture anchors or by combining suture anchors with bone tunnels into one technique. We have described a novel "double bi-cruciate technique" that uses a new configuration of bone tunnels rather than suture anchors, completely covering the anatomical triceps footprint. With the use of cadavers, this study compares our novel technique to the biomechanical properties of the knotless anatomic repair described in Paci et al. in an attempt to determine if there is any significant difference in biomechanical strength. **Methods:** We obtained 9 fresh frozen cadavers and removed the ulna, radius, and the distal ½ of the humerus with triceps tendon and muscle bellies from each arm, keeping the elbow joint intact. We then randomize each arm to receive either a knotless anatomic footprint repair or a bi-cruciate transosseus repair, using #2 Ethibond for each technique. With the use of electronic linear displacement transducers, we measured the linear displacement of the repairs at the insertion site on the olecranon throughout cycling of each construct from 0-90 degrees 1500 times at 0.25hz, and then afterwards by subjecting them through load-to-failure testing with the elbow locked in a fixed position. **Results:** The preliminary results have trended toward no significant difference in displacement during cyclic loading or load to failure between the two constructs. **Conclusion:** Although the recent trend in the triceps repair literature has been to employ suture anchors rather than to use bone tunnels exclusively, our technique provides an alternative with comparable biomechanical properties that is also cost-effective in that it does not require suture anchors; furthermore, we estimate no practical difference in OR time between our technique and those which involve suture anchors.

### **Chronic Myelogenous Leukemia, Accelerated Phase in a 3 Year Old Girl**

Melanie Stall; Mukund Dole, MD; Ayman El-Sheikh, MB ChB

*Presenting Author:* Melanie Stall

*Faculty Mentor:* Mukund Dole, MD

*Mentor's Department:* Pediatrics

*Poster Number:* 56

**Research Question/ Objective:** We report the presentation and management of a 3 year old female with CML presenting in accelerated phase with a review of literature on pediatric CML.

**Background:** Chronic myelogenous leukemia (CML) is a clonal myeloproliferative disorder characterized by the reciprocal translocation t (9; 22). It accounts for 2-3% of pediatric leukemia with an annual incidence of 0.6-1.2/million cases. CML progresses through 3 phases: chronic, accelerated, and blast crisis based primarily on percentage of blasts in the bone marrow. Initial presentation in accelerated phase or in blast crisis is especially rare in children with only 2 reported cases presenting in accelerated phase under age of 4 years. **Case Presentation:** 3 year old Caucasian female presented with pallor, abdominal distension, decreased appetite, and easy bruising. Examination was significant for pallor, cervical lymphadenopathy, and massive hepatosplenomegaly. Initial studies showed a WBC of 39,000 with 11% blasts, hemoglobin of 8.5 g/dl, and LDH 1195 U/L. Bone marrow studies revealed 17% blasts. Chromosomal studies showed 46, XX with an associated balanced translocation t (9; 22). FISH and PCR showed t (9; 22) (q34; q11.2) consistent with the classical BCR/ABL fusion. Based on bone marrow blast count and confirmation of BCR-ABL, the patient was diagnosed as chronic myeloid leukemia (CML) in accelerated phase. Dasatinib 80mg/m<sup>2</sup> in a single daily dose was initiated following diagnosis. After 8 months of therapy, hepatosplenomegaly has markedly improved and she is in complete hematologic response with no significant drug toxicity. Recent quantitative RT-PCR studies showed 0.43% Bcr-Abl fusion transcripts. She continues therapy with tyrosine kinase inhibitors and received a matched unrelated allogeneic stem cell transplant this week. **Discussion:** Presentation of pediatric CML in accelerated phase in a 3 year old is extremely rare. In those presenting in accelerated phase, the median time to transformation to blast crisis is 6-18 months and the median survival time in blast crisis is 3-9 months. Treatment recommendations are not well defined and continue to evolve with available clinical data. Our experience shows that young children can tolerate and respond to second-generation tyrosine kinase inhibitors such as Dasatinib. Given her current response to therapy and risk of progression

to blast crisis, aggressive therapy with an allogeneic stem cell transplant was warranted.

**Clinical Relevance:** Treatment recommendations for pediatric CML in accelerated phase in young patients are not well defined and continue to evolve. Given that our patient's Bcr-Abl fusion transcripts dropped from 17.53% initially to 0.43% most recently, this report helps define and support treatment recommendations using second generation tyrosine kinase inhibitors.

### **Core Decompression with Synthetic Grafting as a Joint Preservation Strategy in Humeral Avascular Necrosis due to Sickle Cell Anemia – A Case Report**

Andrew Steffensmeier; Karen Kirkham, MD; John Wiemann, MD

*Presenting Author:* Andrew Steffensmeier

*Faculty Mentor:* Karen Kirkham, MD; John Wiemann, MD

*Mentor's Department:* Internal Medicine; Orthopaedic Surgery

*Poster Number:* 31

**Research Question/ Objective:** Avascular necrosis (AVN) of the femoral or humeral heads in patients with sickle cell anemia is a common and painful condition. There is currently no gold-standard treatment protocol for this condition. Typically, the pain is managed with narcotics and activity restriction until there has been collapse of the subchondral bone with a degree of arthrosis sufficient to warrant total joint arthroplasty. This method entails prolonged pain for the patient and decreases ability to function occupationally and recreationally. This report demonstrates a technique of staged decompression of necrotic bone in the bilateral humeral heads with synthetic bone grafting to determine if this could function as a joint preservation strategy. **Background:** Avascular necrosis (AVN) of the femoral and humeral heads is a frequent and debilitating finding in many patients with sickle cell anemia. The standard treatment is observation with symptomatic pain control until the arthrosis has progressed to the point requiring total joint arthroplasty. There is a lack of published research with regard to joint preservation strategies in this patient population. **Case Presentation:** This case illustrates a patient with bilateral humeral head avascular necrosis in

which staged decompression of the necrotic bone with synthetic bone grafting was performed as a joint preservation strategy. It is our goal to delay end-stage arthrosis and cartilaginous degeneration with early intervention using this synthetic bone grafting (PRO-DENSE). **Discussion:** We show a potential method to mitigate the arthrosis and prevent or delay the need for total joint arthroplasty with early intervention in sickle-cell anemia patients with AVN. Synthetic grafting with an injectable calcium sulfate and calcium phosphate composition (PRO-DENSE) has been shown to be effective in allowing relatively rapid bone regrowth in the setting of other cavitory bone defects such as after tumor resection or hip AVN. While decompression and grafting will not change the underlying sickle cell disease process, it is our hope to provide improved quality of life for these patients. Further study is required to demonstrate the long-term efficacy of joint preservation strategies in the humeral heads of sickle cell patients with humeral head AVN. **Clinical Relevance:** There are few published articles on shoulder joint preservation in sickle cell anemia presenting with AVN. In this report, we show a potential method to mitigate this process and prevent or delay the need for total joint arthroplasty with early intervention. Having a significant population of patients with sickle-cell anemia, this report may give insight into methods to help deter or, at least delay, the joint pain and surgical joint replacement in AVN sickle-cell patients.

#### **A Novel GATA3 Mutation in a Patient with Hypoparathyroidism, Deafness, and Renal Dysplasia (HDR Syndrome)**

Kaitlyn Steffensmeier; Susan Pena-Almazan, MD; Paul Breyer, MD; Leonardo Canessa, MD

*Presenting Author:* Kaitlyn Steffensmeier

*Faculty Mentor:* Susan Pena-Almazan, MD

*Mentor's Department:* Pediatrics

*Poster Number:* 54

**Research Question/ Objective:** The present case reports on a 15 year old female presenting with HDR syndrome, who has hypoparathyroidism, bilateral sensorineural deafness, and nephrocalcinosis with chronic renal insufficiency. She was found to have a novel heterozygous mutation in the GATA3 gene designated as

c.801T>G which has not been previously reported in the literature as a mutation in the GATA3 gene causing HDR syndrome. **Background:** HDR syndrome consists of the triad of hypoparathyroidism, deafness, and renal disease. The syndrome was first reported in 1977 by Barakat et al. in a case of two brothers who presented with hypoparathyroidism, steroid-resistant nephrosis with progressive renal failure, and sensorineural deafness. Since this first report, there has been more patients described in the medical literature to have this syndrome. Previous studies have found HDR syndrome to be caused by a haploinsufficiency of the GATA-3 gene located on Chromosome 10p15. This haploinsufficiency results from a heterozygous mutation in the GATA-3 gene which inactivates the gene. The GATA-3 gene encodes the GATA-3 transcription factor, which belongs to a family of zinc finger transcription factors that are involved in vertebrate embryonic development. Specifically, the GATA-3 transcription factor is involved in the embryonic development of the parathyroid glands, kidneys, inner ears, thymus and central nervous system. **Case Presentation:** The patient in the present case, initially presented as a neonate with hypocalcemic seizures secondary to hypoparathyroidism. There was difficulty in achieving normocalcemia in the first few months of life attributed to maternal neglect in early childhood necessitating multiple admissions for hypocalcemic seizures. She had no hearing test done earlier than 2 years old, thus, it was not determined that she had hearing impairment until 2 years of age. She was diagnosed with moderate to severe bilateral sensorineural hearing loss and needed hearing aids by 4 years of age. Early nephrocalcinosis was diagnosed at 4 months old and she had chronic renal insufficiency by 13 months of age. The presence of nephrocalcinosis may be related to her treatment as well as part of her underlying HDR syndrome. Unique features found in our patient which had not been reported in other cases of HDR syndrome, were the presence of idiopathic short stature and developmental delay. At 14 6/12 years of age, genetic mutation analysis found her to be heterozygous for c.801T>G(p.Cys267Trp) in the GATA-3 gene. **Discussion:** HDR syndrome (hypoparathyroidism, sensorineural deafness and renal dysplasia) was initially described as a rare condition inherited as an autosomal dominant trait

related to terminal deletion of chromosome 10p. Subsequent studies had established its cause to be due to mutation in the GATA3 gene located on chromosome 10p. The patient in the present case presents with hypoparathyroidism, bilateral sensorineural deafness, and nephrocalcinosis with chronic renal insufficiency, thus exhibiting all three features of HDR syndrome. The patient in our case has a novel heterozygous mutation in the GATA3 gene designated as c.801T>G which was predicted to lead to amino acid substitution p.Cys267Trp. This mutation has not been previously reported in the literature or found in general populations. The amino acid substitution is predicted by two amino acid substitution programs to be “probably damaging” and “deleterious”, respectively. Mutation study was not done on any other member of our patient’s family. Since no other family member manifested any disorder in calcium metabolism, renal function, or deafness, our patient most likely had a sporadic mutation. It is likely that this mutation can explain the presence of abnormalities in our patient in the parathyroid gland, inner ear and in the kidneys. **Clinical Relevance:** Through the knowledge of HDR syndrome and the triad of symptoms associated with it, clinicians will be alerted to the possible coexistence of renal disorder, or hearing loss in a patient who has hypoparathyroidism. Also, investigating the GATA3 gene mutation in a family member can help detect the presence of HDR syndrome in other family members even prior to onset of disease and prevent serious morbidities resulting from hypocalcemia, deafness, and renal disease.

### **The Effect of the Affordable Care Act on Healthcare Access for Lower Income Families in Dayton, OH**

Elise Striebich

*Presenting Author:* Elise Striebich

*Faculty Mentor:* Mary T. White, PhD

*Mentor’s Department:* Community Health

*Poster Number:* 20

**Research Question/ Objective:** Has the Affordable Care Act improved access to healthcare among Dayton, Ohio’s lower income residents and is the healthcare received by that population perceived as beneficial? **Background:** The

Affordable Care Act was signed into law on March 23, 2010 and its impact has slowly rippled across the nation. This study explores this impact on residents of Dayton, OH, particularly those who formerly lacked access to healthcare. The goal of this study is to evaluate their insurance status, their current access to healthcare and whether or not healthcare is perceived as beneficial. The hypothesis is that the Affordable Care Act has increased access to health insurance for lower income residents of Dayton, but that there are many residents who are still not receiving the healthcare that they need. **Methods:** An anonymous survey and informed consent document were designed with specific questions about types of health insurance, respondents’ understanding of their health insurance, medical conditions faced by the individuals, the treatment they are receiving for those conditions and their satisfaction with the health care they are receiving. 100 residents of northwest Dayton were selected based on their participation in a need-based program called Compassion 1st, through Christian Life Center of Dayton. This program provides food and supplies to families with a demonstrable need. The survey was distributed over 2 consecutive months. **Results:** A total of 78 responses were received. 14% had employer provided health insurance plans, 24% were covered by Medicare, 37% by Medicaid, 9% by both Medicare and Medicaid and 15% were uninsured. Primary barriers to health insurance among the 15% who were uninsured were cost, perceived lack of eligibility for plans and confusion about the plans and how to obtain them. Of those who were insured, 80% felt they adequately understood their plan and its coverage. 65% of the total survey respondents reported seeing a family or nurse practitioner in the past year; 54% of respondents reported urgent care or emergency department utilization. 10% of respondents reported no utilization of health care services in the last year. Of the total population surveyed, 74% reported diagnosis of at least one chronic medical condition, 67% of those reported receiving treatment for their condition and 91% reported adherence to their treatment. Reported reasons for not adhering to treatment were time involved, adverse effects of the medications, forgetting to do treatment, and the treatment is unpleasant. 76% of respondents reported continuity of care with their physician and 72% felt the healthcare received was



adequate or excellent. **Discussion:** The study results show that there are still barriers to receiving health insurance; however, they do not adequately confirm the hypothesis that the ACA has increased access to health insurance in northwest Dayton. Approximately one third of the population surveyed was already covered under Medicare to some extent. The survey did not assess when those covered by Medicaid began their Medicaid coverage, therefore, we cannot determine if they became covered under the Medicaid expansion portion of the ACA. In those who were uninsured or under-insured and aware of what the ACA provides, cost of the marketplace plans was the most commonly cited barrier to obtaining them. Many respondents also cited confusion about how to obtain and navigate the marketplace plans. The majority of respondents who were insured endorsed understanding of the benefits available to them with their current health insurance plan.

The majority of respondents cited their health care to be adequate or excellent. Almost all patients with chronic conditions reported receiving treatment for their condition and 91% claimed adherence to their treatment regimen. A large majority of respondents also reported seeing a family practitioner and adequate continuity of care with their physician. However, there are still many who are utilizing emergency department and urgent care services, which highlights the continued need for public education on when those services should be utilized. **Conclusion:** The results of this study suggest that the majority of this population has adequate access to health care and is satisfied with the quality of that care. Because it did not address when Medicaid took effect for respondents, it cannot confirm that the ACA has increased healthcare access for this population. However, this study highlights that there are still multiple barriers to obtaining health insurance for the uninsured and the needs for patient education on how to best utilize primary care and emergency services.

### **Prevention of Proximal Junctional Kyphosis/Failure Using Sublaminar Bands in a Hybrid Construct in Pediatric Kyphosis Deformity**

John Sullenbarger; Michael Albert, MD; Chris Wild, MD

*Presenting Author:* John Sullenbarger  
*Faculty Mentor:* Michael Albert, MD  
*Mentor's Department:* Orthopaedic Surgery  
*Poster Number:* 38

### **Research Question/ Objective:**

The purpose of our study was to determine the efficacy of polyester sublaminar bands in preventing proximal junctional kyphosis in patients with kyphotic deformities undergoing posterior spinal fusion. **Background:** Proximal junctional kyphosis (PJK) and proximal junctional failure (PJF) are common complications after posterior spinal fusion for kyphotic deformity correction. Research has suggested multiple potential etiologies for this complication, including the rigidity of the surgical construct and the disruption of posterior ligamentous attachments during surgical dissection. The purpose of this study was to evaluate midterm PJK/PJF rates and clinical outcomes, in patients that underwent posterior spinal fusion and deformity correction using sublaminar bands in a hybrid construct.

**Methods:** This is a retrospective review of pediatric spinal deformity cases performed by a single surgeon from January 2008 to December 2012. Inclusion criteria for this study includes patients with a kyphosis greater than 60° treated surgically utilizing sublaminar polyester bands in a hybrid construct at the proximal end of the deformity with minimum of 2 years of follow up. 136 spinal deformity cases were reviewed from this time period and 17 cases met inclusion criteria. PJK was defined as proximal junction sagittal Cobb angle (PJA) of at least 10° greater than the preoperative measurement. This was assessed by comparison of preoperative xrays and in- hospital postoperative xrays to xrays obtained at least 2 years later during outpatient followup. Our hypothesis was that posterior spinal fusion performed with our technique would have a lower rate of PJK than previously reported with other methods of fixation. **Results:** The range of the preoperative kyphosis was 62°-111°, and postoperative kyphosis was 12°-55°. There was one case of PJK (5.8%) and no cases of PJF. **Conclusion:** This study on midterm outcomes of PSF using sublaminar bands for treatment of kyphosis demonstrated a lower rate of PJK than has been reported in prior studies. This technique decreases the rigidity of the construct resulting in a

smoother transition between fused and unfused segments.

### **Are Standardized Patient Exams with Melanoma Moulages a More Accurate Reflection of Medical Student Concept Mastery than Standard Multiple-choice Exams?**

Maggie Sullivan; Jaclyn Scholtz

*Presenting Author:* Maggie Sullivan

*Faculty Mentor* Smita Krishnamurthy, MD

*Mentor's Department:* Pathology

*Previous submission:* American Academy of Dermatology, Washington DC, May 5, 2016

*Poster Number:* 19

**Research Question/ Objective:** Detecting melanoma is a fundamental skill that all graduating medical students should have since early detection is crucial for improving patient survival. Studies using melanoma prosthetics/moulages have shown that the ability of medical students to detect melanoma is low. The goal of our project is to determine how well the current Musculoskeletal and Integument (MSI) course at the Boonshoft School of Medicine prepares second year medical students to detect melanoma in their future patients. The detection rates of students in standardized patients will be compared with their multiple-choice final exam scores to assess whether testing with moulages is a more authentic measure of student knowledge than multiple-choice questions. **Background:** Invasive melanoma is the fifth most common type of cancer in men and the seventh most common type of cancer in women. The five-year survival rates for melanoma varies depending on when detected. For example, the survival rates of a few situations are described as follows: If detected and treated before it spreads to the lymph nodes is 98%, with regional spread is 63%, and with distant spread is only 16%. Studies have shown that medical students have low detection rates of melanoma, and may be the population to target to increase detection rates in a primary care setting. In a study by Hernandez et al, only 22.6% of fourth year medical students detected melanoma in standardized patients using a melanoma moulage. Skin moulages can be used as part of standardized patient examinations for building diagnostic skills. Second year medical students at BSOM learned about the clinical

detection, pathologic diagnosis, and treatment of melanoma via lectures and team-based learning activities in the MSI course in the 2014-15 academic year, and were required to obtain a passing score of 70% on the multiple-choice final exam. This study was designed to assess the ability of students to appropriately diagnose melanoma in a standardized patient using a melanoma moulage five months after the course. **Methods:** This study was performed during a mandatory simulated patient encounter (SPE) for second year medical students five months after the musculoskeletal and integument course. A total of 5 standardized patients were used during a routine SPE session for dyspnea, and they each had an identical 8 mm synthetic melanoma moulage placed on the upper back. The moulage was created from silicone based on an image of a superficial spreading melanoma encountered in clinic. Students were divided into 3 groups over 3 weeks for ease of assessment. We assessed the student's ability to recognize, describe, inquire about, and decide how to manage this lesion based on their answers to an ungraded 5-question survey following the patient encounter. Their performance was compared with their overall and melanoma-specific final exam scores on the 100 question musculoskeletal and integument multiple-choice final exam. **Results:** No significant difference was noted in the melanoma detection rates in the 97 medical students based on the week of examination ( $p=0.25$ ). 63 of the 97 students (65%) noticed the melanoma on the back following their SPE. Of these, only 9 described the lesion accurately based on ABCD criteria. Only 3 students collected additional history about sun-exposure, 9 students asked about the duration and change of the lesion, and none of them asked or counseled the patient about sunscreen use. 54 out of the 63 students (85%) considered melanoma in their differential diagnosis and mentioned performing a biopsy or excision as the next best step in patient management. The mean final exam score for the class was 85.2%. No statistically significant correlation was noted between student melanoma detection rates on the SPE and performance on the MSI multiple-choice final exam ( $r_s$  (correlation coefficient)=0.023), or melanoma-specific exam questions ( $r_s=0.14$ ). **Conclusion:** In this study, the ability of second year medical students to appropriately detect, describe, and manage melanoma in a standardized patient with a moulage

did not correlate with their performance on melanoma-specific questions on a multiple-choice exam. Using a melanoma moulage during standardized patient examination can be a simple, effective and authentic way to assess medical student knowledge in a real-world setting.

### **STEPS Storyboard**

Paige Sutton; Rachael Libertain; Stephanie Welsh; Juanita Draime

*Presenting Author:* Paige Sutton

*Faculty Mentor:* Paul J. Hershberger, PhD

*Mentor's Department:* Family Medicine

*Poster Number:* 62

**Research Question/ Objective:** Build a sustainable, multidisciplinary student team to motivate underserved populations toward positive health improvements. **Background:** STEPS is a collaborative health initiative led by an interdisciplinary team of medical, pharmacy, psychology, and nursing students. STEPS provides preventive health counseling to residents at three Dayton area homeless shelters who often struggle with chronic disease, mental health issues, food and shelter insecurity, and adequate support systems. These factors negatively impact their health and well-being. Thus, STEPS seeks to address these problems by providing inter-professional, preventive health services and connecting participants with resources to further advance their health goals. STEPS offers a unique answer to the question of healthcare access for the underserved—first by bringing together students from multiple professions to collaborate and meet the needs of the Dayton area homeless population. In order to best serve patients, healthcare professionals must collaborate, and this allows early interaction among different professions. Secondly, STEPS focuses on preventive healthcare for vulnerable populations. The residents at homeless facilities often are reactionary to their health, given lack of access to care and other more pressing needs, such as shelter, food, and clothing. All students and faculty who work with STEPS have been trained in motivational interviewing and use these skills as a team to actively listen to needs, desires and fears and enable participants to feel that they have control over their health. STEPS began with 7 students serving one shelter in 2012 and today has over 178 volunteers.

Our experience applies to those interested in building successful interdisciplinary teams and learning about the health needs of the local homeless population. **Methods:** To improve sustainability: 1. Applied for grants 2. Created a sustainable organizational structure 3. Increased volunteer base through integration into school curriculums. To improve social impact: 1. Expanded to additional homeless shelter locations 2. Increased services at current locations. To improve professional development: 1. Increased multidisciplinary involvement 2. Improved clinical skills. **Results:** For sustainability: STEPS applied for a Social Entrepreneurship Grant offered through WSU Office of Multicultural Affairs. They were awarded \$2,400. First and second year medical students are able to receive Service Learning credit through a Student-Led elective while third year pharmacy students are able to receive Introductory Pharmacy Practice Experience credit, helping lead to the growth of volunteer base. The group implemented the executive board in spring of 2014 which consists of six sub-committees that each have particular responsibilities. For social impact: STEPS started with monthly sessions at the men's homeless shelter in the fall of 2012. Bimonthly sessions were started in February of 2014. In fall of 2014, sessions were expanded to the local women's shelter. In fall of 2015, STEPS expanded to a youth center. With the increase of student volunteers, the amount of participants served has increased dramatically. STEPS was recognized as the United Way's Volunteers of the Month in May 2013. For professional development: The executive board began with 7 medical students and has increased to 20 students representing four different healthcare professions. 87% of volunteers attend more than one session. All volunteers that attended a training session reported feeling more confident in their interviewing skills post training. Surveyed volunteers also had a significant increase in confidence in taking blood pressure or a blood glucose. 62% of students reported that working on an interdisciplinary team played a great role in why they participate in STEPS. **Conclusion:** STEPS has grown as a multidisciplinary team to include medicine, nursing, pharmacy and psychology. The initiative capitalizes on the principle that in order to overcome issues related to contextual variables, all specialties need to work together to ensure

continuity of care. In order to create social change, we must start with the students in these multiple disciplines. By creating a sustainable multidisciplinary group, STEPS has enabled students to grow as professionals, and learn the invaluable lesson that each patient must be viewed in the context of their community and accessibility to social resources. STEPS strives to assimilate all aspects of health care as each plays a pivotal role in quality of services provided. Bottom line: STEPS has found success in improving sustainability, social impact, and professional development, and believes the value added through the initiative will not only impact current participants and students but also the future of healthcare delivery.

### **The Role of Tranexamic Acid in Chondrocyte Viability**

Matthew Dorweiler, MD; David Swanson, MS, Sunishka Wimalawansa, MD

*Presenting Author:* David Swanson

*Faculty Mentor:* Sunishka Wimalawansa, MD, MBA

*Mentor's Department:* Plastic Surgery

*Poster Number:* 44

**Research Question/ Objective:** What is the effect of tranexamic acid on chondrocyte viability?

**Background:** The use of tranexamic acid (TEA) in plastic and orthopaedic surgery is increasing in both spectrum and popularity. Classically, it is used in procedures accompanied by extensive perioperative bleeding, as it has been shown to dramatically reduce the need for blood transfusion and subsequent morbidity and mortality. More recent applications of TEA involve its protective and potentially regenerative influence on native chondrocytes. While studies with practical clinical applications are few and far between, laboratory studies show promise for future clinical relevance in the management of degenerative joint disease and other musculoskeletal pathology. This study aimed to clarify the effects of TEA on chondrocyte viability for such clinical applications. **Methods:** Two groups of chondrocytes were isolated into stabilized cell constructs. The first group of cells was exposed to TEA in a logarithmic dosing pattern. The control group was not exposed to TEA. Using a highly specialized automated cell

counter, chondrocyte viability and cell count was measured at various time points following exposure to TEA versus controls. **Results:** While long-term data from subsequent time points are still being collected, preliminary results demonstrate increased viability and quantity of cells exposed to TEA compared to controls. **Conclusion:** Our current data suggests a positive correlation between tranexamic acid exposure and chondrocyte cell count and viability. While further results are still being collected, preliminary data is promising for the application of tranexamic acid in future clinical applications of cartilage regeneration in degenerative joint disease and other musculoskeletal pathology. Such applications will be the next arm of this study.

### **Quality Improvement Project on Data Collection Methods on Graduating Medical Students**

Eric Thuney; John Donnelly, MD; Jayna Vossler

*Presenting Author:* Eric Thuney

*Faculty Mentor:* John Donnelly, MD

*Mentor's Department:* Family Medicine

*Poster Number:* 46

**Research Question/ Objective:** 1. To determine how medical schools are following their medical students post-graduation. 2. To understand the benefits and drawbacks of following and collecting information on medical students post-graduation.

**Background:** Following medical students post-graduation seems to be an overlooked endeavor of many medical schools in the United States. At Wright State University (WSU) Boonshoft School of Medicine (BSOM), the Department of Family Medicine is evaluating the effectiveness and promoting the importance of following BSOM graduates. Efforts to follow medical students and collect data on where medical students are practicing will be a valuable tool to support grant funding, along with meeting accreditation standards. The Liaison Committee on Medical Education (LCME) requires that programs demonstrate their graduates exhibit general professional competencies that are appropriate for entry to the next stage of their training. The LCME also has a special interest in medical students working in rural communities and assessing workforce needs. Collecting data on medical

students after graduation allows medical schools to demonstrate that these areas are being met and promotes good standing against other medical schools. Following up with graduates presents with a unique challenge with the natural progression of the medical profession leading to relocations for residencies followed by fellowships and different opportunities that arise throughout one's professional career. These may take graduates from place to place as they advance their careers, which leads to numerous address changes, name changes, and non-compliance from the graduate or the graduate-affiliated institution. No government requirements currently exist for collecting data on graduates, which leads to barriers of costs, resources, and lack of support for taking on an initiative of tracking medical students post-graduation. There is no funding specific for the cause either. These lend to barriers of cost, resources, and lack of staff for the necessary task of student graduate tracking. Before WSUBSOM takes on this large initiative, it is imperative to understand how other medical schools are following their graduates. **Methods:** A total of 31 medical schools throughout the country were contacted via email and/or phone using their alumni relations point of contact as seen on the medical schools' websites. A total of ten schools reply with various amounts of information submitted. Questions asked included: 1. How do you contact the students? 2. How often do you contact the students? 3. What data do you collect? 4. Who lead/organizes these efforts? 5. How much effort does it take? 6. How do you keep track of the data? 7. Have you used this data when applying for grant funding? 8. What is your response rate? **Results:** A total of ten schools reply out of 31 schools contacted (32% response rate) with various amounts of information submitted. A variety of methods have been attempted by different medical programs throughout the country. A large portion of the data tracking involves the participation by the graduates. Many institutions that currently track graduates do so for a variety of reasons but none that replied to the survey, did so for grant purposes. Most did so for general follow-up of their graduates, solicitation purposes, ability to keep in contact for reunion purposes, as well as a number of other reasons. **Conclusion:** Tracking graduates is a large undertaking. Every school contacted relied on graduates voluntarily submitting

information. Some schools also had a person who manually searched online records for updates on graduates. Emails, magazines, letters, and online links from the school of medicines' respective alumni section were commonly used to obtain graduates' location and information. Some schools had low response rates due to lack of resources and people involved in tracking. The schools with better responses seemed to utilize a dedicated person or department to track their graduates using responses from different sources. The schools with the highest response rates also had somebody who was able to search the internet for contact information and follow up with the different graduates for those who hadn't responded to other means of communication.

There are numerous benefits and drawbacks to these undertakings. Each school had its own agenda for following graduates. Some schools only wanted to follow students for updates and for solicitation purposes for future donations. Others wanted to track the progress of their students and use them as resources for the current medical students. A portion of accreditation includes meeting certain criteria for graduates in rural and underserved areas and the tracking of students may help demonstrate that schools are addressing these issues. Drawbacks were found in this quality improvement project. A low response rate by the schools contacted is a concern for an incomplete picture of how schools across the country are addressing tracking graduates. A possible follow-up email or reaching out to other schools may yield efforts that are very effective that have not been discussed by other schools. Time and effort were also considerable drawbacks as very few programs seemed to have a dedicated person for following up on graduates who had not been responding. This led to low response rates and an incomplete picture of where the graduates were located with their practices.

### **Use of Obstetric Vacuum Extractor in Removal of Rectal Foreign Body in a Pediatric Patient**

Casey Walk; Malvika Sharma; Jeffrey Pence MD

*Presenting Author:* Casey Walk

*Faculty Mentor:* Jeffrey Pence, MD

*Mentor's Department:* Pediatrics

*Poster Number:* 22

**Research Question/ Objective:** The objective of this report is to determine if an Obstetric Vacuum Extractor can safely and effectively remove spherical rectal foreign bodies in a pediatric patient.

**Background:** Rectal foreign bodies vary in shape, size, and patient population. Removal of different shaped rectal foreign bodies requires different treatment methods, including the obstetric vacuum extractor. This device has never been reported in the removal of a foreign body in a pediatric patient.

**Case Presentation:** We present a 15 year old male with a spherical shaped rectal foreign body that was removed via obstetric vacuum extractor without complications.

**Discussion:** The use of an obstetric vacuum, in this case, was found to be safe and effective for use in the pediatric population; its use results in less soft-tissue trauma and anal sphincter injury. In this case, the use of the obstetrics vacuum aided in the safe removal of a baseball from the rectal cavity of a pediatric patient.

**Clinical Relevance:** The obstetric vacuum extractor should be considered as a safe, efficient technique for spherical foreign body extractions in the pediatric population.

### **A Rare Case of Acute Pseudo-Meigs' Syndrome Presenting with Pleural Effusion and Ascites And A Ruptured Leiomyoma and Hemorrhagic Shock**

Stephanie Welsh; Matthew Cowan, DO, Janine Crantz, DO, William Nahhas, MD, Steven R. Lindheim, MD

*Presenting Author:* Stephanie Welsh

*Faculty Mentor:* Steven Lindheim MD,

*Mentor's Department:* Obstetrics and Gynecology

*Previous submission:* Dayton Area Graduate Medical Education Community, Dayton OH, 2015

*Poster Number:* 10

**Research Question/ Objective:** Objective: To present a case of uterine leiomyoma presenting with two serious and rare complications, in order to aid clinicians in recognizing this uncommon syndrome.

**Background:** Background: Meigs' Syndrome is classically described as a triad of benign solid ovarian tumor with the gross appearance of a fibroma, accompanied with ascites and pleural effusion. In contrast, pseudo-Meigs' Syndrome presents with ascites and pleural effusion but with any other pelvic mass, including mature teratomas,

struma ovarii, and leiomyomata of the ovary, fallopian tube, or uterus. While leiomyomata are the most common benign tumors of the uterus, they are rarely implicated in pseudo-Meigs' Syndrome or intraperitoneal hemorrhage.

**Case Presentation:** A G1P0010 presented after acute onset of sharp abdominal pain followed by a pre-syncopal episode. An abdominal computed tomography scan was performed to investigate for possible ruptured aortic aneurysm; imaging revealed a large heterogeneous pelvic mass associated with the uterus and surrounding intraperitoneal hematoma. Additionally, there was a large right-sided pleural effusion without any radiographic signs of chest trauma. An exploratory laparotomy revealed a complex of leiomyomata and an actively bleeding cystic fibroid. A hysterectomy with bilateral salpingoophorectomy was performed and the patient's post-operative recovery was uneventful with complete resolution of her symptoms.

**Discussion:** The pathophysiology of the ascites and pleural effusions is not completely understood, and may be multi-modal. Conventionally identified modes of fluid accumulation include lymphatic obstruction by the mass itself or by metastatic tumor cells, and transudative fluid loss caused by interstitial edema in the tumor. The pleural effusion is thought to accumulate by transdiaphragmatic transudate. Serosanguinous and hemorrhagic effusions have been reported both with benign and malignant pathology are thought to be related to pleural inflammation. Recent molecular work has identified a pattern in Meigs' Syndrome of elevated levels of vascular endothelial growth factor, fibroblast growth factor, and interleukin 6. These can cause increased vascular permeability and capillary leakage and is likely related to the pathophysiology of both the ascites and pleural effusions. Many cases of leiomyoma rupture or hemorrhage involve the spontaneous rupture of superficial thin-walled veins; other cases are trauma-related; still others are related to fibroid degeneration.

**Clinical Relevance:** Both leiomyoma rupture and hemorrhage are more frequently found with malignant pelvic neoplasms. This case study may be used as a reminder that benign conditions may still cause significant sequelae if not adequately addressed.

### **An Electronic Medical Record Online Portal at a Federally Qualified Health Center: Patient Use, Perceptions, and Barriers**

Austin Williams; B. Adam Bolyard, DO; Mamle Anim, MD; Thomas Koroscil, MD

*Presenting Author:* Austin Williams

*Faculty Mentor:* Mamle Anim, MD

*Mentor's Department:* Internal Medicine

*Poster Number:* 47

**Research Question/ Objective:** This pilot study, therefore, seeks to evaluate patient use and perceptions of online portals, identify potential barriers to use, and uncover areas of future study regarding the efficacy of online patient portals.

**Background:** Introduction: With the widespread adoption of electronic medical records (EMRs), multiple features have been created to ensure meaningful use of these systems. Online portals allow patients to access test results, view their health history, and contact their medical provider. While the efficacy and use of these portals have been evaluated in general as well as in several disease-specific populations, there is a paucity of data regarding portal use in low-income populations. A disparity in access to care for low-income populations has been well documented. It is reasonable that there is also a disparity in portal access. **Methods:** Methods: All patients seen at an urban Federally Qualified Health Center (FQHC) resident clinic between November 2015 to January 2016 were given the opportunity to complete a short survey regarding their use of the clinic's online patient portal. The clinic's nurses were briefed and provided the survey during each office visit intake procedure. The patients were given a packet including a cover letter explaining the study, consent, and their anonymity in the study as well as the survey. Patients that elected to participate filled out the surveys and returned them to the clinic staff. Data were compiled by the researchers through the use of an online survey platform. Resulting data were analyzed using the descriptive statistic functions of the IBM SPSS software. **Results:** Results: Of the total clinic population of 3138 (most recent data available, 2014), 205 patients completed the survey. We found that the majority of respondents (75.8%, CI: 5.93) had not signed up for the clinic's online portal. Of those respondents that had created a portal account, the majority (n =

26, 59%) had used it more than five times, though this did not reach statistical significance due to limited number that have accessed the portal. The most common uses for the portal were looking up lab results (17%, CI: 5.04), viewing health history (14.5, CI: 4.72), and scheduling an appointment (13%, CI: 4.51). The most common barriers to use were inability to afford internet services (36.1%, CI: 7.58), lack of knowledge of the use of technology equipment and programs (28.6%, CI: 7.13), and not wanting to use computers (18.4%, CI: 6.11). There was no significant difference in age group or gender use of the patient portal.

**Conclusion:** Discussion: This study extends the existing data by evaluating online portal use in a previously unstudied population. The initial data found that patient usage of the clinic's online portal is low. Several barriers were found which may explain this low rate of use, primarily cost and technological literacy. Future study would be beneficial to further evaluate usage by subgroups (age, gender, race, education level, etc.) to make data more generalizable. Comparison to the wider patient population may also be beneficial. This may help guide clinic and healthcare policies which improve access to health-related information in low-income populations.

### **Characteristics of Esophageal Carcinoma in a Veteran Population**

Theresa Ratajczak, MD; Sara Yacyshyn; Heidar Albandar, MD; Parker Redlien, MD; Ronald Markert, PhD; Geetika Kumar, MD

*Presenting Author:* Sara Yacyshyn

*Faculty Mentor:* Geetika Kumar, MD

*Mentor's Department:* Internal Medicine

*Poster Number:* 21

**Research Question/ Objective:** To evaluate environmental and genetic risk factors for developing esophageal carcinoma in a veteran population in order to identify modifiable risk factors for its prevention. **Background:** In 2016, the American Cancer Society estimates that there will be about 16,910 new esophageal carcinoma cases diagnosed (13,460 in men and 3,450 in women) and there will be approximately 15,690 deaths from esophageal carcinoma (12,720 in men and 2,970 in women) in the U.S. Esophageal carcinoma cases are projected to increase by

approximately 35% through 2025 in the U.S., prompting an increased need to identify potentially modifiable risk factors. **Methods:** Records of patients diagnosed with esophageal carcinoma between 1996-2014 were reviewed. Patients without biopsy proven carcinoma and incomplete documentation were excluded. Information on demographics, family history, social and environmental factors, hereditary associations, location, length, grade, and stage of tumor, treatment, and survival was collected. Statistical analysis was performed using IBM SPSS Statistics 22.0 and proper data-dependent statistical testing. **Results:** Of the 118 eligible patients, 81 were classified as having adenocarcinoma (EAC) and 37 as having squamous cell carcinoma (SCC). Age at diagnosis for EAC and SCC was  $67.1 \pm 9.7$  vs.  $67.0 \pm 10.8$  years, ( $p=0.83$ ). Compared to SCC, patients with EAC were more likely to be white than African American (98.8% vs. 59.5%,  $p < 0.001$ ). Veterans with EAC were more likely to have a  $\geq 60$ -pack year history of smoking than with SCC (46% vs. 24% ( $p=0.027$ )). The SCC group was more likely to be heavy alcohol users (69% vs. 56%,  $p=0.23$ ). The two groups did not differ regarding a family history of malignancy of any kind (62.2% SCC vs. 65.4% EAC,  $p=0.73$ ) or of solid tumors (35.1% SCC vs. 35.8% EAC,  $p=0.94$ ), GI cancer (13.5% SCC vs. 18.5% EAC,  $p=0.50$ ) or head and neck cancer (24.3% SCC vs. 22.2% EAC,  $p=0.80$ ). SCC was distributed nearly

equally in the upper (33.3%), middle (36.1%) and lower third (30.6%) of the esophagus while EAC almost always occurred in the lower third (93.7%) [ $p < 0.001$ ]. Approximately three-fourths of tumor grades were moderately or poorly differentiated (79.5% SCC vs. 71.6%). The mean length of tumors was  $62.9 \pm 37.0$  mm. Stage II was the most frequent classification (42.4% for SCC vs. 48.1% for EAC). Only 6.1% of SCC and 2.5% of EAC were stage 0 or I. The combination of chemotherapy and radiation was the most common therapy (46.1%). SCC and EAC patients did not differ in months of survival (SCC median = 7.0, interquartile range [IQR] = 13.5 vs. EAC median = 8.6, IQR = 11.9,  $p = 0.72$ ). **Conclusion:** EAC patients were more likely to be African American, have a longer smoking history, and have their tumor located in the lower third of the esophagus. Patients with the two types of cancer did not differ on age, alcohol use, and family history of malignancy and were similar in regard to grade, length, and stage of tumor, treatment, and survival. While EAC and SCC did not differ in diagnostic findings in our study, the changing epidemiology of esophageal carcinoma (EAC increasing and SCC decreasing), suggests that the relationships between the two types of cancer should be reassessed periodically to improve prognosis among veterans.





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*Presenting Author:* Robert Siska  
*Faculty Mentor:* Mathew DiPaola, MD  
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*Presenting Author:* Maryam Shahin  
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Ali Bukhari, MD; Keegan Bakos; Eric Erb  
*Presenting Author:* Keegan Bakos; Eric Erb  
*Faculty Mentor:* Ali Bukhari M.D.  
*Mentor's Department:* Internal Medicine
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*Presenting Author:* Shankar Narayanan  
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*Mentor's Department:* Orthopaedic Surgery
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Kevin Kawalec, Jeffrey Guina, MD, Capt, USAF, MC; Ramzi Nahhas, PhD; Seth Farnsworth, MD, Capt, USAF, MC  
*Presenting Author:* Kevin Kawalec  
*Faculty Mentor:* Jeffrey Guina, MD, Capt, USAF, MC  
*Mentor's Department:* Psychiatry

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Brendan Sheehy; Wai Hong Wilson Tang; Kevin Shrestha; Xinmin S. Li; Michael Finucan; Alaa Gabi; Anuradha Guggilam; Charles Medert; Kristen Westfall; Allen Borowski; Olga V. Fedorova; Alexei Y. Bagrov; David Kennedy

*Presenting Author:* Brendan Sheehy

*Faculty Mentor:* David Kennedy

*Mentor's Department:* Cleveland Clinic Center for Cardiovascular disease

*Previous submission:* American College of Cardiology, March 14 2015, San Diego, CA

**8. NT-proBNP but Not Soluble Corin Levels were Associated with Preeclampsia in Pregnancy-Associated Hypertension**

Brendan Sheehy, Meera Kumari, Tracy Kovach, Mario Scarpino, Cynthia Kovach, Anne Coteleur, S. Jules Moodley, Yogesh Shah, Praful V. Maroo, Anjali P. Maroo, W. H. Wilson Tang

*Presenting Author:* Brendan Sheehy

*Faculty Mentor:* W. H. Wilson Tang

*Mentor's Department:* Cleveland Clinic Center for Cardiovascular disease

*Previous submission:* Abstract 14736, Circulation Dallas Scientific Sessions. 2013; 128:A14736. Nov 18, 2013

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David J. Dennis, BS; Alison M. Bales, BA; Robert C. Siska, BS; David J. Dennis, BS; Echo VanderWal PA; Harry VanderWal, MD2; Ronald J. Markert PhD; Mary C. McCarthy, MD FACS

*Presenting Author:* Jameson Dennis

*Faculty Mentor:* Mary McCarthy, MD

*Mentor's Department:* Surgery

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Stephanie Welsh; Matthew Cowan, DO, Janine Crantz, DO, William Nahhas, MD, Steven R. Lindheim MD

*Presenting Author:* Stephanie Welsh

*Faculty Mentor:* Steven Lindheim, MD

*Mentor's Department:* Obstetrics and Gynecology

*Previous submission:* Dayton Area Graduate Medical Education Community, Dayton OH, 2015

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Udit Singhal; Anirban Sahu, John R. Prensner, Qi Cao, Nithin Edara, Benjamin Chandler, Matthew K. Iyer, Irfan Asangnani, Xuhong Cao, Teng Ma, Arul M. Chinnaiyan

*Presenting Author:* Udit Singhal

*Faculty Mentor:* Arul Chinnaiyan, MD, PhD

*Mentor's Department:* Michigan Center for Translational Pathology

*Previous submission:* Howard Hughes Medical Institute Scientific Meeting of Medical Research Fellows, Chevy Chase, MD in May 2015

**12. Downregulation of miRs 203, 887, 3619, and 182 Prevent Vimentin-Triggered, Phospholipase D (PLD)-Mediated Cancer Cell Invasion.**

Kristen Fite, Julian Gomez-Cambronero, PhD

*Presenting Author:* Kristen Fite

*Faculty Mentor:* Julian Gomez-Cambronero, PhD

*Mentor's Department:* Biochemistry and Molecular Biology

*Previous submission:* Central Research Forum, Wright State University, Dayton, OH (October 2015), Basic and Clinical Department Researchers, Harvard Anaesthesia Departments (November 2015)

**13. True Posterior Myocardial Infarction.**

Saagar Sanghvi; Samuel Roberto MD, Theresa Ratajczak MD, Mukul Chandra MD

*Presenting Author:* Saagar Sanghvi

*Faculty Mentor:* Mukul Chandra, MD

*Mentor's Department:* Cardiology, Internal Medicine

*Previous submission:* Society of General Internal Medicine (SGIM) National Meeting - May 12, 2016; Hollywood, FL

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Kathryn Morrison; Dean Bricker, MD; Ronald Markert, PhD

*Presenting Author:* Kathryn Morrison

*Faculty Mentor:* Dean Bricker, MD

*Mentor's Department:* Internal Medicine

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Christen Johnson; Naila Khalil, MBBS, MPH, PhD

*Presenting Author:* Christen Johnson

*Faculty Mentor:* Naila Khalil, MBBS, MPH, PhD

*Mentor's Department:* Community Health

*Previous submission:* March 25, 2016: Dr. Wilbert C. Jordan MD Research Forum- Austin, Texas

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Divya Indrakanti; Rodrigo Cartin-Ceba; Gary S. Hoffman; Cees G. M. Kallenberg; Carol A. Langford; Peter A. Merkel; Paul Monach; Philip Seo; Robert Spiera; William St. Clair; Nadia K. Tchao; Steven R. Ytterberg; Ulrich Specks; John Stone; Dan Birmingham; Brad H. Rovin

*Presenting Author:* Divya Indrakanti

*Faculty Mentor:* Dr. Brad Rovin

*Mentor's Department:* Internal Medicine

*Previous submission:* Vasculitis Workshop 2015, London, UK; American Society of Nephrology, Kidney Week 2015, San Diego, USA

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Uchenna Conley; Thomas Krzmarzick, MD; Adrienne Stolfi, MSPH

*Presenting Author:* Uchenna Connley

*Faculty Mentor:* Thomas Krzmarzick, MD

*Mentor's Department:* Emergency Medicine **Should Extraperitoneal Bladder Injuries Be Repaired at the Time of Pelvic Examination?**

Kevin Purcell; Alison M. Bales BA; Julie Ferraiola MD; Michael J. Prayson MD; Diane M. Kimpel, APRN; MS, Ronald J. Markert PhD; Gregory Semon DO; A.P. Ekeh MD, FACS; Mary C. McCarthy MD, FACS

*Presenting Author:* Kevin Purcell

*Faculty Mentor:* Mary C. McCarthy, MD, FACS

*Mentor's Department:* Surgery

*Previous submission:* American Academy of Dermatology, Washington DC, May 5, 2016

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Maggie Sullivan; Jaclyn Scholtz

*Presenting Author:* Maggie Sullivan

*Faculty Mentor:* Smita Krishnamurthy, MD

*Mentor's Department:* Pathology

*Previous submission:* American Academy of Dermatology, Washington DC, May 5, 2016

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Elise Striebich

*Presenting Author:* Elise Striebich

*Faculty Mentor:* Mary T. White, PhD

*Mentor's Department:* Community Health

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Theresa Ratajczak, MD; Sara Yacyshyn; Heidar Albandar, MD; Parker Redlien, MD; Ronald Markert, PhD; Geetika Kumar, MD

*Presenting Author:* Sara Yacyshyn

*Faculty Mentor:* Geetika Kumar, MD

*Mentor's Department:* Internal Medicine

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Casey Walk; Malvika Sharma; Jeffrey Pence MD

*Presenting Author:* Casey Walk

*Faculty Mentor:* Jeffrey Pence, MD

*Mentor's Department:* Pediatrics

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Malvika Sharma; Kyra A Dawson DO; Maxfield D Richardson DO; Casey T Walk, Arturo Aranda MD; Jeffrey C Pence MD; David Meagher MD

*Presenting Author:* Malvika Sharma

*Faculty Mentor:* David Meagher MD

*Mentor's Department:* Pediatrics

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Molly Osterhage; Casey T Walk; Malvika Sharma; Rouzbeh R Ahmadian MD; Arturo Aranda MD; Jeffrey Pence MD; David Meagher MD

*Presenting Author:* Molly Osterhage

*Faculty Mentor:* David Meagher MD

*Mentor's Department:* Pediatrics

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Katherine Ochs; Brittainy Erby; Heather Skanes-DeVold, MD; Steven R. Lindheim, MD MMM; Janice Duke, MD; Candice Benoit, MD; Jerome L. Yaklic, MD; Rose Maxwell, PhD

*Presenting Author:* Katherine Ochs and Brittainy Erby

*Faculty Mentor:* Steven R. Lindheim, MD

*Mentor's Department:* Obstetrics and Gynecology

*Previous submission:* 71st American Society of Reproductive Medicine, Baltimore, MD, October, 2015 and 28th Annual Curtis L. Parker Student Research Symposium, Atlanta, GA 2016 Graduate Medical Education Award

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Kevin Bree; Adrienne Stolfi MSPH; Ryan Mast DO, MBA; Brenda Roman MD

*Presenting Author:* Kevin Bree

*Faculty Mentor:* Brenda Roman, MD

*Mentor's Department:* Academic Affairs

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Mark Serpico; Ross Maltz; Wallace V Crandall; Sandra C Kim; Jennifer L Doston; Brendan M Boyle

*Presenting Author:* Mark Serpico

*Faculty Mentor:* Brendan Boyle, MD

*Mentor's Department:* Pediatric Gastroenterology

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Jaren Liston; Abdulfatah Issak, MD ; Karishma Samtani, MD; Dean Bricker, MD ; Ronald Markert, PhD

*Presenting Author:* Jared Liston

*Faculty Mentor:* Dean Bricker, MD

*Mentor's Department:* Internal Medicine

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Jaclyn Scholtz; Jared Liston

*Presenting Author:* Jaclyn Scholtz

*Faculty Mentor:* Therese Zink, MD

*Mentor's Department:* Family Medicine

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Katherine Helmuth; Gregory Toussaint, MD; Adrienne Stolfi, MSPH; Bruce Binder, MD, PhD; Shalini Forbis, MD, MPH.

*Presenting Author:* Katherine Helmuth

*Faculty Mentor:* Shalini Forbis, MD

*Mentor's Department:* Pediatrics

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Andrew Steffensmeier; Karen Kirkham, MD; John Wiemann, MD

*Presenting Author:* Andrew Steffensmeier

*Faculty Mentor:* Karen Kirkham, MD; John Wiemann, MD

*Mentor's Department:* Internal Medicine; Orthopaedic Surgery

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Trisha Miller; Richard Rapp, PhD; Lucinda Brown, RN, Hannah Redding

*Presenting Author:* Trisha Miller

*Faculty Mentor:* Richard Rapp, PhD

*Mentor's Department:* Community Health

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Justin Kelley; Kazia Parsons; Kaci Webb; Marie Walters

*Presenting Author:* Justin Kelley

*Faculty Mentor:* Nikki Rogers, PhD

*Mentor's Department:* Community Health

**33. Time to Diagnosis of Autism Spectrum Disorder.**

Erin Nealon; Craig Boreman, MD; Adrienne Stolfi, MSPH; Shalini Forbis, MD, Caitlyn McComb

*Presenting Author:* Erin Nealon

*Faculty Mentor:* Craig Boreman, MD

*Mentor's Department:* Pediatrics

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Omeed Jazayeri-moghaddas; Tse W; Gans AJ; Herzing KA; Markert RJ; Mary McCarthy, MD

*Presenting Author:* Omeed Jazayeri-moghaddas

*Faculty Mentor:* Mary McCarthy, MD, FACS

*Mentor's Department:* Surgery

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Anthony Oddo; James Ebert MD, MPH

*Presenting Author:* Anthony Oddo

*Faculty Mentor:* James Ebert MD, MPH

*Mentor's Department:* Pediatrics

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Matthew Brown; Padmini Krishnamurthy, MD; Sangeeta Agrawal, MD; Robert F Short MD, PhD

*Presenting Author:* Matthew Brown

*Faculty Mentor:* Sangeeta Agrawal, MD

*Mentor's Department:* Internal Medicine, Gastroenterology

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John Sullenbarger; Michael Albert, MD; Chris Wild, MD

*Presenting Author:* John Sullenbarger

*Faculty Mentor:* Michael Albert, MD

*Mentor's Department:* Orthopaedic Surgery

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Matthew Knapke; L. Ilyas, MD; T. Bozung, MD, MPH; J. Embree; J. Vossler; M. Jacobson, DO, MPH, P. Hersherberger, PhD; J. Wilson, DDS, PhD

*Presenting Author:* Matthew Knapke

*Faculty Mentor:* Therese Zink, MD

*Mentor's Department:* Family Medicine

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Kasey Parker; Sonia I. Bennett, MD, MPH; Ronald J. Markert, PhD

*Presenting Author:* Kasey Parker

*Faculty Mentor:* Ankur Gupta, MD

*Mentor's Department:* Internal Medicine



**40. Iron Deficiency Causing Abnormal Thyroid Function.**

Kasey Parker; Sonia I. Bennett, MD, MPH

*Presenting Author:* Kasey Parker

*Faculty Mentor:* Ankur Gupta, MD

*Mentor's Department:* Internal Medicine

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Brian Patterson; Aaron Hollis Palmer; Peter Ekeh, MD, MPH, FACS

*Presenting Author:* Brian Patterson

*Faculty Mentor:* Peter Ekeh, MD

*Mentor's Department:* Surgery

*Previous submission:* Oral Presentation at Academic Surgical Congress Jacksonville, FL February 2016

**42. Barber Say Syndrome: A Case Report.**

Jennifer Hilgeman; M. David Yohannan, MD; Kaitlin Allsbrook

*Presenting Author:* Jennifer Hilgeman

*Faculty Mentor:* Mulakkan David Yohannan, MD

*Mentor's Department:* Neonatology

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Matthew Dorweiler, MD; David Swanson, MS, Sunishka Wimalawansa, MD

*Presenting Author:* David Swanson

*Faculty Mentor:* Sunishka Wimalawansa, MD, MBA

*Mentor's Department:* Plastic Surgery

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Hershel Dobkin; Marc Lubitz

*Presenting Author:* Hershel Dobkin; Marc Lubitz

*Faculty Mentor:* Mary T. White, PhD

*Mentor's Department:* Community Health

**45. Quality Improvement Project on Data Collection Methods on Graduating Medical Students.**

Eric Thuney; John Donnelly, MD; Jayna Vossler

*Presenting Author:* Eric Thuney

*Faculty Mentor:* John Donnelly, MD

*Mentor's Department:* Family Medicine

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Austin Williams; B. Adam Bolyard, DO; Mamle Anim, MD; Thomas Koroscil, MD

*Presenting Author:* Austin Williams

*Faculty Mentor:* Mamle Anim, MD

*Mentor's Department:* Internal Medicine

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Michael Robertson; Donald Clark, MD; Meagan Moe, B.S.

*Presenting Author:* Michael Robertson

*Faculty Mentor:* John Donnelly, MD

*Mentor's Department:* Family Medicine

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David Cook; Kazia Parsons; Bradley Jacobs, MD; Capt. Jon Pollock, MD; Thomas Pitts, MD

*Presenting Author:* David Cook

*Faculty Mentor:* Bradley Jacobs, MD

*Mentor's Department:* Neurology

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Kazia Parsons; David Cook; Bradley Jacobs, MD, MS; Thomas Pitts, MD; Capt. Jonathan Pollock, USAF, MD

*Presenting Author:* Kazia Parsons

*Faculty Mentor:* Bradley Jacobs, MD

*Mentor's Department:* Neurology

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Colleen Begley; Andrea Frazier; Larrilyn Yelton; Mukund Dole, MD; Ayman El Sheikh, MD; Jordan Wright, MD; Adrienne Stolfi, MSPH; Shalini Forbis, MD, MPH

*Presenting Author:* Colleen Begley; Andrea Frazier; Larrilyn Yelton

*Faculty Mentor:* Adrienne Stolfi, MSPH

*Mentor's Department:* Biostatistics, Pediatrics

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Alexander Cook; Catherine A. Marco, MD; Julie Whitis; James Xidas; Bonnie Egan; Dennis Mann, MD, PhD; James E. Olson, PhD

*Presenting Author:* Alexander Cook

*Faculty Mentor:* Catherine Marco, MD

*Mentor's Department:* Emergency Medicine

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Katherine Bruening; Adrienne Stolfi; Shalini Forbis, MD, MPH; Craig Boreman, MD

*Presenting Author:* Katherine Bruening

*Faculty Mentor:* Craig Boreman, MD

*Mentor's Department:* Pediatrics

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Kaitlyn Steffensmeier; Susan Pena-Almazan, MD; Paul Breyer, MD; Leonardo Canessa, MD

*Presenting Author:* Kaitlyn Steffensmeier

*Faculty Mentor:* Susan Pena-Almazan, MD

*Mentor's Department:* Pediatrics

**53. Distinct Morphological and Biochemical Changes Associated With Mitogenesis in Murine T Lymphocytes.**

Jennifer Gibson; Pavani Beesetty; J. Ashot Kozak, PhD

*Presenting Author:* Jennifer Gibson

*Faculty Mentor:* J. Ashot Kozak, PhD

*Mentor's Department:* Neuroscience Cell Biology and Physiology

*Previous submission:* Central Research Forum, Wright State University, Dayton, OH (2015)

**54. Chronic Myelogenous Leukemia, Accelerated Phase in a 3 Year Old Girl.**

Melanie Stall; Mukund Dole, MD; Ayman El-Sheikh, MB ChB

*Presenting Author:* Melanie Stall

*Faculty Mentor:* Mukund Dole, MD

*Mentor's Department:* Pediatrics

**55. Effects of High-Fidelity Simulation on Student Perceptions of Interprofessional Education.**

Karissa Chow; Trevor Stump, Mckenzie Shenk; Becky Brown

*Presenting Author:* Karissa Chow

*Faculty Mentor:* Raymond Ten Eyck, MD

*Mentor's Department:* Emergency Medicine

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Bonnie Chow; Matthew Huang; Andrew Hawk, MD; Catherine Marco, MD

*Presenting Author:* Bonnie Chow

*Faculty Mentor:* Catherine Marco, MD; Andrew Hawk, MD

*Mentor's Department:* Emergency Medicine

**57. Preliminary Findings Regarding Patients' Attitudes Towards Genetic Carrier Testing (GCS).**

Allison Briggs, DO; Parvaneh Nouri, BS; Jerome L. Yaklic, MD; Rose Maxwell, PhD; Kathleen O'Leary, MD; Steven R. Lindheim, MD, MMM

*Presenting Author:* Parvaneh Nouri

*Faculty Mentor:* Steven R Lindheim, MD, MMM

*Mentor's Department:* Obstetrics and Gynecology

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Allison Briggs, DO; Parvaneh Nouri, BS; Kathleen O’Leary, MD; Jerome L. Yaklic, MD; Rose Maxwell, PhD; Steven R. Lindheim, MD, MMM

*Presenting Author:* Parvaneh Nouri

*Faculty Mentor:* Steven R Lindheim, MD, MMM

*Mentor’s Department:* Obstetrics and Gynecology

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Dana M. Coleman; Ronald J. Markert, PhD; Mbaga S. Walusimbi MD, FACS

*Presenting Author:* Dana Coleman

*Faculty Mentor:* Mbaga Walusimbi, MD, FACS

*Mentor’s Department:* Surgery

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Paige Sutton; Rachael Libertin; Stephanie Welsh; Juanita Draime

*Presenting Author:* Paige Sutton

*Faculty Mentor:* Paul J. Hershberger, PhD

*Mentor’s Department:* Surgery

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Symposium Directors: Ahmed Hawash, Jacob Vincent  
Associate Symposium Directors: Larrilyn Yelton, Casey Walk, and Zachary Braunstein  
Assistant Symposium Directors: Jennifer Barbadora, Paul Lang, and Jonathan Bakos





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