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

Wright State University Boonshoft School of Medicine Office of Research Affairs

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The Third Annual Medical Student Research Symposium culminates a 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, Translational Research Lecture Series, and a new M1 elective course, *Introduction to the Research Learning Community* (SMD 616). For more information, please visit the Research Learning Community at:

https://www.medu.wright.edu/rlc
PROGRAM

Opening .................................................................................................................................................. 5:45pm
Atrium

Welcome & Distinguished Scholar Lecture ............................................................................................. 6:00pm
Auditorium

Poster Presentations and Reception ....................................................................................................... 6:30pm
Atrium

Awards ................................................................................................................................................... 8:00pm
Atrium

2011 Distinguished Scholar

Katie L. Bullinger, Ph.D., MS4

Dr. Katie Bullinger is an MD/PhD candidate at the Wright State University Boonshoft School of Medicine. In 2009, she completed Ph.D. studies in Biomedical Science with a concentration in Neuroscience and Physiology in the laboratory of Timothy Cope, Ph.D. Using in vivo electrophysiological and immunohistochemical techniques, her dissertation, Cellular Function of the Ia-motoneuron Circuit Following Peripheral Nerve Regeneration, provides new insight into mechanisms underlying absent stretch reflexes and uncoordinated motor activity following the successful regeneration of an injured peripheral nerve. She also studied and elucidated adverse effects of chemotherapeutic agents on sensory transduction in peripheral proprioceptors. Dr. Bullinger has numerous scientific publications in peer-reviewed journals and has presented her work at both national and international conferences. In addition to her scientific work, Dr. Bullinger served as a Student Trustee to the WSU Board of Trustees and has sat on various WSU committees including the Building and Grounds Committee, Parking and Transportation Committee, Graduate Studies Dean Student Advisory Board, BSOM Admissions Committee, and the BSOM Global Health Initiative. She is a member of the American Academy of Neurology, Society for Neuroscience, American Association for the Advancement of Science, and the American Physician Scientists Association, where she served as the BSOM institutional representative and as a member of the finance committee. She has participated in several community outreach programs, including the St. Vincent de Paul Tutoring Program, Horizons in Medicine, and Student-to-Student. Dr. Bullinger is currently completing her M4 year and will begin residency training in Interventional Neurology at Emory University in Atlanta, Georgia following a transitional year at Kettering Memorial Hospital in Dayton, Ohio.
“In order to stay abreast of the constant evolution of knowledge within the medical field, medical research, in my mind, is a must. Additionally, as future physicians, we should train our minds to function dynamically and think critically, and this is one of the many benefits that I feel medical research provides.”

“I chose to do research to make myself a more competitive applicant for when I apply to residency programs. As many programs are becoming increasingly competitive it is important to make yourself stand out as an applicant. Having research experience increases your competence as a physician in training and shows residency programs that you are committed to learning and advancing the body of medical knowledge.”

“Basic neuroscience research has provided me with an understanding of the process of methodologically identifying pathologic mechanisms in neurologic disorders and has allowed me to begin to think about ways in which interventions could impact patients for the better. As I begin a career in neurology, I look forward to the many new advances which will come as a result of the current research being done in the neurosciences and hope that, at least in a small way, I can be a part of it.”

“I chose to do research during medical school because I was interested in a career in academic medicine. As it turned out, I enjoyed the intellectual challenge that comes with research, the independence to design and carry out experiments, the mentorship from my faculty advisor and committee members, and the knowledge that I was helping to advance my field.”

“Participating in research offers a change of pace from the normal medical school curriculum. It allows you to advance your knowledge and explore something new that may have sparked your interest. It is exciting to be a part of the scientific process and something that I think all students should pursue.”

“The benefits of research are numerous. A research experience guarantees that through literature review and discussions with colleagues and mentors that you’ll advance your own personal knowledge. Furthermore there is a great chance that you’ll be a part of a new discovery that could potentially benefit patients in the future.”

“I pursued research in medical school because I was curious about the scholarly basis of evidence-based public health practice and clinical recommendations. Because research is encouraged in the Boonshoft Physician Leadership Development Program, a double degree program with MD/MPH as well as MD/MBA students with a focus on leadership in health care and the greater community, it was a perfect fit!”

“Working with researchers from several disciplines including health education and promotion, epidemiology, and population health, allowed me to see how professionals with different areas of expertise work together to address extremely interesting research questions.”

“I want to help improve the way we practice medicine, and research is critical to improving patient outcomes.”

“Research has given me a better skill set and more in-depth understanding of the disease process. It is important to not only learn how to answer a question, but also to ask it.”
Assessment and Management of Adult Obesity in a Primary Care Practice
Sherry Adkins, MD, MPH candidate, Marietta Orlowski, PhD, Sylvia Ellison, MA

Presenting Author: Sherry Adkins
Poster Number: 7

Purpose: The purpose of this project was to describe primary care physician adherence to National Heart Lung and Blood Institute (NHLBI) Clinical Guidelines on the Identification, Evaluation, and Treatment of Overweight and Obesity in Adults (1998), and to explore patient characteristics associated with physician assessment and management behaviors. Patient characteristics included age, sex, race, BMI, associated disease risk, and Medicaid coverage.

Methods: A chart abstraction of 100 randomly selected adult patients with at least one visit to a particular hospital-affiliated primary care practice during a 12-month period was completed. Patients were not pregnant during the year of review, and had a Body Mass Index of 25 or greater. The Physician Obesity Guideline Behavior Scale was developed to score physician obesity assessment and management behavior as recorded in the patient chart.

Results: Only 25% of clinically overweight or obese adult patients had actually been diagnosed as such. All patients had a weight/height recorded in the chart and 60% included a BMI. The majority of patients did not receive any dietary (72%) or physical activity (69%) management. When dietary management was introduced, those patients received either information (68%) or a goal (32%), and none received a goal with an accompanying plan. In cases where physical activity management was introduced, patients received a goal (52%) or information (39%), with few (10%) receiving a goal with accompanying plan. Preliminary findings suggest that physician assessment and management behaviors vary by patient characteristics.

Epidemiology of Cervical Fractures in Adults aged 18-44
Matthew Binkley, Nicolas Grisoni MD, Richard Laughlin MD, Peter Ekeh MD, Andrew Burleson

Presenting Author: Matthew Binkley
Poster Number: 6

Background: Previous studies examining the epidemiological features of C-spine fractures have focused on the entire age spectrum of patients, on elderly patients (> 65yrs) or on the pediatric population. We sought to identify features of C-spine fractures specific to the young adult population, (18 – 44 yrs) examining factors such as mechanism of injury, level of fractures, associated injuries and mortality that may differ from what has been historically reported in other age groups.

Methods: All patients aged between 18 – 44 yrs with C-spine fractures over a 12-month period admitted to a Level I Trauma Center were identified from the Trauma Registry. Multiple data points including demographics, mechanism of injury, associated injuries remote to the spine and cervical level fractured were noted.

Results: In the period studied, 66 patients with C-spine fractures were identified in the established age range. (74% male). Motor vehicle crashes (MVCs) were the most common mechanism of injury. (74.2%) Sports-related injuries (9.1%), falls (9.1%) and gunshot wounds (6.1%) were other mechanisms. The C7 level was the most frequent site of fracture involvement - seen in over half of the patients. (51.5%) C1 or C2 fracture involvement was present in only 16.7% of this population. Associated injuries occurred in 74.2% of patients – head injuries being the most frequent in two-thirds of cases. The overall mortality rate was 6.1%. Conclusion: Young adults (18 – 44yr old) demonstrate different features from those historically reported in epidemiologic studies of C-spine fractures - particularly in those examining elderly populations. A greater male preponderance, a higher incidence of associated injuries, and more injuries from MVCs than falls, and more frequent involvement in the lower C-
spine are some of the specific features identified in young adults.

**A Case Series on Topical Concentrated Capsaicin as an Option to Treat Refractory Post Herpetic Neuralgia**

Cole Budinsky, Simon Choi, Richa Garg, and Amol Soin, MD, MBA

*Presenting Author: Cole Budinsky
Poster Number: 21*

Post Herpetic neuralgia is a debilitating pain condition that occurs after an infection with the Herpes Zoster virus. Typically the patient notices a rash that is unilateral and affects a single dermatome. Typical patients notice symptoms consistent with neuropathic pain, which includes burning, irritation, allodynia, and hypersensitivity to touch. Current treatment modalities include antiviral medications such as: acyclovir, topical lidocaine applied directly over the affected dermatome, and neuropathic pain agents such as Neurontin or Pregabalin. We proposed using a supraphysiologic form of capsaicin. This formulation is unlike the current standard formulation of capsaicin. The medication we used is in the form of a patch known as Quetenza, which has a concentration 300 times greater than over the counter capsaicin. This algorithm using Quetenza to treat refractory post herpetic neuralgia represents a novel and new approach to treat this pain condition.

Three consecutive patients who suffer from severe, chronic, debilitating and refractory pain from post herpetic neuralgia were identified. We used a protocol where the patients had EMLA (Eutectic Mixture of Local Anesthetic) applied directly over the affected dermatome for approximately 1 hour prior to Capsaicin administration. This was done to prevent irritation and pain related to Capsaicin, which is a known skin irritant. Following the EMLA administration, the Capsaicin patch was placed over the affected dermatome. The patch was left on for approximately 1 hour. Every 15 minutes vital signs and VAS (visual analog pain scale) pain score was assessed. All three patients noticed burning pain and irritation near the site of the patch within 30 minutes of application. The VAS increased by an average of 34% in all three patients—an expected result of the Capsaicin application. At the conclusion of the cases, the patch was removed and a cooling moisturizing cream was administered to decrease the irritation patients experienced.

The patients followed up at 2 week and 1-month intervals. At the 2 week interval pain reduction was recorded as: 20, 100, and 45 percent, in patients #1, #2, and #3, respectively. At the 1-month follow up patients noted similar pain reduction scores. The mechanism of action of Capsaicin is believed to be the depletion of neurotransmitters involved in sending pain signals. Once depleted, overall pain perception diminishes.

It is believed that this is a short-term treatment, and patients are currently scheduled to return at the 6-month interval. These results represent an initial snapshot of our first three patients, continued patient recruitment and follow-up is planned. Further data is required to provide statistically significant data, but initially it does appear that this treatment algorithm provides promise in achieving some pain relief in patients with post herpetic neuralgia that is refractory to other treatment modalities.

**Semitendinosus Muscle Fatty Infiltration Following Tendon Resection in Rabbits**

Vourazeris JD, Lawless MW, Markert R, Burleson AP, Boivin GP

*Presenting Author: Andrew P. Burleson
Poster Number: 5*

The current gold standard for anterior cruciate ligament (ACL) reconstruction is to use either a bone-patellar tendon-bone (BPTB) autograft or a hamstring tendon (HT) autograft. Each has advantages and disadvantages but it is unclear which results in the best outcome. Reviews do not show consistent differences between the two graft types. Excellent functional results are reported for patients who had a BPTB graft. However, the BPTB graft is associated with multiple morbidities including postoperative patellofemoral pain, chondrosis, patellar fractures, patellar tendon ruptures, and quadriceps weakness. Many surgeons prefer the HT graft because of the morbidities associated with the BPTB graft. In addition, previous studies show the HT graft has superior biomechanical stability, and better
approximates the anatomy and functionality of the normal ACL. In follow-up studies of patients who have undergone ACL reconstruction with a HT graft, patients regain near normal hamstring strength within 3 years. However, a number of recent studies demonstrated that hamstring strength deficits persist even after 3 years, especially in deep knee flexion and internal rotation. Many recent reports have described in detail the morphological and histological regeneration of the hamstring tendon after resection. However, relatively little research has been done to elucidate similar information about the hamstring muscles.

Studies in the rotator cuff demonstrate that after transection the muscles become infiltrated with fat. No studies have examined the microstructural changes that occur in hamstring muscles following tendon harvest. We hypothesize that following tendon transection there will be fatty infiltration of the muscle and that this infiltration will progress with time.

**The Hidden Curriculum: What are psychiatry clerkship students really learning?**
Joy Chang; Nicole Borges, PhD; Brenda Roman, MD

*Presenting Author: Joy Chang*
*Poster Number: 16*

**Background:** In addition to formal lectures and texts, there exists an important constituent in medical education dubbed “the hidden curriculum” by medical sociologist F. W. Hafferty. This study serves to investigate what students are actually learning in the amorphous setting of the psychiatry clerkship by exploring whether students are identifying preceptor behavior and actions as conflicting with their own belief of what is acceptable. **Method:** 62 fourth year medical students (61% response rate) completed a 4-question survey with a modified Likert scale on topics of inappropriate use of medical terminology (i.e. diagnostic labeling), dark humor, process of involuntary commitment and feelings of personal safety. Students also had the option to provide comments. **Results:** To the question regarding the occurrence of inappropriate use of medical terminology, 46.8% responded “never”, 45.2% responded “occasionally”, and 8.1% responded “frequently”. Regarding inappropriate humor, 37.1% of students responded “never”, 58.1% responded “occasionally” and 4.8% responded “frequently”. 90.3% of students responded “never” seeing inappropriate application of involuntary commitment criteria and 9.7% responded “occasionally”. 56.6% “never” feared for their safety on clerkship, 41.9% “occasionally” and 1.6% “frequently” did. **Conclusion:** These results reveal a concerning number of issues that need to be addressed in the formal curriculum of not only medical students, but also in the continuing education of resident and practicing physicians. There is particular irony in the high numbers of students who report witnessing psychiatry preceptors and residents using inappropriate humor towards psychiatric patients and improperly using psychiatric terminology.

**An Expanded Study Comparing Spinal Cord Stimulation Sensations Using an Observational Mechanical Gateway**

Sara Chinnappan, Telisha Ortiz, Cole Budinsky, Dr. Amol Soin, MD, MBA

*Presenting Author: Sara Chinnappan*
*Poster Number: 24*

Observational Mechanical Gateway (OMG) is a device that allows Boston Scientific to attach independent controls to leads implanted by other spinal cord stimulator manufacturers. The OMG is essentially a reproduction of Boston Scientific’s IPG utilizing their Multiple Independent Control. The OMG is a device that allows for the patient to “try” the stimulation from a competing device (Boston Scientific) company. Critics mention that this is a controversial technique that has oftentimes been labeled as a gimmicky sales tactic. Proponents mention that it is an avenue for the patient to “experience” different stimulation technology. The author decided to test the OMG process to better understand the procedure, and to see what differences in stimulation were noted.

Seven consecutive patients, who required spinal cord stimulation phase I trials were given the chance to participate in the OMG process. Of the seven patients, one patient had a diagnosis of reflex sympathetic dystrophy (Medtronic) and six had a diagnosis of failed back/post laminectomy
syndrome (St. Jude). Each patient had his or her trial leads placed for a 7-day trial. On day 7 of the trial, prior to the lead pull, the patients had an OMG session for 30 minutes. After conducting the OMG, all seven patients reported feeling a “smoother” and “more comfortable” stimulation with the OMG than with their initial trialed device. All seven patients stated they felt the coverage of pain was broader as far as surface area covered with the OMG in comparison to their trialed device. When asked if this was significant enough to switch to Boston Scientific, four of the patients desired to switch. None of these four patients reported an improved VAS pain score with the OMG. When asked why they did not want to switch devices 3 out of 3 mentioned that they received similar pain relief with both devices and that they were already comfortable with the current system they were using for the trial week and 2 out of 3 patients mentioned their positive relationship with the representative from their trialed device as a big factor to not switch. All seven patients were successful trials, and each went to permanent phase II implantation using their original trialed device. Further study with larger sample sizes is warranted to draw any type of clinically significant conclusion.

Air Versus Saline for Loss of Resistance
Simon Choi, Bryan Hill, Cole Budinsky, Amol Soin, MD, MBA

Presenting Author: Simon Choi
Poster Number: 26

The differential diagnosis of air in the epidural space encompasses benign and serious sequelae of instrumentation of the epidural space. Air can be introduced during the loss of resistance technique, the injection of medication into the epidural space or placement of an epidural catheter, and it can enter the space during continuous infusion of medication. Air can also arise in the epidural space due to air producing bacteria in the case of infectious meningitis. Additionally, air can produce a pneumocephalus after direct injection into the subarachnoid or subdural space, and it has also been shown to occur after a routine lumbar epidural steroid injection secondary to a dural defect.

In the case, the patient developed a severe, constant headache after the placement of a spinal cord stimulator trial. Air was used for the loss of resistance technique to obtain access into the epidural space. During the loss of resistance, cerebral spinal fluid was noted to come out of the touhy needle. A prophylactic blood patch was administered in the recovery room, however the patient continued to complain of a headache for several days. Eventually, a workup for meningitis proved to be negative, but a CT scan showed a pneumocephalus. It was thought that the headache symptoms were the result of a pneumocephalus caused by air entrainment in the epidural space possibly by the loss of resistance technique. The patient was treated prophylactically with intravenous antibiotics for the prevention of meningitis, and the patient's headache resolved spontaneously over one week.

Air in the epidural space can be the result of numerous causes. Here we discussed a case that demonstrated the impact that air in the epidural space can have on diagnosis and management of the patient. In the acute setting, the onset of headache after instrumentation of the epidural space can occur secondary to: post dural puncture headache, pneumocephalus, migraine, or subarachnoid hemorrhage. Traditionally a post dural puncture headache arises within 24 to 48 hours after instrumentation. Patients can experience a positional headache, with symptoms being worse on standing and improving in the supine position. A subarachnoid hemorrhage is a very rare and dangerous cause of an acute severe headache that requires immediate neurosurgical intervention. Mortality rates approach 50% in this case. A pneumocephalus should be considered as a cause especially if air was used as the loss of resistance technique. A CT scan can be done in this setting to diagnose a pneumocephalus. In the chronic setting, a pneumocephalus can occur secondary to long-term epidural infusions via: air being accidentally injected through the catheter, air used for loss of resistance, meningitis, or infectious sequelae.
**Intrathecal Bupivacaine and Ziconotide via a Patient Therapy Manager as a Non-Opioid Based Treatment for Chronic Pain**

Christo Frangopoulos, Stephen Sams, Cole Budinsky, Amol Soin MD, MBA

*Presenting Author: Christo Frangopoulos  
Poster Number: 20*

**Introduction:** Intrathecal (IT) modalities have commonly been used to treat chronic pain states for the past three decades. Currently, the most often used IT agents are opioids including morphine, hydromorphone, and fentanyl. However, we sought a non-opioid based therapeutic approach due to a number of complications associated with opioid based IT therapies such as granuloma formation, addiction, tachyphylaxis, dose escalation and drug dependency. This approach involved administration of bupivacaine mixed with ziconotide (Prialt®) via continuous infusion through an implanted intrathecal pump, while the patient also used a Patient Therapy Manager (PTM), a device similar to a patient-controlled analgesia (PCA) device, to bolus more medication on an as needed basis.  

**Methods:** The patient was a male in his mid-40s who suffered from severe chronic lumbar radiculopathy following a weight lifting accident that subsequently led to three major spinal surgeries. The patient had both a spinal cord stimulator and an intrathecal pump (ITP) implanted by an outside facility. He required rapid dose escalation of his intrathecal pump with several opioids due to his increasing tolerance. Not wanting to be dependent on opioids, the patient went through a chronic pain rehabilitation program and weaned off of intrathecal opioids culminating with an ITP sustained by saline. We acquired the patient at this time, and decided to take a non-narcotic-based treatment approach by infusing bupivacaine and Prialt®.  

**Results:** Bupivacaine was the primary medication in the ITP, while Prialt® was run as the secondary medication. Continuous infusions of bupivacaine and Prialt® were dosed at 6.5mg/day and 2.4mcg/day, respectively. The patient was also given a PTM device which delivered 0.650mg/bolus of bupivacaine and 0.24mcg/bolus of Prialt®, which he would use 5-7 times per day. The patient noted 40% reduction in overall pain measured subjectively by the VAS (Visual Analog Scale) and a 50% improvement in functional status. Side effects included excessive numbness in the peri-abdominal area, mild urinary retention, and occasional nausea when the PTM was used more than 7 times per day.  

**Conclusions:** Intrathecal bupivacaine mixed with Prialt® infused continuously through an implanted pump represents a possible non-opioid based treatment for chronic pain. Additionally, using the PTM device allows the patient to bolus medication and titrate the medication delivery to treat the patient’s pain needs. Further studies are warranted with additional patients; based on this case report, however, this modality is a feasible option to treat chronic pain.

**Cadaveric Implantations of a Peripheral Nerve Stimulating Spiral Cuff**

Richa Garg, Cole Budinsky, Amol Soin, MD, MBA

*Presenting Author: Richa Garg  
Poster Number: 23*

With the rise of ultrasound for peripheral nerve blocks, anesthesiologists have been able to become more precise with needle and continuous catheter placement for analgesia. As neuromodulation techniques to achieve analgesia become more advanced, placement of neuromodulation stimulating leads in the periphery will invariably become more common. To truly neuromodulate a peripheral nerve, the lead is placed on the peripheral nerve and is subsequently anchored for long-term stimulation/blockade. Traditionally, the lead is then attached to an internal pulse generator for continuous stimulation. Because placement of such a surgical cuff electrode near a peripheral nerve is not a technique typically done by an Anesthesiology trained pain management physician, the cadaveric dissection was completed to demonstrate the feasibility of a peripheral nerve stimulating lead/electrode.

Human cadaveric dissections were carried out for the upper and lower extremity in which dissection was done down to major peripheral nerves (including the femoral, median, ulnar, sciatic, posterior tibial, and common peroneal
nerve) while major anatomic structures such as blood vessels and muscle groups were maintained intact. These dissections demonstrate the feasibility of placing an electrode on or near any of the three major nerve groups: Sciatic, Peroneal, or Tibial. Mock-ups of peripheral nerve stimulating leads were used to demonstrate placement. Figure 1 depicts a peripheral nerve stimulating lead near the ulnar nerve in the upper extremity. This seems to be the simplest site for placement of such a lead prior to entering the olecranon proximal to the elbow, where the ulnar nerve is easily visible and located superficially in the skin here. Figure 2 demonstrates a dissection focused in the popliteal fossa, in which a peripheral nerve stimulating lead is placed near the peroneal nerve just distal to the sciatic nerve as it splits into the peroneal and tibial branches. Figure 3 depicts an electrode near the sciatic nerve. Figure 4 is an anterior view of the lower extremity in which the electrode is seen near the femoral nerve, with the femoral artery left intact nearby.

The mechanism of HFAC Block is distinct from SCS and TENS Electrical currents, as it produces activation or a block of nerve conduction through its influence on the voltage-gated ion channels in the nerve membrane. HFAC appears to block nerve conduction through depolarization of the nerve membrane, despite the fact that there is zero net charge delivered to the tissue. This creates a complete depolarizing nerve block, acting similar to the mechanism involved in “electric lidocaine,” thereby opening the door for a lot of options related to peripheral neuromodulation, as well as nerve blockade. In order for this to occur, the implanting physician most likely has to place the lead directly on the nerve via the placement of a surgical cuff stimulating lead.

High frequency alternating current represents a feasible avenue from which to treat several chronic pain conditions. HFAC has the potential to create a reliable and gradable nerve block, which can serve as an effective method to achieve analgesia. HFAC can also be used to treat: post surgical neumomas, chronic headaches, peripheral limb and nerve pain, as well as post amputation residual limb pain.

**Translucent blue facial papule on an 89 year old man**
Thomas J. Hagele, BS; Charles Chiang, MD; Rocco Serrao, MD; Julian J. Trevino, MD

*Presenting Author:* Thomas J. Hagele  
*Poster Number: 27*

An 89 year old male with no significant past medical history presented with a slow–growing, asymptomatic translucent blue mass noticed one year prior to evaluation. Review of symptoms was negative for constitutional symptoms, GI disturbance, and visual complaints. Physical evaluation revealed a 4 mm firm light blue translucent papule on the left medial canthus. No cervical nor axillary adenopathy was present. No further lesions were identified during full body skin examination, including chest wall masses. A histopathological study was performed with H&E and periodic acid-Shiff stains, which confirmed a diagnosis of mucinous carcinoma.

Primary cutaneous mucinous carcinomas are rare malignancies, which can occur in patients of any age and race. Distinguishing primary from metastatic disease is of utmost clinical importance. We present a case of a patient with primary cutaneous mucinous carcinoma and discuss the epidemiology, signs and symptoms, differential diagnosis, histopathology, and treatment of this condition.

**Fluoroscopically Guided Minimally Invasive Lumbar Decompression to Treat Spinal Stenosis**
Bryan Hill, Amol Soin, MD, MBA, Cole Budinsky, Simon Choi, Sara Chinnappan, Telisha Ortiz, Christo Frangopolous

*Presenting Author:* Bryan Hill  
*Poster Number: 19*

Lumbar spinal stenosis affects more than 1.5 million Americans and can be a debilitating cause of low back pain. Often times, these patients are unable to maintain acceptable activities of daily living and seek options to help manage their pain. Current modalities used to treat lumbar spinal stenosis include physical therapy, traction, chiropractic care, medical management, epidural steroid injections, and even invasive surgery.
However, there is a large population who suffer from spinal stenosis and fail conservative care, but who are not candidates for invasive spinal surgical intervention. We performed a case series interpretation of a new treatment modality, minimally invasive lumbar decompression (MILD). MILD is a technique done under fluoroscopy to perform a laminotomy and debulking of the ligamentum flavum, thereby achieving lumbar decompression and reduction of stenosis symptoms.

The inclusion criteria included patients who have symptomatic lumbar spinal stenosis caused primarily by dorsal element (ligamentum flavum) hypertrophy, failure of conservative therapy, central canal cross sectional area < 10 mm², radiological confirmation of ligamentum flavum of at least 2.5 mm by MRI, anterior lysis of < 5 mm, able to ambulate at least 10 feet unaided before being limited by pain. 10 patients were identified for the case series. The patients underwent the minimally invasive lumbar decompression (MILD) technique by the primary author. Follow up occurred at 2 weeks and then at 6 weeks. The patients were asked to complete a survey preoperatively and postoperatively. Patients were asked to rate their VAS pain score 0-10 at the current moment and rank the VAS score when at its best and worst over the past week in the preoperative and postoperative periods. Postoperatively, patients were also asked to rate their perceived percentage of improvement in physical function at the 2 week and 6 week periods.

The MILD technique also demonstrates decompression of lumbar spinal stenosis by reviewing intraoperative epidurography performed in the pre-MILD and post-MILD period.

The minimally invasive lumbar decompression technique represents a new tool for the interventional pain management trained physician to treat patients who suffer from lumbar spinal stenosis. This outpatient technique shows promise in reduction of the patients’ overall VAS pain score and a perceived percentage improvement in functional status.

This study was limited by the small number of patients studied and the fact that the improvements were based on subjective patient surveys and not objective measurements of physical function.

Ca²⁺-activated K⁺ channels limit the chemosensitive response of locus coerules (LC) neurons
Ann N Imber and Robert W Putnam

Presenting Author: Ann N. Imber
Poster Number: 2

LC neurons are chemosensitive, increasing firing rate in response to hypercapnia through pH inhibition of K⁺ channels. This “accelerator” pathway is believed to set central respiratory gain. Using whole cell patch clamp, we found that hypercapnia activates L-type Ca²⁺ currents in LC neurons that increase early in life (from P1-P15) in rats. Using fluorescence imaging microscopy, we showed that these Ca²⁺ currents lead to a rise in cellular Ca²⁺. This increased Ca²⁺ could lead to activation of LC neuron K⁺ channels from P1-P15, resulting in neuronal hyperpolarization and a decreased magnitude of the firing rate response to hypercapnia with age. Consistent with this hypothesis, the K⁺ channel inhibitor paxilline enhanced the firing rate response of LC neurons to hypercapnia in an age-dependent manner. Further, the magnitude of the firing rate response of LC neurons to hypercapnia (determined as the Chemosensitivity Index) decreased with age from P1-P15 in parallel with the increase in the CO₂-activated Ca²⁺ channel activity. We are studying the development of Ca²⁺ and K⁺ channels in LC neurons using voltage clamp and immunohistochemical techniques. We propose a novel role for Ca²⁺ in LC neurons, activating a “brake” pathway that can lead to decreased central respiratory gain. Abnormalities of this pathway could result in breathing disorders. [NIH R01 HL56683, AHA Great Rivers Affiliate Predoctoral Fellowship]

Montgomery County Breast Cancer Study - Demographic analysis of breast cancer in Montgomery County, Ohio
Danial Jilani, MPH, Sylvia Ellison, M.A., Sara Paton, Ph.D.

Presenting Author: Danial Jilani
Poster Number: 13

Background: Disparities exist in cancer incidence and mortality between specific population groups
in the United States. Breast cancer is the second most common form of cancer diagnosed in women. Breast cancer ranks as the second highest leading cause of death for women in the state of Ohio and in the United States. Perhaps more concerning, breast cancer is the leading cause of death for Hispanic women and ranks second for white, black, Asian, and Native American women. Specifically, women of low socioeconomic status (SES) have been shown to have lower rates of survival. **Methods:** A descriptive study of breast cancer primary prevention and early detection factors was conducted on Montgomery County women using acquired data sets and secondary sources of data. In addition, a descriptive analysis of women with breast cancer in Montgomery County was conducted. **Results:** Montgomery County had the highest breast cancer incidence compared to Ohio, the United States, and other Metropolitan counties in Ohio with similar population sizes and demographics. Additionally, Montgomery County had a high percentage of women who were diagnosed at a late stage. Chances of survival decrease as stages progress. Montgomery County has a lower median household income than either Ohio or the United States. It also has a higher percentage of families below the poverty level when compared to Ohio. SES is associated with an increased risk of developing and dying from cancer. Montgomery County has a high percentage of individuals who smoke tobacco and do not get any physical activity. Approximately 80 percent of women with breast cancer in Montgomery County survived. **Discussion:** The SES of women in Montgomery County, the high number of people who use tobacco, below average breast feeding numbers, and high percentage of obese and overweight individuals compounded with a higher percentage of individuals who do not get any exercise contribute to a high rate of breast cancer incidence in Montgomery County. Health disparities exist, but more data needs to be collected to confirm the correlation. African American women face higher mortality rates in Montgomery County than any other race. Interventions for Montgomery County specifically include smoking cessation programs, nutrition programs which address diet and physical activity, increased awareness for breastfeeding, and improved access to screening for minority populations.

**Multimodal Brain Imaging in Schizophrenia**
Monte Buchsbaum, Doug Lehrer, Brian Merrill, Bradley Christian, Cemil Kirbas, Meicheng Chiang, King Wai Chu

**Presenting Author:** Brian Merrill  
**Poster Number:** 11

Schizophrenia is a debilitating psychiatric disorder. Dopamine has long been implicated in the pathogenesis of schizophrenia. The development of high-affinity dopamine ligands has enabled the further exploration of cortical and thalamic structures implicated in schizophrenia by other imaging modalities, but not readily studied with older, low-affinity ligands. We aim to demonstrate that decreased $^{18}$F-Fallypride binding potential in cortical structures results from hyperdopaminergia by examining the correlation between decreased $^{18}$F-Fallypride binding potential and glucose metabolism as measured by FDG uptake. Due to dopamine’s inhibitory effects on glucose metabolism, increased dopamine in the synapse would be associated with reduced FDG uptake.

**Assessing Medical Student Perceptions of Graded vs. Ungraded Group Application Exercises in Team Based Learning**
Adam S Deardorff, Jeremy A Moore, Colleen M McCormick, Paul G Koles, Nicole J Borges

**Presenting Author:** Jeremy A. Moore  
**Poster Number:** 17

**Background:** While graded Individual and Group Readiness Assurance Tests promote advanced preparation, the cornerstone of each TBL module is the Group Application (GAP) exercise. In the 2009-2010 academic year, our school moved from a graded GAP exercise to an ungraded GAP exercise in the MS2 curriculum, eliminating team and individual grades as a motivator for students to actively participate in group problem solving. The current study attempts to determine the impact of graded vs. ungraded GAP exercises on the student TBL experience as well as to identify specific factors that contribute to students preferring graded or ungraded application exercises. **Methods:** With Institutional Review Board approval, the 2009-2010 second year class
(n=86; 96.6% response rate) at a midwestern medical school was administered a 22-item Likert questionnaire, with 3 “write-in” questions. The population selected for study is the first class to participate in a TBL-supplemented preclinical curriculum with graded GAP exercises during year 1 and ungraded GAP exercises during year 2, placing them in a unique position to comment on student experiences in graded vs. ungraded GAP exercises. **Results:** While our descriptive data indicate the perceived effectiveness of GAP exercises in generating knowledge outcomes and developing teamwork skills is mostly independent of grade weight, 82.7% of students polled prefer ungraded GAP exercises with only 6.2% preferring graded. Furthermore, 54% of students perceived that ungraded GAP exercises create a lower-stress learning environment, in which they are more apt to listen to classmates and participate in discussion. Correspondingly, greater than 50% of those students preferring ungraded GAP exercises perceive an improvement in the quality of inter-team discussion with ungraded GAP exercises. **Conclusions:** Medical students perceive reduced stress and improved quality of group discussion without sacrificing quality of learning or professional development when GAP exercises are ungraded.

**Surgical Placement of a Spiral Cuff Neuroelectrode to Achieve Pain Reduction**
Telisha Ortiz, Sara Chinnappan, Cole Budinsky, Dr. Amol Soin, MD, MBA

*Presenting Author:* Telisha Ortiz  
*Poster Number:* 25

Unwanted or uncoordinated generation of nerve impulses is a major disabling factor in many chronic pain conditions. If these impulses could be intercepted or blocked utilizing high frequency alternating current (HFAC) along the peripheral nerves, then the disabling condition could be reduced or eliminated. Delivery of HFAC requires surgical implantation of an insulated nerve cuff electrode (or lead) upon the targeted peripheral nerve.

Patients who suffer from pain originating from a neuroma after amputation of the lower extremity were selected as candidates for spiral cuff implantation to administer peripheral nerve stimulation. Initially, prior to lead implantation, patients are screened by undergoing at least two diagnostic peripheral nerve blocks using 0.2% Ropivacaine near the suspected peripheral nerve that is the pain generator proximal to the Neuroma. After two successful nerve blocks, the patient is determined to be a good candidate for spiral cuff electrode implantation. The site of peripheral spiral cuff electrode implantation is in the popliteal fossa at the junction of the sciatic, peroneal and tibial nerve clusters. After general anesthesia is administered, the patient is placed prone on the operating room table and a small 1.5 inch incision is made on the posterior aspect of the patient’s lower extremity in the popliteal fossa. The spiral cuff was inserted a few centimeters distal to the nerve junction. The lead was then tunneled under the skin to exit proximal to the incision. The incision was closed and the proximal end of the lead was attached to the external pulse generator to administer the high frequency alternating current.

Clinical application of HFAC nerve block is dependent upon successful surgical implantation of a nerve cuff electrode. Further studies are warranted to determine the effectiveness and utility of HFAC in humans. The clinical application and potential for HFAC include the ability to produce a reliable, gradable, and reversible nerve block to treat several chronic pain states such as such as residual limb pain, neuroma pain, chronic post surgical pain, and chronic neuropathic pain states.

**Epistaxis in the Setting of Alcoholism: Is Patient Education a Lost Art?**
Perry S. Poteet, MS III, Charlie Abraham, M.D.

*Presenting Author:* Perry S. Poteet  
*Poster Number:* 28

**Introduction:** Alcoholism is an endemic condition in the United States with up to 12% of the population meeting criteria for alcohol dependence. While many of the physical complications of alcoholism are well known, less commonly considered are the effects of alcohol on platelets. Both acute and chronic alcohol abuse can manifest as significant thrombocytopenia and may lead to alterations in thrombokinetics. Physicians often fail to provide even brief
educational interventions for patients with alcoholism in both the primary care and inpatient settings. Numerous studies have shown that such brief interventions can result in significant reduction in alcohol intake while remaining cost-effective. **Case:** We present the case of a 38 year-old male with a known history of alcoholism for seven years who presented to the emergency department twice in one day for bilateral epistaxis. Both bleeds were difficult to control and required placement of RhinoRockets® to achieve hemostasis. On second presentation, a further evaluation was performed which demonstrated thrombocytopenia of 19,000 platelets, a slightly elevated PT/INR of 13.4/1.3, and a normal albumin of 4. Upon obtaining further history, the patient revealed multiple episodes of spontaneous non-traumatic epistaxis over the past two years. He reported to have undergone previous work-up for low platelets with a bone marrow biopsy in August 2010 that showed no leukemia, aplastic anemia, or bone marrow disorder. He was admitted and transfused with platelets which increased his platelet count to 43,000 and subsequently remained stable. His hospital stay was prolonged and complicated by delirium that resulted in traumatic, recurrent epistaxis. With further investigation, it was determined that the patient was never educated on the risk of bleeding as to be caused by his alcoholism during any of his previous episodes of epistaxis. The patient was provided with extensive education and advice regarding alcohol abuse and risk of recurrent epistaxis and was discharged to follow up as an outpatient with primary care physician. **Discussion:** Both alcoholism and epistaxis are common presenting problems for patients within our community. Often not considered is the risk of bleeding in alcoholic patients with retained hepatic function occurring from alcohol-induced suppression of platelet production. Factors associated with failure of physicians to educate alcoholic patients include doubts regarding the efficacy of treatment and past experiences with alcoholic patients. It has been widely accepted that brief education to patients with alcohol dependence by physicians in both outpatient and inpatient settings can have a significant impact on future cessation of alcohol use and cost-benefit to the healthcare system. Moreover, increasing physician awareness of such benefit may improve their consistency in providing a much-needed service to their patients. In our case, the patient was highly receptive to our counseling and advice. Had this intervention been carried out at previous encounters, the complication of the current hospitalization could have been prevented. Physicians are encouraged to consider counseling as an integral part of treatment of any alcoholic patient irrespective of previous encounters.

**Availability and Accessibility of Professionalism Codes at US Medical Schools**

Micah Prochaska, Karen Hauer, Katherine Chretien, Shalini Reddy

**Presenting Author:** Micah Prochaska

**Poster Number:** 15

**Background:** The LCME requires that medical schools develop standards of professionalism for medical students. It is unknown how many medical schools have documents which describe expectations for professional conduct. To date, there have been no systematic reviews of professionalism standards at LCME accredited US medical schools. **Objectives:** This study seeks to quantify the number of schools who have written professionalism standards for medical students, the ease with which these standards can be found, and the descriptive titles of these standards used by medical schools. **Methods:** Using the 2009 directory of 127 LCME accredited US medical schools, we searched for standards pertaining to medical student professionalism at each school. Schools were counted as having professionalism standards if they had any document or statement that outlined expectations for medical student professional behavior. The search was conducted using three publicly available search engines (Google, Yahoo, Bing). The search terms were the official name of the medical school and the word professionalism. If a link to the school’s professionalism guidelines appeared in one of the first five returned search results in any of the search engines, the document was recorded as accessible through a public Internet search. We repeated this strategy with the same search phrase using the search box on each medical school’s homepage. A third accessibility criterion was whether or not the professionalism standards could be found by starting at the medical school homepage.
homepage and navigating through linked pages. The titles of each document were recorded for a qualitative description of the documents. Results: Of the 127 medical schools, 102 schools had a document with expected professionalism standards (80%). 36 were found and accessible using all three search strategies (public search engines, the search box on the medical school website, and page by page navigation of the medical school’s website). 16 were not found using public search engines and were only found utilizing the search box and page by page navigation of the medical school’s website. 50 documents were only found by page by page navigation through medical school homepage. 102 of these documents were publicly available (i.e. not on the medical school’s intranet). Professionalism, conduct, and honor were the three most frequently used descriptive words in the title of these documents, but there was wide variation in the titles used. Conclusions: The majority of LCME accredited US medical schools have statements pertaining to professional behaviors in medical students. Thus, the majority of US medical schools are in compliance with LCME guidelines. While most statements are publicly available, they are difficult to find using standard search strategies. The difficulty in finding these statements using standard search strategies suggests variable degrees of accessibility and, perhaps, utilization of these codes within medical schools. Additionally, the variation in titles of these documents suggests there is little standardization of professionalism guidelines or how they are taught. Future directions include qualitatively analyzing the content of these codes to determine common themes and to determine how these codes were developed and utilized.

Abnormal Placental Findings Associated with Non-Reassuring Fetal Monitoring and Excellent Neonatal Outcomes
Gary Ventolini MD, Shanthi Ramesh BA, Ran Neiger MD, Sheela Barhan MD

Presenting Author: Shanthi Ramesh
Poster Number: 12

Objective: Obstetricians, Neonatologists, and Pathologists have studied gross histological analysis of human placentas in search of specific alterations in placental function that can be correlated with neonatal outcomes. Our study assessed the prevalence of abnormal placental findings associated with non-reassuring fetal monitoring in labor requiring emergent instrumental or cesarean delivery, followed by excellent neonatal outcome. Study Design: One hundred consecutive emergency deliveries, instrumental or cesarean, performed due to non-reassuring fetal monitoring while in labor were retrospectively evaluated. All patients were low-risk for obstetric complications, and had a singleton, term pregnancy. They had a normal antenatal routine testing and a normal anatomy ultrasound scan at 20 to 22 weeks gestation. Results: There were 35 placentas (35%) with gross placental anomalies at the delivery triage. Additionally 7 placentas (7%) were reported to be abnormal at pathology examination. Gross placental anomalies included opaque or foul smelling amniotic membranes, velamentous cord insertion, long or short umbilical cord, acute abruption, and retro placental hemorrhage. Placental anomalies found at pathology exam included chorioamnionitis, funisitis, and true knots. Conclusion: The prevalence of abnormal placental findings in our studied population was 42%.

Building the Pyramid: Measuring Cognitive Outcomes in a Pre-Clinical Bioethics Course
Ashley K. Fernandes, MD, PhD; Heather V. Rodabaugh, DMA

Presenting Author: Heather Rodabaugh
Poster Number: 14

Background: Medical schools universally accept the idea that bioethics courses are essential components of education, but few studies which measure outcomes (i.e., knowledge or retention) have demonstrated their educational value in the literature. Objective: This study examined whether core concepts of a pre-clinical bioethics course were learned and retained. Over the course of two years, a pre-test comprising 25 multiple-choice questions was administered to two classes of students prior to the start of a 15-week ethics course, and a post-test was administered at the end of the course. Ninety-seven students were in the first class, 92 were in the second; there were a total of 188 subjects. Results: Analysis using
paired t-tests showed a significant difference between pre-test scores and post-test scores. The pre- and post- test results also suggested a shift in difficulty level of the questions, with students finding identical questions easier after the intervention. **Conclusion:** Given the increase in post-test scores after the 15-week intervention, the study suggests that core concepts in medical ethics were learned and retained. These results demonstrate that an introductory bioethics course can improve short-term outcomes in knowledge and comprehension. The study begins to answer the question of whether a bioethics course makes a difference in students’ technical knowledge.

**Creation of a Sacral Nerve Root Strip Lesion by Thermal Radiofrequency Ablation as a Novel Treatment for Chronic Sacroiliitis Pain**

Stephen Sams, Christo Frangopolous, Cole Budinsky, and Amol Soin M.D., M.B.A.

**Presenting Author:** Stephen Sams  
**Poster Number:** 22

**Introduction:** Sacroiliitis is a common cause of chronic low back pain. The sacroiliac (SI) joint is often injured in falls, heavy lifting or twisting, or direct trauma to the sacral region, and is prone to degenerative arthritis. Current treatment options include physical therapy, anti-inflammatory and analgesic medications, injections of local anesthetic into the joint, and chiropractic manipulation. Often, the pain is refractory to these treatment modalities. A novel treatment providing more sustained pain relief is described. In this method, thermal radiofrequency ablation (RFA) is delivered to the sensory neurons of the sacral nerve roots that innervate the SI joint ($S_{1-4}$). This treatment is thought to provide durable pain relief by ablating or producing lesions in these sensory nerves. **Methods:** A 37-year old Caucasian woman presented with signs and symptoms consistent with left-sided sacroiliitis. She had failed all treatment modalities with the exception of a local anesthetic block near the sacral nerve roots, which alleviated the pain temporarily. This suggested the use of RFA to these same nerve roots in an effort to obtain sustained pain relief. Traditional RFA utilizes a 20- or 22-gauge needle to create small lesions distal to the tip of the needle. With numerous small branches of nerve fibers coming off the larger nerve trunks, traditional RFA is impractical, as it would require placing 15 or more needles into the patient. We therefore used a single probe containing multiple electrodes which could be placed parallel to the patient’s sacrum to create a strip lesion across the $S_{1-4}$ nerve roots. (See poster diagrams for both fluoroscopic images of the probe, and patient pictures). A test current of 2 milliamps at 2 Hz was first applied to the electrodes to confirm the absence of contact with any motor fibers. If no parasacral muscle twitching was noted, sensory testing was then carried out by delivering 50 milliamps at 0.5 Hz, which reproduced her pain. Upon this confirmation of appropriate probe placement, RFA lesion creation was carried out at 80 °C for 90 seconds per site. She was discharged home without complication. **Conclusions:** The patient was seen in follow up at 2 weeks, and at 3 months. She reported an 84% reduction in sacroiliac and lower back pain. She denied motor weakness or excessive numbness, and reported an increase in functional status scores. Additional patient trials are planned, but this case report demonstrates the feasibility of creating a sacral nerve root strip lesion by RFA as a safe, effective, durable, and minimally invasive treatment of refractory sacroiliac joint pain.

**Differences in Oxygen Consumption Rate of Osteoblast Lineage Cells in Rats Bred for High and Low Aerobic Capacity**


**Presenting Author:** Riyad J. Tayim  
**Poster Number:** 4

Cells of the osteoblast lineage are particularly responsive and sensitive to their local oxygen environment, and their ability to improve their intracellular aerobic metabolism in response to exercise may have important downstream effects on bone cell function and skeletal phenotype. In this study, we tested the influence of inherent aerobic capacity on bone metabolism independent of applied mechanical loading. Using the Koch-Britton selective breeding rat model of high capacity (HCR) and low capacity (LCR) runners, an intrinsic 5-to-7 fold functional genomic
A difference in aerobic exercise capacity exists between non-trained animals after 20 generations of selection. HCR have consistently demonstrated heightened skeletal mineralization and osteoblast activity correlated with their inherent aerobic capacity. In the present study, we compared cellular oxygen metabolism between HCR and LCR osteoblast lineage cells during osteoblast differentiation in vitro. Bone marrow stromal cells (BMSCs) were harvested from the femora and tibiae of 8.5 month, female, generation 25 rats ($N=3$), and were cultured under standard conditions for 12 days followed by osteoblast differentiation. The Seahorse Bioscience XF24 Analyzer was used to assess cellular aerobic capacity on Day 0, 3, 7, 10, 14, 21, and 28 of the differentiation time course. Basal respiration and glycolysis were assessed and normalized to cell number through time-resolved measures of oxygen consumption rate (OCR) and extracellular acidification rate (ECAR). OCR and OCR/ECAR ratios in both HCR and LCR cells suggested less glycolytic and more aerobic cell metabolism with differentiation and matrix production followed by a return to glycolysis as cells became engulfed in their ECM. HCR cells consumed less oxygen per cell than LCR through Day 14, suggesting a more efficient phenotype. With the addition of oligomycin, HCR cells showed an increase in percent oxygen consumed for ATP production at Day 14 vs. LCR, but this pattern was reversed by Day 28. The HCR/LCR selective breeding rat model allows us to investigate how intrinsic differences in aerobic metabolism result in differences in cellular aerobic metabolism within osteoblast lineage cells. Thus we are able to define cellular parameters that may be responsible for the heightened mineralization and osteoblast activity found in these animals.

**Increased Plasma Adiponectin and Decreased Adiposity in Angiotensin II Receptor Type 1a (AT1a) Knockout Mice**

**Nathan M Weir, Mariana Morris, Khalid M Elased**

**Presenting Author:** Nathan M. Weir  
**Poster Number:** 1

Several clinical trials have found certain angiotensin receptor blockers (ARBs) exhibit benefits such as improving insulin sensitivity in type 2 diabetics. Adiponectin plays a significant role in glucose metabolism and insulin sensitivity, exhibits antiinflammatory and antiatherogenic properties. Low levels are associated with obesity-related chronic disease such as type 2 diabetes. Traditionally, thiazolidinediones (TZDs) targeting PPAR-γ activation have been used to boost adiponectin levels and improving type II diabetes. We aim to study the effects of angiotensin II (Ang II) and the AT1a receptor on adiponectin in mice. Epididymal fat and plasma were collected from AT1a knockout mice ($\text{Agtr1atm1Unc/J}$) at 24 weeks of age. Eight week old C57BL/6 male mice were infused with Ang II (1000 ng/kg/h) for 4 weeks via osmotic pump. Control mice were age matched and infused with saline for the same duration. At 12 weeks of age, mice were sacrificed and plasma analyzed. Plasma of Ang II infused mice revealed decreased adiponectin, increased cholesterol and triglycerides compared with saline infused controls (saline vs. Ang II; $p=0.042$, $p=0.024$, $p=0.0032$, respectively). The prolonged high dose of Ang II did not have a cachectic effect and the change in adiponectin was independent of body weight (saline vs. Ang II; $p=0.342$). Conversely, AT1a knockout mice are known to have innately increased circulating Ang II levels due to lack of negative feedback from AT1a mutation, yet we found plasma adiponectin was actually elevated in this group (control vs. AT1a KO; $p=0.010$). Increased adiponectin in AT1a KO mice was associated with several improved metabolic parameters. Total body fat and percent body fat were significantly reduced in AT1a KO mice as determined by NMR spectroscopy (control vs. AT1a KO; $p=0.034$, $p=0.016$, respectively). Decreased adiposity was supported by reduced corpuscular area in isolated epididymal adipocytes (control vs. AT1a KO; $p<0.001$). Fed blood glucose levels also improved in AT1a KO mice (control vs. AT1a KO; $p=0.004$). Results showed blockade of the AT1a receptor successfully increased plasma adiponectin while improving blood glucose and adiposity in mice. This study illustrates a cross talk between the renin angiotensin system and adiponectin.
Assessing the palliative care needs of acute stroke patients
Ashleigh Welko, Steven Radwany MD, Teresa Albanese PhD

Presenting Author: Ashleigh Welko
Poster Number: 10

While palliative care needs for acute stroke patients are not well-defined in the literature, these patients have comprised 7% of Summa’s palliative care consults made since the inception of its Acute Palliative Care Unit. Through the course of this retrospective study, the medical and administrative records of 767 acute stroke patients were analyzed to determine the reasons for palliative care referral as well as the outcomes for each patient. It was found that palliative care referrals by physicians were used primarily to smooth the transition, for both the patient and the family, from acute curative efforts to end-of-life care. The data also indicates that the inception of the APCU has provided access to palliative care resources to a greater number of acute stroke patients and their families, assisting them in making effective discharge and/or end-of-life care decisions. Overall, the data gathered in this study indicate that while acute stroke patients are not generally perceived as a population for which palliative care referrals are generally made, palliative care is integral to the complete care and decision-making of these patients and their families.

Gastro-intestinal bacteria in relation to Childhood Obesity
Kenche, Harshavadran; Stolfi, Adrienne; Michail, Sonia; Yang, Thomas

Presenting Author: Thomas Yang
Poster Number: 3

Background: Childhood is becoming a new epidemic in the U.S. Obesity related diseases are appearing in the pediatric population. Amongst them, Non-alcoholic fatty-liver disease (NAFLD) is one of the most liver-endangering ones. If untreated, NAFLD can develop into Non-alcoholic steatohepatitis (NASH) of the liver. A better understanding of the dynamic relationship between gut bacteria and NAFLD would better detection and management of NAFLD. Objective and Design: The goal of this study is to utilize microarray of fecal samples to compare the abundance and bacteria population of two patient groups: Healthy children and obesity children with NAFLD. Results: Children with NAFLD had an overall increase in overall gut microbiome amount especially in actinobacteria, Lentisphaerae, Erysipelotrichi and proteobacteria. The Actinobacteria, Lentisphaerae and proteobacteria population percentage were significantly increased in NAFLD patients, while there was a decrease in Clostridia population percentage. Conclusion: Various quantitative differences and shifts in bacterium population amongst the two patient groups demonstrate that gut microbiome plays a significant role in relation to NAFLD. A better understanding of the gut microbiome will help us develop methods to intervene and monitor the progression of NAFLD.

Discussion: A shift in actinobacteria population goes along the same lines of a previous study tying high amounts of Actinobacteria to obese adolescents. Also, adolescents who had a decrease in Actinobacteria experienced significant weight loss amongst obese adolescents who underwent a weight loss program. Actinobacteria, regardless of having anti-inflammatory properties, has been linked with adolescent obesity in some studies. Previous studies on obese adolescents suggest that children who underwent significant weight loss (>6kg) have decreased levels of Bifidobacteria. Such studies and our data suggest that a balanced population of Actinobacteria is vital for patient’s health, and is directly influenced by the patient’s dietary habits and caloric intake. Maybe Actinobacteria thrive in inflammatory conditions, such as the gut environments of NAFLD. In contrast, Actinobacteria decreases when the patient is less obese-since the gut environment is less inflamed. Proteobacteria is proportionate to plasma glucose levels and is linked to type-2 diabetes, such bacterium is increased in NAFLD patients. Obesity has been linked with an increase of firmicutes. Overall, NAFLD patients have a increased population percentage and increased amount of firmicutes. However, it is interesting how the Clostridia class is decreased in NAFLD patients. This suggests that there might be beneficial types of firmicutes that are decreased in obese patients.
Brain Death Determination: A Paradigm for Documentation and Standardization
Jessica A Zagory, Cathryn Chadwick MD, Harry L Anderson III MD

Presenting Author: Jessica Zagory
Poster Number: 8

Background: Determination of brain death is a complex process that requires adequate physician education and meticulous documentation. The literature suggests that these are lacking on a national level. Though literature and policy are abundant on the subject of brain death, there is very little definitive data which determines a single standard of care for determining brain death. In addition, Ohio Law gives little definitive guidance on this topic, merely stating that brain death must be determined in accordance with accepted medical standards. Methods: A retrospective chart review of patients evaluated for brain death in the ICU of Miami Valley Hospital over 2 similar 6-month periods, before and after implementation of the paradigm, was conducted to evaluate specific documentation points using a worksheet. During the first 6-month period, all ICU deaths were extracted using ICD discharge codes. In addition, charts of all patients who underwent brain flow studies during this time were also obtained to best capture all patients who underwent determination of brain death. A chart review worksheet was used in evaluating physician’s progress notes to assess whether documentation met specific standards. The clinical examination, apnea test, and confirmatory test documentation was reviewed. In addition, the etiology and irreversibility of the condition was documented. Finally, the presence of documentation of the time and date of death was also studied. This study was conducted under the auspices of and approval by the Institutional Review Board of Miami Valley Hospital.

Results: Thirty-nine charts were abstracted during the second 6-month period, and thirty-eight (97%) were satisfactory for inclusion in this part of the study. The paradigm was used in 13 of the 38 reviewed charts (34% utilization). Overall, an attending clinical examination was not present in 16% of the patients. A second clinical examination was not performed in 34% of the patients. All patients (100%) had time of death documented.

Conclusions: Determination of brain death in hospitalized patients is an exquisitely complex and important part of care in the intensive care unit, as the results of the determination lead to certain steps in care which have finality. Our primary hypothesis was that determination of brain death using existing procedures and documentation (without a guide or paradigm) was suboptimal, and might not meet the threshold of the requirements of the Ohio Revised Code, or even the current and accepted standard of care. While the paradigm was not used by all practitioners, there was a measurable improvement in documentation of the physical examination which is necessary for pronouncement when the paradigm was used. We feel that such algorithmic methodology consistently employed during the determination of brain death might help to fully cover the elements needed to support this complex process, and standardize it. Correct documentation in the medical record will also optimize later review and data collection. We are continuing to review study data to employ the lessons learned.

Melanoma Pathology Reporting in the Community: Does Template Reporting Lead to Better Communication?
Jessica A Zagory, Minia Hellan

Presenting Author: Jessica Zagory
Poster Number: 9

Background: The pathology report is a key element in developing a treatment plan for patients with melanoma. The National Comprehensive Cancer Network (NCCN) guidelines identify 6 “minimal elements” to be reported. The purpose of this study is to assess the frequency with which these elements are reported in a community setting. Methods: We conducted a retrospective chart review from January 2008 – July 2010 for all patients referred to a surgical oncology practice for treatment of melanoma. Pathology reports were assessed for reporting of: Breslow thickness, ulceration, Clark level, mitotic rate, margin status and satellitosis. A Chi-squared test was used to evaluate for statistical significance between labs utilizing templates and those that did not.

Results: One hundred eighty one charts met inclusion criteria. Reports were received from 13 labs, with 7 utilizing a reporting template.
Overall, location of lesion was reported most consistently at 99.4%, followed by Breslow thickness (96.6%), Clark’s level (86.0%), tumor infiltrating lymphocytes (69.8%), ulceration (69.3%), peripheral margins (69.8%), and deep margins (64.8%). Labs utilizing a reporting template were more likely to report ulceration (p<0.0001), peripheral margins (p=0.0018), deep margins (p=0.0009), mitotic index (p=0.0032), and Clark level (p=0.0119). **Conclusions:** Despite recommendations from the NCCN and implementation of templates as provided by the College of American Pathologists and the Commission on Cancer, basic pathologic elements for melanoma are not included in the final report in the community practice setting. This is consistent with reviews across Europe and Australia. As staging and indications for sentinel lymph node biopsy continue to evolve, communication between the pathologist and surgeon to optimally guide clinical decision-making need further improvements.

**Introducing the Delayed Retinoid Burn**
Kristine Busse Zitelli, John YM Koo

*Presenting Author: Kristine Busse Zitelli  
Poster Number: 18*

Combination oral Retinoids and Phototherapy, including NB-UVB and PUVA, is highly effective in Psoriasis. However, there is a unique risk for *phototoxicity* when a systemic retinoid is added to an already-maximized phototherapy dosimetry. We introduce the term, Delayed Retinoid Burn, to describe this phenomenon and illustrate its utility with a clinical case report.
1. Increased Plasma Adiponectin and Decreased Adiposity in Angiotensin II Receptor Type 1a (AT1a) Knockout Mice - Nathan M Weir, Mariana Morris, Khalid M Elased

2. Ca\textsuperscript{2+} -activated K\textsuperscript{+} channels limit the chemosensitive response of locus coeruleus (LC) neurons - Ann N Imber and Robert W Putnam

3. Gastro-intestinal bacteria in relation to Childhood Obesity - Kenche, Harshavadran; Stolfi, Adrienne; Michail, Sonia; Yang, Thomas


5. Semitendinosus Muscle Fatty Infiltration Following Tendon Resection in Rabbits - Vourazeris JD, Lawless MW, Markert R, Burleson AP, Boivin GP

6. Epidemiology of Cervical Fractures in Adults aged 18-44 - Matthew Binkley, Nicolas Grisoni MD, Richard Laughlin MD, Peter Ekeh MD, Andrew Burleson

7. Assessment and Management of Adult Obesity in a Primary Care Practice - Sherry Adkins, Marietta Orlowski, PhD, Sylvia Ellison, MA

8. Brain Death Determination: A Paradigm for Documentation and Standardization - Jessica A Zagory, Cathryn Chadwick MD, Harry L Anderson III MD


10. Assessing the palliative care needs of acute stroke patients - Ashleigh Welko, Steven Radwany MD, Teresa Albanese PhD

11. Multimodal Brain Imaging in Schizophrenia – Monte Buchsbaum, Doug Lehrer, Brian Merrill, Bradley Christian, Cemil Kirbas, Meicheng Chiang, King Wai Chu

12. Abnormal Placental Findings Associated with Non-Reassuring Fetal Monitoring and Excellent Neonatal Outcomes - Gary Ventolini MD, Shanthi Ramesh BA, Ran Neiger MD, Sheela Barhan MD


14. Building the Pyramid: Measuring Cognitive Outcomes in a Pre-Clinical Bioethics Course - Ashley K. Fernandes, MD, PhD; Heather V. Rodabaugh, DMA

15. Availability and Accessibility of Professionalism Codes at US Medical Schools - Micah Prochaska, Karen Hauer, Katherine Chretien, Shalini Reddy
16. The Hidden Curriculum: What are psychiatry clerkship students really learning? - Joy Chang; Nicole Borges, PhD; Brenda Roman, MD

17. Assessing Medical Student Perceptions of Graded vs. Ungraded Group Application Exercises in Team Based Learning™ - Adam S Deardorff, Jeremy A Moore, Colleen M McCormick, Paul G Koles, Nicole J Borges

18. Introducing the Delayed Retinoid Burn - Kristine Busse Zitelli, John YM Koo

19. Fluoroscopically Guided Minimally Invasive Lumbar Decompression to Treat Spinal Stenosis - Bryan Hill, Amol Soin, MD, MBA, Cole Budinsky, Simon Choi, Sara Chinnappan, Telisha Ortiz, Christo Frangopolous

20. Intrathecal Bupivacaine and Ziconotide via a Patient Therapy Manager as a Non-Opioid Based Treatment for Chronic Pain - Christo Frangopoulous, Stephen Sams, Cole Budinsky, Amol Soin MD, MBA


24. An Expanded Study Comparing Spinal Cord Stimulation Sensations Using an Observational Mechanical Gateway - Sara Chinnappan, Telisha Ortiz, Cole Budinsky, Dr. Amol Soin, MD, MBA

25. Surgical Placement of a Spiral Cuff Neuroelectrode to Achieve Pain Reduction - Telisha Ortiz, Sara Chinnappan, Cole Budinsky, Dr. Amol Soin, MD, MBA


27. Translucent blue facial papule on an 89 year old man - Thomas J. Hagele, BS; Charles Chiang, MD; Rocco Serrao, MD; Julian J. Trevino, MD

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