

University of Dayton & Miami Valley Hospital
Seventh Annual Healthcare Symposium
Poster Session Abstracts
April 23, 2016

Category: Biomedical Research

BMR-1

Author(s): Sarah Byrne, Ankita Sarkar

Title: *Effects of Ultrasound on Amyloid Beta 42 (A β 42) Mediated Neurodegeneration*

Alzheimer's disease (AD) is a neurodegenerative disease progressing with age. The exact mechanisms that lead to cell death are not entirely understood, our hypothesis of the cause of degeneration is that the amyloid-beta-42 (A β 42) plaques are generated from mis-cleavage of the amino acids, forming aggregates. This is due to the hydrophobic nature of the extra two amino acids added to the typical and naturally occurring A β 40 in the body. This addition triggers cell neuronal death because of the toxicity and stress that plaques place on the neurons. *Drosophila melanogaster* was used as a model in this study to insert the Alzheimer's gene into the imaginal disc of the eye for expression of the gene. In this experiment, ultrasound was utilized as a possible treatment to Alzheimer's. Ultrasound is a high frequency sound wave. In theory, using energy emitted from these waves would break down the plaques limiting damage due to degeneration. The wild type was used as a control to see any side effects of the ultrasound treatment, while an AD affected fly was used to determine effectiveness of the treatments. The goal of this experiment was to standardize the ultrasound treatment, to observe the effects on survival rates, prevent neurodegeneration by removing or decreasing plaque damage. By varying the height, medium, time, and number of treatments, the survival rate and rescue can be tracked. Further studies using larval imaging approach can be used to see early stage effects of the ultrasound. The results from our studies will be presented.

BMR-2

Author(s): Eric Newton

Title: *Supplementation of propionate inhibits the anaerobic growth of the foodborne pathogen *Listeria monocytogenes**

Listeria monocytogenes is an infectious bacterium that is known to cause severe diseases in people who are pregnant, elderly, or generally immunocompromised through consumption of contaminated food products. To help develop preventative strategies to protect these high-risk individuals, our lab focuses on the approach of enhancing the chemical barrier naturally existing in the intestinal tract to block *L. monocytogenes* from interacting with the human intestinal epithelium and causing fatal infections. The chemical environment inside the human intestinal lumen is rich with fermentation acids produced by the endogenous microbes. In my research project, I tested the efficacy of propionic acid, one of the three major fermentation acids naturally abundant in the human gastrointestinal tract, against the in vitro growth of *L. monocytogenes*. If propionic acid exhibits inhibitory effect on *L. monocytogenes* growth, then it can be further developed into a preventative tool against *L. monocytogenes* infections. To determine the effect of

propionic acid on *L. monocytogenes* growth, I supplemented *L. monocytogenes* cultures with 0, 5, 15, 25mM of sodium propionate and grew the culture either aerobically with continuous agitation for oxygen saturation or anaerobically inside an anaerobic chamber with a 2.5% hydrogen in nitrogen atmosphere. I monitored bacterial growth by measuring culture optical density every hour for 8 hours and calculated bacterial doubling time during the exponential phase of the growth. I observed that under aerobic conditions, propionate supplementations did not cause a significant impact on bacterial doubling time. However, under anaerobic conditions, propionate supplementation at 25mM led to a significantly increased doubling time, a result indicating an inhibitory effect of propionate on growth. These results demonstrate an inhibitory effect of a naturally occurring fermentation acid in the human intestines and therefore highlighted the potential values for propionic acid as a preventative chemical agent against *L. monocytogenes* infections.

BMR-3

Author(s): Kristine Perez, Elizabeth Abrams

Title: *The effects of propionate and oxygen on the intracellular growth of the foodborne pathogen Listeria monocytogenes*

Listeria monocytogenes causes foodborne illnesses in immunocompromised individuals by colonizing the human intestine. During infections, *Listeria* adapts to the intestinal environment, which is low in oxygen but rich in fermentation acids. However, it is unclear how these acids influence *Listeria* pathogenesis under anaerobic conditions. In this study, we investigated the effects of anaerobic exposure to propionate, a major fermentation acid, on *Listeria*. To test the effect of propionate, we used a macrophage cell line as our model host cells and monitored the intracellular growth of *Listeria* after exposure to different levels of propionate under both aerobic and anaerobic conditions. Results showed that while anaerobically grown *Listeria* was compromised during late stages of intracellular growth compared to aerobically grown bacteria, supplementation of propionate at 15mM did not significantly impact intracellular growth. Survival and escape from the acidifying phagosomes is critical during *Listeria* intracellular growth. To test the effects of propionate on *Listeria* survival in acidic conditions, we conducted survival assays with aerobically and anaerobically grown *Listeria* after 1 hour exposure to pH 4, 5, 6, or 7 buffers. Our data showed that *Listeria* was not able to survive in the pH 4 buffer. For anaerobically grown *Listeria*, survival at pH 5 was significantly reduced compared to survival at pH 6 and 7. Propionate supplementations did not cause a significant change in survival. Together, our data suggest that anaerobic exposure, not propionate at 15mM, played an important role in *Listeria* pathogenesis. We plan to continue our investigations with higher levels of propionate. Ultimately, our research will help elucidate the behavior of *Listeria* during the intestinal phase of infections.

BMR -4

Author(s): Matthew Riccetti, Ankita Sarkar

Title: *Role of Steroid Responsive Ecdysone Signaling Pathway in Alzheimer's Disease*

Alzheimer's disease (AD) is a chronic neurodegenerative condition that affects nearly 44 million people worldwide. The hallmark of Alzheimer's pathology is the accumulation of extracellular A β -42 protein plaques generated by defective endoproteolysis of amyloid precursor protein (APP) by α - and γ -secretase. Currently, no proper early detection methods or cures exist for AD, but

promising molecular genetic evidence is arising from studying the development of nervous tissue in model organisms like *Drosophila melanogaster*. In order to better understand the mechanism by which this disease progresses and its interactions among nervous tissue, we misexpressed human A β -42 in the eye of *Drosophila*. This stable transgenic line results in GMR-GAL4 driven UAS-amyloid-beta (GMR>A β 42) mediated cell death in the eyes of nearly 100% flies at 29°C. We identified the Ecdysone signaling pathway as a modifier of neurodegeneration caused by A β -42 accumulation in the eye. Recent research has shown that the Ecdysone (Ecd) signaling pathway modulates Hippo transcriptional activity in imaginal disc cells. The Ecd coactivator Taiman (Tai) forms a unique transcriptional complex with the Hippo transcription factor Yki, suppressing expression of canonical Hippo targets and inducing transcription of germline stem cell factors in regions that have already differentiated. Our preliminary data suggests that upregulation of the Yki-Tai transcription complex constituents leads to germline-like growth of new cells, rescuing A β 42 mediated neurodegeneration in our *Drosophila* eye model. We propose to understand the underlying molecular genetic mechanism responsible for Ecd/Hippo-mediated rescue of A β 42 mediated neurodegeneration to identify a novel protein interaction network for AD therapeutics.

BMR-5

Author(s): Logan Roebke, Kirti Snigdha, Indrayani Waghmare, Madhuri Kango-Singh

Title: *Investigating altered programs of gene regulation during tumorigenesis using *Drosophila* cancer models*

Cell death is the cell's natural defense to stress or other cytotoxic signals. The Hippo pathway regulates organ size, and genes in the Hippo pathway are often mutated in epithelial cancers. The Hippo pathway functions through a gene called Yorkie (yki). Recently, yki was shown to collaborate with other signaling pathways, and regulate subsets of genes by altered mechanisms like co-regulation by forming transcriptional complexes with other transcription co-regulators [e.g., Taiman(tai)]. Thus, these target genes are distinct from yki-regulated genes during normal development. My hypothesis is the following: yki collaborates with tai to regulate cell proliferation and cell death in tumors leading to transformation and tumorigenesis. We have generated simple genetic models in *Drosophila* to test this hypothesis. I will: Aim 1: Test if yki and taiman regulate cell proliferation in *Drosophila* cancer models. I will generate tumors by overexpression of oncogenic ras in scrib-depleted cells, and test if the regulation of cell cycle genes in normal cells and cancer cells depends on both yki and tai function. Aim 2: Test yki and taiman regulate cell death in *drosophila* cancer models. dronc may be regulated by a mechanism that involves relief of repression. We will test if the cell death regulator dronc depends on both yki and tai function in normal or cancer cells. These data will answer if yki and tai collaborate to regulate tumor specific genes. We will then explore the underlying mechanism of this collaboration.

Category: Clinical Medicine

CLM-1

Author(s): Alison Bales, Kevin F. Purcell BS, MS, MPH, Julie Ferraiola MD, Michael J. Prayson MD, Diane M. Kimpel MS, APRN, Ronald J. Markert PhD, Gregory R. Semon DO, A. Peter Ekeh MD FACS, Mary C. McCarthy MD FACS

Title: *Should Extraperitoneal Bladder Injuries Be Repaired at the Time of Pelvic Fixation?*

Introduction: 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 ± 18.3 years, and injury severity scores of 27.1 ± 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 ≥ 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.

CLM-2

Author(s): Omeed Jazayeri-moghaddas, Tse W, Herzing K, Markert R, McCarthy M

Title: *Comparison between Nasotracheal Intubation and Orotracheal Intubation in Patients with Facial Trauma*

Objective: In patients with facial trauma, medical personnel believe that oral intubations have fewer complications than nasal intubations. We report the outcomes of a Level 1 trauma center in Dayton, Ohio. **Methods:** This retrospective study compares oral intubation versus nasal intubation with data acquired from the Miami Valley Care Flight Database and the trauma registry from 2007-2013. Data were analyzed with the Mann-Whitney Test, Fisher's Exact Test, and chi square test. **Results:** From a total of 212 patients with facial trauma, 77 patients were nasally intubated and 135 were orally intubated. The oral group was older (41.1 ± 17.6 vs. 35.1 ± 14.7 years, $p=0.02$) and had a higher Abbreviated Injury Scale (AIS) mean score for face (1.76 ± 0.59 vs. 1.36 ± 0.48 , $p < 0.001$). The two groups did not differ in mortality (nasal 23.4% vs. oral 17.8%, $p=0.33$), length of stay (LOS) in the ICU (nasal 7.5 ± 9.1 vs. oral 7.4 ± 8.0 , $p=0.73$), or total LOS (nasal 13.3 ± 14.3 vs. oral 13.4 ± 14.1 , $p=0.67$). Nor did the two groups differ on the complications of sinusitis, pneumonia, arrhythmia, deep vein thrombosis (DVT), urinary tract infection, cardiac arrest, atelectasis, and respiratory

failure. However, nasally intubated patients were more likely to have any complication (44.2% vs. 28.1%, $p=0.018$) and nearly three times more likely to be intubated < 24h (26.0% vs. 8.9%, $p=0.003$). Conclusions: Due to the minimal differences in complications, nasal intubation may be a viable alternative to oral intubation in patients with facial trauma.

CLM-3

Author(s): Molly Osterhage, Casey T Walk, Malvika Sharma, Jeffrey Pence MD

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

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 extractor has shown efficacy in the literature for the adult population, but not the pediatric population. We present a 15 year old male with a spherical shaped rectal foreign body that was safely and efficiently treated with an obstetric vacuum extractor.

CLM-4

Author(s): Malvika Sharma, Casey T Walk, Molly Osterhage, Rouzbeh R Ahmadian MD, Joshua Pringle MD, Arturo Aranda MD, Jeffrey Pence MD, David Meagher MD

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

Pheochromocytomas and Paragangliomas (PHE/PGL) are exceedingly rare neuroendocrine tumors that are found along the sympathetic chain in the neck, chest or abdomen. 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.

CLM-5

Author(s): Melanie Stall, Dr. Mukund Dole, Dr. Ayman El-Sheikh

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

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 the age of 4 years. Design/Method: Literature review and case report. Results: 3 year old female presented with pallor, abdominal distension, decreased appetite, easy bruising, cervical lymphadenopathy, and massive hepatosplenomegaly. With bone marrow studies revealing 17% blasts, and FISH and PCR showing $t(9;22)(q34;q11.2)$

consistent with the classical BCR/ABL fusion, the patient was diagnosed with CML in accelerated phase. Dasatinib 80mg/m² in a single daily dose was initiated. After 4 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 5.01% Bcr-Abl fusion transcripts. She continues Dasatinib and is being evaluated for a matched unrelated allogeneic stem cell transplant. Conclusion: Given the rarity of pediatric CML in accelerated phase, treatment recommendations are not well defined. 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 is warranted in such cases.

CLM-6

Author(s): Casey Walk, Kyra A Dawson DO, Maxfield D Richardson DO, Malvika Sharma, Arturo Aranda MD, Jeffrey C Pence MD, David Meagher MD

Title: *Right sided diaphragmatic injury in children: a case study and literature review*

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. 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. A review of the literature regarding traumatic diaphragmatic hernias in the pediatric population will accompany this presentation.

Category: Community Health

CMH-1

Author(s): Casey Chanatry, Joseph Greiner

Title: *Being a Good Neighbor*

Experiencing the environment of Good Neighbor House Dental Clinic in downtown Dayton was eye-opening involving a caring staff and grateful patients. This non-profit establishment focuses on dental care for uninsured patients and needs their name heard by the public, in order to continue to increase their impact on the local community. Creating a program to get people to speak on their behalf could result in a great opportunity to expand and gain more resources. If supporters of Good Neighbor, such as DIG and current staff, were able to go around to high schools and colleges and speak to the students, the turnout of volunteers and donations could skyrocket, which would greatly benefit the clinic, and the patients who attend there. After the first experience at Good Neighbor, we felt inspired by the staff and their willingness to help any person in need causing us to return weekly to volunteer and shadow the Dentists. The experiences here opened our eyes and made us see how grateful the less fortunate are for something as small as getting their teeth cleaned. If students had knowledge of Good Neighbor, the turnout of volunteers would increase. Overall, these experiences have solidified our choice to pursue the career of dentistry and the possibility to help those in need and we hope through this, we can influence others and inspire them to help, or possibly take on a career like this of their own.

CMH-2

Author(s): Dominick Massa

Title: *Consistency and Cleanliness: The Best Approach to a Healthy Smile*

After working at Good Neighbor House, a dental clinic for people with low-income and without insurance, I noticed that many facets involving education of dental healthcare are lacking. Most important is the emphasis on consistent maintenance of oral health. Over the months I worked there, I recognized that the low-income community has a reactionary relationship to oral health. Patients mostly tended to their teeth once pain or infection became a problem instead of maintaining good habits over many years. I think that Good Neighbor House needs to adopt both a generalized and personalized plan for each of their patients to increase consistency. A brochure/pamphlet should be given to the patient that clearly emphasizes the necessity of maintaining oral health by pointing towards the successful route to healthy teeth and showing signs of worsening oral health and the potential risks. Included in this may be a short description of the costs of a consistent and reactionary relationship to the dentist. Also, there needs to be a personalized message that is sent to every patient telling them why they need to return and what is next in their treatment plan to remind them of the importance of their appointment. I think that these two things will ultimately lead to patient retention and consistency, which will result in better dental healthcare for more people.

CMH-3

Author(s): Austin Mullins

Title: *The Reach Out of Montgomery County Pharmacy*

Reach Out is a free healthcare clinic that provides general healthcare services to uninsured or underinsured citizens of Montgomery County. They not only provide healthcare services, but they provide a pharmacy with prescription medications that the patients need. The pharmacy can fill prescriptions that are not controlled substances; along with consulting patients about the medications they will be taking. The Pharmacy operates like a retail pharmacy but the medications are free. Free pharmacies like, Reach Out; provide opportunities for low-income patients to receive the healthcare necessary to remain healthy and to provide for their families. With these clinics being free and for the uninsured, they often direct their patients toward Medicare. Reach Out cannot set them up but can direct them in the path of applying for Medicare. Because the inventory of medications in the pharmacy is limited due to funding and allowable donations, Reach Out needs to help the patients set up their governmental insurance. Reach out should have an area in the clinic that provides information to help the patients set up Medicare. This will allow their patients to receive more types of healthcare and obtain the same medications when refills are needed versus the change in manufacturers and alternatives due to lack of inventory. This will also allow the patient to obtain controlled substances, which may be critical in the patient's treatment.

CMH-4

Author(s): Alvin Boyd Newman-Caro, Brad Miner

Title: *Reach Out of Montgomery County Community Healthcare Experience*

Reach Out is a volunteer healthcare clinic that strives to provide access to exceptional health care services to the underserved/uninsured population within Montgomery County. Reach Out presents a free alternative to emergency room visits which helps alleviate their frequent and common overuse. However, an issue arises when diabetic patients are coming into the clinic with the same reoccurring issues. For example, some patients come in repeatedly with a concerning high blood glucose level and they have not made any lifestyle or dietary changes since their last visit. This is a problem because their health is not improving although they are visiting Reach Out consistently. The diabetic patient is never addressing the underlying causes of their disease. It is possible that in the busyness of the clinic, it is difficult to devote sufficient time to education on lifestyle changes such as diet and exercise. In order to address the problem, doctors need to be more informative on what this person is doing to their health. Education is essential in curbing this trend amongst diabetic patients. Developing educational materials (on diet and/or exercise) to give to these diabetic patients to take home and learn from would be beneficial.

CMH-5

Author(s): Kellie Niehaus

Title: *Expanding Healthcare Delivery in Underserved Populations: A Dayton, OH Case Study*

Reach Out of Montgomery County is a free clinic in Dayton, Ohio committed to providing access to medical services to residents of Montgomery County. In conjunction with Wright State University

Boonshoft School of Medicine medical students and University of Dayton premedical students, Reach Out conducted a healthcare assessment of Jefferson Township, a western suburb of Dayton with limited access to healthcare services. The multifaceted healthcare assessment began in December 2014 and included: an environmental scan, health fair, EMS ride-along, individual surveys, focus group discussions, history collection, public health epidemiology, EMS run statistics, and GDAHA hospital statistics. The result of this community health assessment culminated in the implementation of the Jefferson Township Community Care Team, a unique and mobile integrated approach to health care. The feasibility, improvement, and expansion of programs like the one implemented in Jefferson Township in other communities is examined.

Category: Education/Training

EDT-1

Author(s): Karissa Chow, Brian Patterson, Trevor Stump, McKenzie Shenk, Becky Brown

Title: *Effects of High-Fidelity Simulation on Student Perceptions of Interprofessional Education*

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. Our study aims to assess the change in healthcare students' perceptions of interprofessional education following a high-fidelity emergency medicine simulation. Students from a medical, nursing, and pharmacy school work together to solve various patient cases, and a validated survey is administered before and after the high fidelity simulation lab. 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.

EDT-2

Author(s): Stephanie Welsh, Juanita Draime, Rachael Libertin

Title: *STEPS Towards Better Health Care Delivery: A Student-Led Multidisciplinary Approach*

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 interprofessional, 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.

EDT-3

Author(s): John Wolf

Title: *Modern Attitudes Toward Disabilities and Their Effects on Healthcare*

Modern attitudes towards disabilities are shaped primarily by ableism and this has effects on how society views healthcare. Ableism is the ideology in which able-bodiedness is privileged and disability is discriminated. Ableism is a problem because it forces our society to discriminate against the disabled. This discrimination toward people with disabilities leads society to think that people with disabilities do not deserve healthcare because they are below able-bodied people, even though people with disabilities are the people who most need healthcare. People with disabilities are the people who most need accommodations in our society and yet most people are apathetic about putting accommodations, such as ramps, in place for disabled people. Government regulations have been put in place to make sure that accommodations for people with disabilities are put in place, and the same regulations need to be put in place so that those with disabilities are provided healthcare. Ableism shapes the negative opinions of people with disabilities in society, and proves the need for smart regulation to ensure that all people with disabilities receive adequate healthcare.

Category: Global Health

GLH-1

Author(s): Marissa Cody, Mr. Benjamin Joseph

Title: *More Dental Care for More People*

Global Brigades is a national organization that sends a group of pre-medical and pre-dental students to developing countries to help provide health care and improve the living situations of the citizens. This year, the University of Dayton traveled down to Estelí, Nicaragua, and set up two medical clinics that ran for three days. The medical clinic was arranged into different stations, including a welcome station for consultation and triage, and then several medical stations, including rooms for general physicians, a gynecology room, a makeshift dental office, a pharmacy, and education stations. The dental station was set up in a classroom, and patients sat in folding lounge chairs when being treated. Four UD student volunteers worked alongside two Nicaraguan dentists to provide extractions, fillings, and cleanings. The two dentists performed all of the dental work, including cleanings which could have been completed by a dental hygienist. The lack of a hygienist caused the dentists to have to dedicate time to performing basic cleanings when they could have been performing more procedures. If a volunteer dental hygienist was to join the team, the dentists could focus on performing extractions and fillings, while the hygienist performed cleanings. Providing a dental hygienist would increase the amount of patients being treated by the dentists, increase the amount of people receiving cleanings, and, in general, provide more dental care to significantly more people.

GLH-2

Author(s): Neil Glenn

Title: *The Importance of Clean Water*

In many countries around the world, the biggest problem that faces impoverished people is access to clean drinking water. There are many health risks that are present when drinking water is contaminated. The Global Brigades program is centered on a holistic approach to empowering communities, this means not only treating the symptoms of unclean drinking water but finding and eliminating the source. By implementing a clean water system in impoverished community we can allow residents to lead more practical and healthier lives. This program also makes sure to educate the people using it on how to properly maintain their new water system. On our trip we helped place both waste storage and removal systems as well as clean water stations for personal use. We placed concrete septic tanks underground as well as sinks and shower stations that were connected to a clean water supply. This was done over the course of 3-4 work days in a rural community. Students spend a significant amount of time in the fall preparing for this trip and a possible area of improvement could be expanding on the explanation of the work site. The students that were responsible for placing these structures had instruction from experienced workers on site. The installation of these new clean water systems has a long lasting positive impact on the public health of the communities we serve during our time in Nicaragua.

GLH-3

Author(s): Shannon Hayes, Bailey Hollihan

Title: *What Mixing Concrete Has to Do with Healthcare: Public Health Brigade, Nicaragua 2017*

Global Brigades is an international non-profit organization that allows students across the world to provide medical and public healthcare to developing countries. In January of 2016, students from the University of Dayton had the privilege of traveling to Nicaragua to participate in both a Medical and Public Health Brigade. During the Public Health Brigade, the students were given the opportunity to provide concrete floors to five different homes of a Nicaraguan rural community. Although a concrete floor may not sound like much, it is everything for these families. Many rural homes in Nicaragua contain only a dirt floor for the families to live on. This leads to an increased exposure to parasitic infection and also assists in the transmission of Chagas, a serious and often deadly disease transmitted through insects in the ground. By providing the families with concrete flooring, these health risks are significantly decreased. However, shortcomings often surface alongside great accomplishment. In order to slightly improve the Brigade for future students, it would be ideal to provide lunch to the families during the lunch hour. Currently, students have lunch in areas surrounding the homes, and many are often uncomfortable with the thought of eating in front of families with limited food. By providing the families with lunch, this issue will be solved and the families will be given additional care.

GLH-4

Author(s): Isabella Kilanowski-Doroh, Rachel McCann

Title: *Global Brigades: Improving Gynecology within Nicaragua*

Women's health in Nicaragua is not a priority for many. There is a strong negative stigma that surrounds the practice of gynecology which stems from a cultural difference in areas of privacy and occasionally embarrassment due to lack of education. Global Brigades strives to educate and treat women's health to the best of their ability with the help of a trained and competent team of physicians, including gynecologists. Although these physicians work efficiently and effectively with the resources they have, there is still a need for a heightened sense of urgency of women's reproductive health in Nicaragua. After experiencing this first hand as students, we suggest a more private examination area for the patients who wish to receive a gynecology consultation, which often includes a pap smear. Education of how pertinent this treatment can be to all women of reproductive age and beyond should also be presented to the patients of the brigade in a respectful, yet serious manner to inform them of the benefits of a gynecological examination.

GLH-5

Author(s): Julia Russell

Title: *Analyzing Electronic Medical Record Use in a Global Healthcare Setting*

In January of 2016, a group of 54 undergraduate students from the University of Dayton traveled to Nicaragua with a group of physicians and the Director of the Premedical Programs to participate in a week-long medical/dental/public health/water brigade in conjunction with Global Brigades. Global Brigades is a student led, non-profit organization that is committed to establishing a holistic

model of health in underserved communities of countries such as Nicaragua. During the medical portion of the brigade, students worked together in different roles that included patient triage, consultation, charla, pharmacy, and the electronic medical record (EMR). Students working with the EMR were responsible for the input of data corresponding to each patient seen during the brigade. Nevertheless, working with the EMR presented its own set of challenges, including inefficiency and inaccuracy. Students were not able to meet the high input demands due to the immense quantity of patients treated in the brigade, leaving hundreds of patient data sheets left to be input at the end of the day. Students also had a difficult time reading physician's handwriting and had little existing medical knowledge, leading to many human input errors. This poster will examine the consequences of these setbacks and their effects on delivering continuous quality healthcare. Suggestions for improvement on future brigades will be proposed, such as the implementation of a standard physician form and new EMR system. The possible implications of these new methods will be discussed.

GLH-6

Author(s): Victoria Spradling

Title: *Holistic Development: Integrating health and economics to create sustainable communities*

Global Brigades is an international nonprofit seeking to improve the quality of life by empowering volunteers and under-resourced communities through the largest student led movement. Global Brigades has a variety of programs in Nicaragua, Honduras, Panama and Ghana which operate on a holistic model by integrating health with economic programs. Through this, eventually Global Brigades is able to transition out of communities, leaving them fully resourced and sustainable. Global Brigades offers a vast array of brigades to University students around the globe to take part in their mission. A particularly special option is the internship program offered during the summers. Interns are exposed to every aspect of the holistic model and are given the opportunity to partake in it by carefully selecting the communities which will be participating in the movement. This process is completed after careful research and evaluation, followed by interviews with the entirety of the community to establish a partnership. Global Brigades staff is then able to prepare the community for the coming programs before sending in interdisciplinary brigades. Global Brigades staff then follow up in communities, which interns also had the opportunity to experience. After a great deal of work from Global Brigades, volunteers, and communities, a sustainable transition is able to occur. Global Brigades strives to not simply place a "band-aid" on the situation, but rather empower a community through empowering students.

GLH-7

Author(s): Jonathan Wessels, Kaitlin Beemiller

Title: *Providing Fluoride Treatments in a Medical Brigade Setting*

The University takes roughly 55 students each year on a trip to Nicaragua through a program called Global Brigades. The goals of Dayton's Brigades are to provide medical, dental, and public health to various impoverished communities. A specific aspect of the Medical brigade portion is the "Charla". The Spanish word charla can be translated to chat in English. The purpose of the charla is therefore to "chat" with the children in the communities and teach them about oral hygiene. During the charla, we provided the children with bags filled with a toothbrush, dental floss, and toothpaste. We then sang a song in Spanish in order to teach the children how to brush their teeth and how

often. After the singing, we helped each kid brush their teeth and preformed a fluoride treatment on them. One issue we ran into was lack of structure regarding providing fluoride treatments. It was difficult for us to know who had received the treatment, and who had not. The kids loved experiencing new things, so would try to receive multiple fluoride treatments, which as we know, is not healthy. A solution to this problem would be to have one of the community members, who is familiar with all of the kids, present in the charla with us so they could determine whether or not the children have received the fluoride. Another option would be to mark the kids hands with a sharpie X or wristband. If these changes were made, the charla would be improved and safer for the children.

GLH-8

Author(s): Charles Yancey, Cori Young

Title: *Educating Nicaraguan Youth on Proper Dental Hygiene and Nutrition*

The University of Dayton Global Brigades team traveled to Estelí, Nicaragua in January 2016. Global Brigades is an international organization that works on improving the health and sustainability of developing countries like Nicaragua. The UD Brigade team was comprised of 54 students, four Dayton physicians, and the director of Premedical programs, Dr. Kathleen Scheltens. The brigade lasted nine days and was split into a three day medical brigade, two day public health brigade, and a one day water brigade. The students volunteered by helping out the dentists and pharmacists, triaging patients, and teaching children how to properly brush their teeth, floss, and teach them about proper nutrition. The poster presentation will highlight personal views of how this trip broadens one's view of providing medical services to underserved populations and will provide a critique of students' experiences working in the Children's Charla. This portion of the medical brigade could be improved by providing children and their parents with a take-home dental education pamphlet in addition to the toothbrush and toothpaste paste given to each child. There is a need to provide the community youth with an enduring understanding of proper dental hygiene. An example of a take-home pamphlet that outlines appropriate methods of brushing one's teeth and approved dietary list for maintaining healthy teeth will be shown. This pamphlet is constructed to meet the health literacy levels of the child and parent and uses diagrams and pictures to educate the targeted audience.

GLH-9

Author(s): Elizabeth Yerman

Title: *Global Brigades Pharmacy Transformation*

Global Brigades is an international non-profit organization that helps members of under resourced communities receive health care and other resources through student volunteers. In January, a group of 54 students traveled to Nicaragua for a medical, public health and water brigade for nine days. During these nine days, over 1,000 patients were able to receive medical care and five families received sanitary stations and cement floors in their homes. In addition, the students were able to grow as individuals as they saw the compassion of doctors and the gratefulness of the patients. During the medical brigade, students had the opportunity to take medical history and vitals in triage, shadow physicians, assist in the pharmacy, and teach children about overall health issues. The medical brigade allowed students the opportunity to work in the pharmacy where they were able to become more familiar with medicines and their usages. However, there were times when

doctors wrote down medicines that were not available or that students were unfamiliar with and could not find for the patient. If the volunteers were all educated more on the purpose of the medicines provided and also had a sheet where physicians could simply check off the medicine being prescribed, it would be very beneficial to the community as well as the volunteers. Overall, the brigade was and continues to be a major success, but if these improvements were implemented, the brigade would be able to provide healthcare more efficiently for the community.

Category: Healthy Eating and Obesity Prevention/Treatment

HEO-1

Author(s): Katie Banchek, Neal Bucher, Gina Hurst

Title: *Primary Prevention of Pediatric Obesity: Evidence-based Programs in School-Based Health and Nutrition*

According to the CDC, approximately 17% of children aged 2 to 19 are obese and 30% are overweight. Pediatric obesity has been associated with metabolic and psychological conditions that were once seen primarily only in adult patients. The purpose of this project was to identify exemplary primary obesity prevention programs delivered in school that are built on evidence-based practices in pediatric weight management. Suggestions for future research on school-based obesity prevention will be provided.

HEO-2

Author(s): Brandon Cook, Jenna Kurz, Courtney Day

Title: *Evidence-based Approaches to Developing Healthy Eating Habits Early in Life*

According to the CDC, over 8% of preschool-aged children meet criteria for obesity (2015). Establishing healthy eating habits early in life can help prevent weight problems and related diseases in later childhood and adolescence. A review of the literature in the areas of behavioral pediatrics, developmental psychology, and pediatric psychology was conducted to identify parenting practices that have been found to be related to healthier food choices by children. Evidence-based recommendations for encouraging healthy eating in young children will be presented.

HEO-3

Author(s): Emma Creekbaum, Alex Knueven, Audra Rougraff

Title: *Revision of Weight Loss Factsheet to Increase Readability for ESL Students*

In the United States, the average adult reads at an 8th grade level, but most health documents are written at a 12th-16th grade level. Therefore the majority of Americans cannot comprehend health information. According to the Journal of American Medicine, 78.6 million American adults are considered obese. We determined that a factsheet from the National Institute of Diabetes and Digestive and Kidney Diseases about weight loss was written at a 9.6 Flesh-Kincaid grade level. This is too high for many American readers, but particularly too high for those in the Intensive English program (IEP). In order to increase the general knowledge about losing weight, we revised the original document paying close attention to the four aspects of health literacy by focusing on the fundamental, cultural, civic, and scientific issues within the document. We reduced the readability to a 3rd grade reading level. We presented the revised document to a Level 2 Intensive English Program class at the University of Dayton. We found that because of our revisions, the IEP class understood the document fairly easily. Within health care, it is extremely important for patients to comprehend, evaluate, and use the health information presented to them by their physicians and

online. Consequences of low health literacy include, but are not limited to, higher mortality, lower levels of adherence, less access to health insurance, and add billions of dollars to healthcare costs.

HEO-4

Author(s): Stacey Lapurga, Erica Derifaj, Allison Sandoval

Title: *The Effects of Health Literacy on Maintaining a Balanced Diet*

A majority of health and nutrition documents are written at a collegiate reading level, but the average American reads at an eighth grade level. We revised a healthy eating guide from HelpGuide.org for students in the Intensive English Program (IEP) at the University of Dayton. These students typically read English around a fourth grade level. Using Microsoft Word, we found that the document was written at the ninth grade reading level, which can be hard for even the average American to understand, let alone an international student. Initially, we went to an IEP class and asked them a set of questions to understand their current knowledge and concerns about healthy eating and maintaining a balanced diet. We revised parts we thought would be helpful to the IEP students by modifying certain sections of the document we thought would be beneficial to them. The second time we visited the IEP class, we presented them with our revised document and observed how effective our document was in informing them about the information they were concerned about. As a result, they were able to understand a majority of the information that was written for them at a lower literacy level. Overall, the results of our revisions were successful in closing health literacy gaps that the IEP students faced.

HEO-5

Author(s): Anthony Oddo, James Ebert MD, MBA, MPH

Title: *Physician Communication Strategies Regarding Pediatric Obesity*

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. 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. 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 weigh 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: 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.

Category: Social Determinants of Health

SDH-1

Author(s): Morgan Beemiller, Julia Russell, Kevin Outwater

Title: *Health Leads: Helping Your Social Needs*

When a patient enters the hospital, it is expected that their physical health needs are met. But what about their social health needs? Research has shown that social health needs, such as a lack of food, housing, or financial resources have a strong detriment on health. Health Leads is a program that has been developed in order to connect patients to community resources as a means of addressing their social health needs. The Health Leads program works with undergraduate students and volunteers, known as advocates, who work with a database, customized for the specific target population and location, to provide families with the resources that they need to meet certain social needs. Health Leads has adopted a desk model, where a patient's visit to the hospital is used as an opportunity to address the non-medical issues that can affect one's health. Dayton Children's Hospital has teamed up with Health Leads to establish the Family Resource Connection, a program to address social needs right here in Dayton, Ohio. Together with Health Leads, Dayton Children's plans to implement a screening tool and resource referral program, using an online software program known as REACH, populated with numerous local and national resources. It is the goal of Dayton Children's and Health Leads alike to spark change and hopefully improvement in healthcare delivery, resulting in a greater number of healthy children nationwide.

SDH-2

Author(s): Melanie Craft, Olivia Grondalski, Grace Legan

Title: *Food Deserts: Social Determinants Affecting A Child's Health*

Quality health care is only responsible for a portion of a child's health, social and behavioral determinants also have a significant impact. The lack of quality groceries, in specifically low-income areas of Montgomery County, has adverse effects on children's health. While unexpected, the issue of food insecurity is a leading cause of childhood obesity. A typical child in poverty may not know where his or her next meal is coming from, therefore, he or she will eat anything, and as much that is available. Unfortunately, the food that is available will usually not be nutritious. Data suggests that children from low income areas are at higher risk for developing childhood obesity. Fighting against childhood obesity is an extremely important task because obese children are more likely to become obese adults. With obesity, come a number of severe chronic diseases, accompanied by potentially crippling medical bills. In Montgomery County, 7 of the top 10 causes of death are due to a chronic disease. By decreasing the amount of overweight and obese children, the vicious cycle of obesity and suffering from chronic diseases can be severely decreased.

SDH-3

Author(s): Erica Derifaj, Lexi Miles

Title: *Social Needs of Montgomery County and How they Affect Health*

This research project studies social needs and how they affect the health of children in Montgomery County. While genetics do influence a large portion of a child's health, their home life, school environments, and stressors have been found to influence a large portion as well. A significant percentage of Montgomery County children are encountering social needs that are resulting in negative health outcomes. These social needs include, but are not limited to: housing, health accessibility, poverty, hunger, and education. These issues have caused psychiatric and behavioral disorders in children, such as anxiety and depression disorders, and attention deficit/disruptive behavior. This report provides insight into the health outcomes from social determinants.

SDH-4

Author(s): Wendy Lillystone, Cori Young

Title: *Environmental Determinants: Home Hazards for a Child's Health*

According to Safe Kids Worldwide, each day 10,000 children go to the emergency department for illnesses that are induced by a home environment. Children can experience poor health outcomes such as asthma due to exposure to mold, allergens, and second-smoke in their homes. An additional risk factor for poor health includes exposure to lead, which can lead to cognitive impairments. These environmental determinants can lead to poor health outcomes in children and are many of the most common reasons children visit the emergency department. After assessing some of these health hazards, tips and solutions to maintaining a healthy home will be introduced. It is imperative for parents and caregivers to be vigilant of potential risks within a home and be informed of methods of improving their households. Children lack the ability to advocate for themselves and issues within the home are prime contributors of unnecessary childhood hospitalizations and potentially life-long impairment.