

18th Annual International Seminar and Poster Session

“Innovation in Osteopathic Medicine and Global Health”

Poster Session Abstracts

AOA Bureau of International Osteopathic Medicine

Saturday, September 17, 2016

8:00 a.m. to 1:00 p.m.

Anaheim Convention Center & Arena

Anaheim, CA

Room: 201C

Posters in Exhibit Hall



Best Overall

Abstract Title:

The Detrimental Effects of Biomass Sugarcane Burning on Human Airway Epithelial Cells

Abstract Number: 2016BIOM2502

Abstract Authors:

Gary Willyerd, DO; George Park, BS; Katelyn Phelps, DO; Lorenzo Lim, DO; Ning Li, PhD; Ruben Kenny Briceno, MD; Santiago Benites, ScD; Shane Sergent, DO

Michigan State University College of Osteopathic Medicine

Exposure to airborne particulate matter (PM) is a major risk factor for cardiopulmonary disease. Compared to known adverse health effects secondary to engine combustion-related PM, there is a limited understanding of the hazardous effects of PM due to biomass burning. This process is required in the harvesting process of various plant-based products, including sugarcane, which generates a significant amount of uncontrolled PM. There have been numerous studies linking smoke exposure to increased respiratory morbidity (e.g., pneumonia, asthma, and allergic rhinitis), hypertension, and genomic instability. Historically these studies have been geographically restricted and not based on cellular models.

In Trujillo, Peru it was noted there was an increased incidence of patient visits due to upper respiratory symptoms in the sugarcane burning effected areas. Our study sought to correlate the effects of sugarcane burning-derived particles on human airway epithelial cells. The central hypothesis is that PM ($\leq 2.5 \mu\text{m}$, PM_{2.5}) generated during sugarcane burning can induce stratified oxidative stress responses in human bronchial epithelial cells including oxidative stress, inflammation and cell death.

Our novel approach is to determine the effects of PM_{2.5} on human bronchial epithelial cell line BEAS-2B. PM_{2.5} contaminants will be collected in Trujillo, Peru before and during the sugarcane burning season. During this time chemical characterization will be determined using in vitro studies to assess particles' effects on BEAS-2B cells with endpoints of oxidative stress [hemeoxygenase-1 (HO-1) and reduced to oxidized glutathione ratio (GSH/GSSG)], inflammatory mediator production [interleukin-6 (IL-6), interleukin-8 (IL-8) and tumor necrosis factor alpha (TNF α)], and cell death [lactate dehydrogenase (LDH) release]. Using this model the effects of PM ($\leq 2.5 \mu\text{m}$, PM_{2.5}) on primary normal and asthmatic human bronchial epithelial cells will be determined. The utilization of bronchial epithelial cells will determine an individual's susceptibility to the adverse respiratory effects of sugarcane smoke.

To date, studies conducted in Brazil, Mexico and many other regions have focused on identifying the adverse health effects of sugarcane burning smoke using epidemiological methods. This collaborative project will not only be the first to conduct such studies in Peru, but also provide an understanding in the cellular and molecular mechanisms that lead to the adverse health outcomes. The results of this study will ideally help create sustainable efforts to promote health regulations to these at-risk populations in Peru.

Outreach Category – 1st Place Winner

Abstract Title:

Obstacles and Success of Performing OMT in Rural Ecuador

Abstract Number: 2016BIOM2474

Abstract Authors:

Breanna Willeford, BS; Erin McAtee, BSA, BS; Kevin Hayes, DO; Robin Piper, BS; William Fleming, BS

Alabama College of Osteopathic Medicine

Methods/Summary

A team consisting of eleven osteopathic medical students and two faculty members from the Alabama College of Osteopathic Medicine (ACOM) traveled to the province of Imbabura, Ecuador to conduct an osteopathic medical outreach program for eight days in July of 2016. The students were incoming OMS-II and the faculty members included the Assistant Chair of Osteopathic Medicine and a Professor of Pharmacology. The team was hosted by a local physician who is the Vice President of the Asociación Nacional de Médicos Rurales (ANAMER) which is the national association of rural physicians. Our team worked with these local physicians to conduct three medical brigades in areas of need. While in clinic, students were able to complete intake, measure vital signs, shadow/assist physicians with history and physical examination, work in the pharmacy, as well as perform Osteopathic Manipulative Treatment (OMT). Students performed OMT under the direct supervision of an osteopathic physician and were able to utilize their first year of osteopathic medical training. Students performed OMT only when indicated in the presence of somatic dysfunction. OMT was performed with patient consent and monitoring. Students evaluated musculoskeletal pain complaints, performed an osteopathic structural exam, and made the provisional diagnosis of somatic dysfunction when identified.

Results/Conclusion

In these populations the most common musculoskeletal pain complaints were the shoulder, knee, and low back. While a variety of OMT was performed on localized somatic dysfunction, students most commonly performed two techniques: counterstrain of the shoulder girdle and ligamentous articular strain (LAS) of the knee. Patient treatment was recoded as a positive outcome if the patient expressed pain relief and/or the practitioner felt tissue release or a pulse. 65 patients were treated with LAS of the knee of which 57 had a positive response, indicating an 88% success rate. 26 patients were treated with counterstrain of the shoulder of which 22 had positive response, indicating an 84% success rate. There were many obstacles to treatment including lack of exam tables, difficulties with the language barrier, time constraints, and number of patients requesting treatment. To conclude, students were able to utilize OMT under the direction of an osteopathic physician with measured success. Osteopathic medical students and practitioners should continue the use of OMT abroad to promote our core tenets.

Outreach Category – 2nd Place Winner

Abstract Title:

An Innovative Approach to Improving Water Quality Along the Amazon River Using Biosand Filters

Abstract Number: 2016BIOM2495

Abstract Authors:

Gary Willyerd, DO; Shane Sergent, DO; Taylor Dickey, OMS-II

Michigan State University College of Osteopathic Medicine

As one of the largest sources of freshwater, the Amazon River Basin is the primary source of water for approximately 120,000 indigenous people of Peru. While many developing communities struggle with water availability, the Amazon River Basin populations have a very unique dilemma. Much of this water is undrinkable given the presence of toxic elements, which often occur from deforestation, mining and commerce. The problem is compounded from bio-magnification and limited knowledge regarding proper water sanitation. Often these factors are first manifested in a variety of ways clinically, from renal dysfunction to gastrointestinal disturbances.

Over the years, many international communities have sought water quality improvement projects. Many of these projects are costly, labor intensive, and have unique filtration system limitations. This project sought to compensate for these limitations in an innovative model. The pivotal aspect of this project was creating a filtration device that that would utilize local materials

and resources. It was also important to limit the complexity of the system so this model could be easily reproducible. This goal was achieved using a gravity-based filtration system which incorporated carbon, sand, and stone as the fundamental filter materials. The filter then was placed in a closed system to encourage anaerobic bacteria selection. It was hypothesized that using a bio-filtration there would be a natural elimination of disease-causing bacteria and thus reduce the prevalence of water-borne illnesses in these populations.

Prior to implementation in the Amazon River Basin, a trial system was built and water samples were collected and processed through the Michigan Department of Environmental Quality after the biofilm was given 3 weeks to develop. The water was then tested for E. coli, a partial chemistry test, and arsenic in order to determine the effectiveness of filtration. Data showed a significant reduction in toxic materials, most notably the total elimination of arsenic, iron, and nitrite.

Using this model, a trial program was started by distributing 25 filters throughout different villages in the Loreto region of Peru which use river water as their primary source of drinking water. While the project was successful in distributing water filters, there is still much to be done over the next few years. Patient education and development of effective biofilms are two of the most crucial aspects to the success of the project. If proven effective, a genomic map of these biofilms can be developed providing specific data for future targeting water purification systems. Overall this model could have enormous implications for the health status of families and communities along the Amazon and can hopefully be later replicated in other developing nations.

Outreach Category

Abstract Title:

Assessing Impact of Schistosomiasis Education and Outreach in the Masonga Village of Tanzania

Abstract Number: 2016BIOM2514

Abstract Authors:

Eiman Mahmoud, MD, MPH; Jonathan Shaked, BA; Mohammad Reza Khorsand, MS, BS

Touro University College of Osteopathic Medicine – California

Intro: Schistosomiasis poses a major threat to the well-being of those who are in highly endemic areas. In the past, students from Touro University California assisted a local hospital in Shirati, Tanzania in screening and treating schistosomiasis in nearby villages, including Masonga. These efforts relied on stool sampling, which presents itself as a time-consuming, costly, and error-prone method of screening for the presence of *Schistosoma mansoni* eggs. However, due to the high risk of

acquiring schistosomiasis, including occupations as fishermen and using water from Lake Victoria, where *Schistosoma* is known to reside, we propose a new effort to combat schistosomiasis. In accordance with the Tanzanian government's new protocol of (deworming) prophylactically treating primary school children, we sought to treat individuals who were at higher-risk of acquiring schistosomiasis, as previously mentioned. By taking praziquantel once a year, the locals would be safe from schistosomiasis until the following year. In addition, we wanted to observe whether or not previous efforts in educating the community regarding Schistosomiasis were effective in long-term understanding of how to prevent the disease. To summarize, we want to evaluate the retention of education efforts within Masonga as well as initiate a notion within the community to seek prophylactic treatment for Schistosomiasis.

Methods: In a collaborative interprofesional team of physicians, pharmacists, and translators from Shirati Hospital, the Touro students organized a hybrid outreach event where we screened and provided treatment regimens for diabetes, hypertension, and malaria as well as surveyed locals, of all ages, regarding Schistosomiasis and provided praziquantel for those individuals who were thought to be high risk for acquiring the infection. Individuals who attended ranged in ages from 6-months-old to 75-years-old and were predominantly from Masonga. Answers to each question were recorded on respective survey cards and evaluated after the return from Tanzania.

Results & Conclusion: Through the outreach event in Masonga, we were able to screen 134 individuals for the health concerns discussed. Eighty-eight of these individuals were surveyed regarding their knowledge of Schistosomiasis. The average age for survey participant was 27-years-old. Fifty-three of the survey participants were male and 35 of the participants were female. In regards to whether or not they had previously been diagnosed with Schistosomiasis, 42% (37) responded that they had received a prior diagnosis but only 68% (25) of these had ever been treated for it. Particularly pertinent is that only 15%, 13 of 88 respondents, had been treated within the last year with five answering that they were not sure if they had been treated. Given the survey population was at high risk for infection and that praziquantel treatment is only effective for one year, a much higher number may have been expected or at least targeted.

Remarkably, while only 23% (20) of respondents had received any education on Schistosomiasis prior to that day, 44% (39) knew how it could be spread and 66% (58) treated their water in some way. This may point to several different possibilities regarding health education in the area. The first may be that whether or not they know about the mechanism of disease transmission, people can initiate protective behaviors to keep themselves from getting it. These behaviors can be taught by volunteer groups and government efforts and then spread throughout people's families and communities. As part of our own outreach, we reminded each survey participant to treat (preferentially by boiling) all their water prior to use. Since this benefits both their own health as well

as that of their loved ones, the behavior modification has spread through their communities and we encouraged them to continue to do so.

Seventy-eight survey responders received praziquantel. At the discretion of the Shirati Hospital physicians, several attendees did not receive praziquantel, including those who were deemed too young and an individual who was in her third trimester of pregnancy. Recent recommendations from the WHO allow treating these patients which may have yet to affect physician practice in endemic areas. Part of future outreach efforts may also want to center on spreading the most recent guidelines to treat any patients that may benefit.

Limitations of the survey data include not having any records of participants' prior medical histories. All responses were from participants' own memories. While this suggests that the diagnosis and treatment statistics may suffer from recall bias, it has the power to point to what recommendations and types of information are making an impact on beliefs and behaviors related to Schistosomiasis. The survey is highly suggestive that prior outreach programs from universities such as Touro University California and the outreach efforts of the Tanzanian government have moved people to treat their water regardless of their understanding regarding the disease itself. The central focus of these efforts should be the protective behaviors that can be not only taught but shared among other family members and neighbors.

Extra: The Schistosomiasis questions were as follows:

1. Have you been diagnosed with schistosomiasis?
 1. When?
2. Have you been treated for schistosomiasis with praziquantel?
3. How often do you receive praziquantel to treat schistosomiasis?
4. When is the last time you received praziquantel to treat schistosomiasis?
5. Have you ever received education about schistosomiasis?
 1. When? Where?
6. Do you know how schistosomiasis is spread?
 1. Do you boil or treat your water (e.g. with chlorine or 2-3 days of direct sunlight?)
 2. If yes, which? How often?
7. Do you know the signs that may suggest you are infected with schistosomiasis?
8. Do you know how schistosomiasis can affect your health?
9. Would you be like to learn more about schistosomiasis?
 1. Were you present at the education this morning? If so, was it helpful?

The most important questions regarding the effects of outreach efforts were question numbers five through eight.

Abstract Title:

Breaking through Language Barriers- A Critical Aspect of Medical Outreach

Abstract Number: 2016BIOM2512**Abstract Authors:**

Kathryn Becker, OMS-II

Pikeville College School of Osteopathic Medicine

Methods/Summary: 11 KYCOM students participated in a 6-day Medical Mission Outreach program through Chosen-International Medical Assistance in the Yucatan Peninsula of Mexico. Based at Centro Medico San Lucas in Valladolid, MX, the students alternated days assisting in surgical procedures at the hospital and traveling out to remote Mayan villages with Mexican primary care physicians. In the villages, students were responsible for helping triage, take vitals and patient histories, presenting cases to the physicians, and then counseling the patient with treatment orders. Students also helped supervise village children and acted as support to general helpers of the mission at the pop-up pharmacy and reading eyeglass distribution stations.

Results/Conclusions: Having partnered with 5 surgeons and a nurse anesthetist team at Centro Medico San Lucas, we saw 100 patients for surgical consultations and procedures. By partnering with 5 Mexican primary care physicians, we helped see 283 indigenous patients in the Mayan villages and were able to refer 100 of them to the medical center for follow up care. 300 prescriptions were filled from donated medications and 362 pairs of donated eyeglasses were distributed. While we made a significant and positive impact in the medical center and villages, we were faced with significant language barriers both in Spanish and Mayan. Without professional translators on site in villages, only 1 of our 11 students spoke fluent Spanish enough to be involved in history taking, presenting, and treatment counseling. Due to time constraints and limited number of caregivers who could effectively communicate, the mission had to cap the number of patients who could be seen in the villages and turn some patients away. In conclusion, medical Spanish is a vital skill for physicians and other health care workers to learn as it opens the door to being able to efficiently contribute to outreach projects both in underserved areas of the United States as well as Central and South America.

Abstract Title:

The New Osteopathic Community Health Worker

Abstract Number: 2016BIOM2511

Abstract Authors:

Carolina Espindola-Camacho, OMS-II; Daniel Ebbs, OMS-IV; Deborah Heath, DO; Friederike Doerstling, OMS-II; Jenni Adams, OMS-III; Joy H. Lewis, DO, PhD; Julian H Hirschbaum, OMS-IV ; Stanton Jasicki, OMS-IV; Starr Matsushita, OMS-III

A.T. Still University, School of Osteopathic Medicine in Arizona

Over the last three years, the Global Health Honors Society (GHHS), a student-led international health organization within A.T. Still University School of Osteopathic Medicine in Arizona has conceptualized a new type of community health worker (CHW): the osteopathic community health worker (OCHW). Integrating this concept with innovative training methodologies such as “train-the-trainer”, “flipped classroom”, and community engagement, has led to the development of a sustainable and effective health program serving over 30,000 underserved residents within the Peruvian Amazon and Northern Ugandan regions. This model has been initiated and carried out in partnership with non-governmental organizations and local health ministries as a community-focused program intended to increase access to primary care services in remote areas of the developing world. As such, OCHWs, trained by GHHS members, eventually transition into a leadership and educator role in order to further program expansion and community-based participatory research. GHHS continues to follow-up biannually, collecting further data on progression of the program, and reaching out to expand and develop new projects. All training programs utilize innovative mobile health (mHealth) applications on computer tablets to optimize retention of medical skills, transition to educator roles, disease surveillance, community health education, and patient record keeping. Additionally, preliminary data collected in Peru has demonstrated significant increases in CHW utilization by community residents one year after program implementation. By utilizing the model outlined above, GHHS will continue to augment and adapt its programs and research in order to most effectively support each community in meeting its own greatest health needs.

Abstract Title:

The Wounded: Wound Care Experience and Observations at an Assisted Living Facility in Cartago, Costa Rica

Abstract Number: 2016BIOM2510

Abstract Authors:

Maggie Marie Gerck, BS

Western University of Health Sciences College of Osteopathic Medicine of the Pacific

In the United States, access to quality healthcare is often taken for granted. I had the opportunity to travel abroad to Costa Rica this summer and volunteer at an assisted living facility called Asilo de la

Vejez in Cartago. It is a facility that holds about 100 residents. It is a non-profit organization funded largely by the government that cares for elderly individuals with a disadvantaged status. Many of these individuals have multiple medical problems that make them wheelchair or bed bound. I was able to help with a variety of tasks such as wound care, sorting medication, assisting with feedings, physical therapy sessions and more. A significant problem in this patient population was wound care necessitated by an extremely high incidence of cellulitis and pressure ulcers. Notable differences in wound care between what was available at this institution as opposed to many health care facilities in the United States included little understanding of prevention and sanitation methods, a lack of basic resources, and a lack of adequate pain management. Due to a marked lack of resources and lack of staff, a nurse would apply cream to a patient and then move onto the next patient without changing gloves. This simple sanitation issue may have helped facilitate the spread of cellulitis to other patients. Their procedure for cellulitis management was shocking. Equally disturbing was the management of pressure ulcers.

In the US, there is a prevention protocol for high risk patients that involves changing the pressure points every few hours to prevent development of. Due to lack of staff, such measures of prevention were not possible. Thus, many of the wheelchair and bed bound patients had severe pressure ulcers. These ulcers were cleaned with gauze pads, water and, in severe cases, a small amount of soap. A cream would then be applied, the wound would be re-wrapped and the patient would often be returned to the position that he or she was in before. Many patients would groan or swear as their wounds were being cleaned. One lady cried every time the bandage was changed on her ulcers because she was in so much pain and the ulcers were so deep. No medications were available to manage the pain during these cleanings.

In summary, the wound care procedures at this facility could be improved if this facility could afford adequate supplies, a few more employees and improved education on the importance of sanitation and wound prevention.

Abstract Title:

Impact Assessment of Helping Babies Breathe training: A Comparative Study in Tanzania and Ethiopia

Abstract Number: 2016BIOM2509

Abstract Authors:

Alissa Farrell, DO; Bhavin Joshi, BS; Eiman Mahmoud, MD, MPH; James Devanney, BS; Mohammad Khorsand, MS; Paras Savla, BS; Quinn Fujii, BA; Shiree Segev, BS; Sundeep Bekal, BA; Yoyoung Yang, MS

Background: As developing nations, Ethiopia and Tanzania face many challenges in health care, including accessibility to skilled perinatal care. Arguably the most efficacious and cost-effective way to approach this issue is by training community health workers using standardized protocols. Helping Babies Breathe (HBB) is an evidence-based educational movement endorsed by the AAP/WHO and is used to teach healthcare providers in rural areas how to resuscitate newborns. The purpose of this study was to compare the results of HBB training between cohorts in two different countries and between healthcare providers with varying skill levels. The HBB curriculum is accessible for all levels of experience, so we expected confidence and ability to improve equally in both sites.

Methods: HBB was taught by certified instructors to 96 healthcare workers in two east African sites (Shirati, Tanzania and Assendabo, Ethiopia). Participants included nursing students in Tanzania and health extension workers and traditional birth attendants in Ethiopia. A paper survey was given to participants before training to assess level of training and confidence in concepts of neonatal resuscitation. A second survey was given after training to re-assess participant understanding of the concepts as well as confidence in using the techniques taught. Surveys were then analyzed to determine changes in knowledge, confidence and attitude toward using HBB techniques when attending births.

Results: In the Tanzania cohort, there was a 39.4% increase in participants who showed “Complete Knowledge” after HBB training. Other performance trends express an overall increase in knowledge. Confidence increased by 10.5% after HBB training. All nursing students found the training useful and 60.5% reported that they will utilize what they learned from the training.

In the Ethiopia cohort, there was no change in the number of participants who showed “Complete Knowledge” after HBB training. There was a 60% and 35% increase in participants who showed “Some Knowledge” and “Proficient Knowledge” respectively. Overall performance trends expressed an increase in knowledge. There was no change in participant confidence after HBB training. Nearly all (96.43%) of the participants found this course to be useful and 48.42% of the participants reported that they will utilize what they learned from the training.

Discussion & Conclusion: Our data reveals HBB training sessions have produced a measurable increase in knowledge in both trainee populations, with many Tanzanian trainees demonstrating “Complete Knowledge”, and many Ethiopian trainees demonstrating “Some Knowledge” or “Proficient Knowledge”. One possible explanation for the marked increase in “Complete Knowledge” in the Tanzanian cohort is that they are composed of nursing students with experience learning in a structured setting and working at a regional hospital, which the HBB course is based

upon. Ethiopian trainees, however are composed of community health workers with limited professional education, which reflected in less trainees achieving “Complete Knowledge”. However, they did demonstrate increased knowledge as a sizable number of trainees entered the “Some Knowledge” or “Proficient Knowledge” categories. The limited increased confidence in Tanzania, and unchanged confidence in Ethiopia after training both reflected relatively high confidence prior to training. This may have resulted from trainees falsely believing they understood how to use the Bag Valve Mask properly prior to training. This demonstrates the need for continued and frequent opportunities for hands-on training using Bag Valve Masks. Despite feedback on the course being overwhelmingly positive, many trainees felt they would not change their current practice. This may have resulted from difficulty overcoming ingrained habits or difficulty accepting new information from foreign teachers in a single training session. This demonstrates the need for year-round training from local instructors and renewed emphasis that HBB training will reduce neonatal mortality if applied consistently. Local advocates are vital in order to make this program sustainable and are of the utmost importance in trying to overcome these barriers to changing current practices.

Overall, our data demonstrates that HBB training sessions result in increased knowledge, confidence, and attitude in all trainees. HBB can be taught to many trainee populations, from health professionals at tertiary hospitals to community health workers at local clinics. Our data suggests that measured increases in knowledge is less for trainees with less health professional experience as in the case of Ethiopia. One possible solution is to increase the amount of training in this demographic through repeated HBB sessions. Continued application of HBB helps reduce neonatal mortality worldwide, but it is still important to accommodate the trainee’s previous health experience when instructing them on HBB.

Abstract Title:

Determining the Adequacy of a Viable Research Environment: Plan for Case Control Trial to Evaluate the Effect of OMT on Active Labor Time and Intra-Partum Complications

Abstract Number: 2016BIOM2504

Abstract Authors:

Jennifer Puztay, BA; Manuela Noriega, MPH; Tristan Reynolds, DO

University of New England College of Osteopathic Medicine

Recent studies have shown osteopathic manipulative treatment (OMT) to be effective for reducing pain and functional deterioration during the third trimester of pregnancy¹. However, the effects of osteopathic manipulation during active labor has not been recently evaluated. The current standards of care in the United States medical system do not offer the opportunity for the evaluation of using

exclusively OMT for labor pain management and aiding in labor progression within a hospital setting. Hospital Nacional Dos de Mayo in Lima, Peru is an institution lacking the resources to offer epidural labor pain management for vaginal deliveries. As such, Hospital Dos de Mayo offers an opportune setting to research alternative pain management strategies.

This outreach project examined the possibility of the exclusive use of OMT for pain management in primigravid patients in active labor at the Hospital Nacional dos De Mayo. From the time of triage until the time of delivery, there was often ample time and adequate conditions for the use of OMT for labor pain management and correction of somatic dysfunction. Preliminary use of sacral techniques in two patients demonstrated a reduction in the time of active labor similar to the reductions found by Whiting².

In Peru, multiple barriers exist for the access to pharmacological pain management during active labor. This project will assess the effectiveness of OMT to shorten labor times and ameliorate labor pain; with a secondary goal of evaluating delivery outcomes. Based on the results, it could offer incentive to train local providers in safely performing OMT in laboring patients with the ultimate goal being to successfully assist patients with pain management and improvement of labor outcomes without the need for additional financial resources from the hospitals or patient.

Abstract Title:

Detection of Tuberculosis with the use of Magnetic Nanotechnology Particles (MNPs)

Abstract Number: 2016BIOM2503

Abstract Authors:

Daniel Asher-Bakalar Tobes, BA; Evangelyn Alocilja, PhD; Gary Willyerd, DO; Joseph Gorz, DO; Kasey Pryg, BS; Katelyn Phelps, DO; Lorenzo Lim, DO; MaryBeth Shively, MPH; Ruben Kenny Briceno, MD; Santiago Benites, ScD; Shane Sergent, DO

Michigan State University College of Osteopathic Medicine

To halve the prevalence of *Mycobacterium tuberculosis* (*Mtb*), a 2005 JAMA article projected that, “TB control programs must reach global targets for detection of 70%, treatment success of 85%, and also reduce the incidence rate by at least 2% annually.”¹

The time it takes to grow *Mtb* in culture (typically 6-8 weeks) creates a challenge. With the significant morbidity and infectivity associated with *Mtb* patients, it is imperative that quicker detection be available. The use of nanotechnology has allowed for a new realm of discovery and has created practical relevance in field-based detection of disease threats². The use of a biosensor to detect disease threats is important for the fields of public health, medicine, and biodefense. Therein

lies the opportunity for MNPs to detect *Mtb* in patients quickly (under one hour) and at an affordable cost.

This research involved training Peruvian healthcare professionals in proper sample collection and processing. They will continue to collect and process samples in coordination with the Peruvian Ministry of Health. Patients with a high suspicion for *Mtb* will then enter the study and a sputum sample will be collected, concentrated with the assistance of magnetic nanoparticles, and analyzed.

Dr. Alocilja and collaborators developed these MNPs with the intent of more easily separating and distinguishing pathogens from patient samples. The MNPs are novel particles that are able to bind most bacteria, thereby leading to an easy method of separation from the medium with the use of neodymium magnets.

The first aspect of the study is to research a potential screening tool with the use of the MNPs to detect bacteria. In this specific study the bacterial load can be measured through the relative amount of electron transport chain activity (used as a proxy). This is determined through potentiostatic measurement of extracellular reduction of potassium ferricyanide. Secondly, by aggregating *Mtb* to the MNPs, followed by magnetic separation and subsequent resuspension in a smaller volume, it is possible to achieve higher concentrations of *Mtb* in the samples leading to more efficient and accurate microscopy. Preliminary studies with the use of nanoparticles thus far have showed positive bacteria results with 100-1000 CFUs/milliliter.

The current gold standard microscopy has many challenges including its cost, complexity and time delay. Other methods, such as the attachment of a *Mtb* antibody to the MNPs would allow for more sensitivity, but at this point the cost is prohibitive. Research has shown that the current standard of microscopy of *Mtb* samples with acid-fast staining can detect this disease at a rate of only 50%³. With nanotechnology there is hope to achieve higher detection rates and ultimately lessen the burden of this public health threat.

Abstract Title:

Healthcare Outreach in the Central Plateau of Haiti: Lack of Continuity and it's Effects on Chronic Illness

Abstract Number: 2016BIOM2501

Abstract Authors:

Elizabeth Ann Chu, DO; Gabrielle Jasmin, DO

Touro College of Osteopathic Medicine

In December of 2015, we traveled to Thomonde, Haiti with members of TouroCOM's International Medicine Club. Thomonde is located in the Central Plateau, one of the poorest regions in the country. Our collaboration with Project Medishare, a leader in providing community health to Haiti's Central Plateau, proved extremely effective in reaching a substantial patient population. Under the guidance of Dr. Bruce Mintz, DO, we collaborated with translators to provide basic healthcare to local residents. Working together, we organized mobile clinics at various abandoned school houses and empty churches. Adjacent to each clinic site was a pharmacy equipped with a wide array of pharmaceutical interventions if needed.

Students were able to attain thorough patient histories, vital signs, and perform physical examinations on each encounter. Patient populations ranged from Pediatrics, Internal Medicine and Obstetrics and Gynecology. After discussing the case with the attending physicians, basic medications were prescribed. Going beyond medical aid, we also helped Medishare distribute donated clothes to children who lived in the surrounding villages.

Medishare is an organization with a continuing commitment to rural communities. By establishing and funding sustainable programs that utilize medical charts, patients are able to have long-term care in a remote area. These charts are helpful in briefly updating the volunteers on the patients' medical histories, medications, and other pertinent information. Maintaining continuity of treatment and follow-up is important to ensure maximum efficiency in patient care.

Due to lack of supply, it is difficult for pharmacists to distribute the full quantity of medication prescribed. This can pose a serious threat to patients suffering with chronic conditions. For example, when hypertensive patients cease to take their medications, rebound hypertension can result. Patients with asthma that stop low dose inhaled corticosteroids double their risk of developing an asthma attack within six months. Working with Medishare to secure proper avenues for patients to obtain not only the correct medication, but also the correct amount, is vital in our mission to providing adequate primary care and preventative medicine in the region. In the future, we hope to work with our administration to provide extra funding that can go toward bolstering the medications available to patients in Haiti.

Abstract Title:

Integration of Osteopathic Principles and Practices into Peruvian Healthcare Education

Abstract Number: 2016BIOM2500

Abstract Authors:

Angela Amaniampong, BA; Gary Willyerd, DO; Katelyn Phelps, DO; Lorenzo Lim, DO; Michael Wilk, BA; Reuben Kenny Briceno, MD; Sara Lang; Shane Sergent, DO; Taran Silva, BA

Michigan State University College of Osteopathic Medicine

For the past several years, Michigan State University College of Osteopathic Medicine (MSUCOM) has traveled to Peru promoting Osteopathic Principles and Practices (OPP) and Osteopathic Manipulative Medicine (OMM). Since 2012, presentations have been conducted at various medical schools with the hope of one day establishing an OPP curriculum in Peruvian medical education. Previous studies have demonstrated an interest in OMM and have shown to be successful at raising awareness in this field^{1,2,3}. This year MSUCOM conducted a workshop at Universidad Nacional Mayor de San Marcos in order to continue the effort in spreading osteopathic awareness.

This year's OPP workshop in Lima was again well received. From surveying attendees, most had little understanding of OPP initially, but were eager to learn about a treatment modality that helps restore homeostasis without the use of medication. Those in attendance participated in a lecture about OPP and then were separated in groups for interactive demonstrations. Various OMM techniques including myofascial release, muscle energy, and counterstrain were performed pending clinical presentation. These techniques were then taught to participants in hopes of promoting their implementation in clinical practice. After seeing the effectiveness and practicality of OMM, members of the medical student organization inquired about establishing future classes in OMM at the university. In addition, several wanted to know how to organize an OMM rotation with MSUCOM. They were intrigued with manual manipulation and its role as sole treatment and as an adjuvant to medical therapy for musculoskeletal abnormalities.

Overall, these outreach programs have shown that Peruvian healthcare professionals are very amenable to OPP and desire to use OMM in caring for their patients. This demonstrates the need for continual promotion of OPP and implementation of OMM training in Peru. Not only have Peruvian healthcare professionals shown interest in learning OMM, but patients who have received treatment have also expressed the desire to receive more treatment^{1,2,3}. OMM has proven to be a useful adjuvant to medical therapy and serves as a cost-effective skill for physicians to develop, especially in a country with limited resources. Teaching Peruvian physicians a method of treatment for musculoskeletal abnormalities that is sustainable and effective will only enhance comprehensive care for patients. Thus, it is extremely important to continue to share OPP and OMM internationally, with the hope of one day having OPP fully integrated into Peruvian medical education.

Abstract Title:

Assessing the correlation between water quality and Renal Function in the Peruvian Amazon

Abstract Number: 2016BIOM2499

Abstract Authors:

Emily Rachel Rozin, BS; Katelyn Phelps, DO; Shane Sergent, DO

Michigan State University College of Osteopathic Medicine Macomb University Center

The Amazon River is the primary drinking source for inhabitants of the Loreto region in Peru. Contamination of the river and limited public knowledge of proper water sanitation have directly led to an elevation of toxic elements. Previous studies conducted through Michigan State University College of Osteopathic Medicine have discovered high levels of heavy metals in the Amazon River basin. Other studies in urine in this region have discovered high levels of Malondialdehyde, a marker of oxidative stress which may affect the kidneys. This project is setting out to examine the correlation between water quality and renal function.

Surveys are being distributed to determine the primary source of drinking water, availability of drinking water, and knowledge of importance of quality drinking water. Blood and urine samples are also being collected to assess function via a point of care basic metabolic panel and dipstick urinalysis, respectively. Samples have so far been obtained from 75 patients. The project will focus on the amount of protein in urine and glomerular filtration rate (GFR) to help determine renal function. This data will be correlated with the results of the survey to help determine if there has been a direct impact on water toxins on renal function to this population.

The ultimate goal of the project is to distribute water filters to these communities to provide increased availability of clean drinking water. While it is possible that a variety of confounding factors are responsible for protein in the urine or increased GFR, providing evidence of improved kidney function following filter usage strengthens the water quality argument. If renal dysfunction is discovered, this will draw increased awareness to the direct health impact of environmental disparities on these populations. With this increased public health awareness, there can ideally be an increase in funding for incorporation of more water filters and patient education on the importance of clean water. Ultimately, this will lead to a significant improvement in quality of life the populations in the Loreto region.

Abstract Title:

Addressing the Health of Syrian Refugees in a Jordanian Refugee Camp

Abstract Number: 2016BIOM2498

Abstract Authors:

Hebatalla Osman, DO

Introduction: We often think of refugees who have escaped a war-torn country to have hit the jackpot by being granted asylum into a neighboring country or by being allowed into a refugee camp. However, that is often not the case. Refugee populations tend to have poorer health indicators than the communities from which they came from.

These individuals still have little to no access to medical care and cannot often afford the costs of medical care unless outside organizations come in to provide free health care. This often requires months of volunteers raising donations as well as physicians and medical students dedicating their time by volunteering. Refugee camps in Jordan now have different nongovernmental organizations that attempt to provide outpatient medical care and health education to camp residents all year round. As a result, refugees become completely reliant on foreign aid. That results in many patients not requiring continuous follow-up on various chronic health conditions, such as diabetes and hypertension, due to the continuous turnover of physicians and lack of medications available. Patients that required any form of imaging or testing for a proper diagnosis were often neglected due to the lack of medical equipment at the camp. Refugee camps have even greater barriers to health care than most other settings in developing countries because they tend to be remote, poorly accessible by road, and have a limited power supply, so even when a patient is allowed access to leave the camp to pursue additional care, it often becomes a financial burden to obtain that additional care.

Materials and Methods: During our 8 day medical mission, a group of volunteers had the opportunity to observe, assist and translate for with various components of a health care system: health professionals, infrastructure, government and community. We accompanied physicians from the Syrian American Medical Society as they treated Syrian refugees in outpatient clinics and Refugee camps, mainly Al-Zaatari Refugee Camp. As a first year medical student, I assisted physicians by taking the patient's health history and basic vital signs, as well as translating for non-Arabic speaking physicians.

Discussion: To illustrate my point, I will describe a situation I witnessed on my last day at the refugee camp when I met a mother and two sons. The children both looked frail and had a hard time walking. The neurologist I was working with diagnosed them with Duchenne Muscular Dystrophy, a rare genetic disorder that causes progressive muscle degeneration. After 4 years of visits to various foreign physicians at the camp she finally received a diagnosis. They required spinal cord surgery and continuous physical rehabilitation, both of which were not available at the camp. The doctor turned to the mother, explained their condition and advised her not to get pregnant again. That was when she broke down crying and told us she was currently pregnant. Not only was she not able to leave the camp to provide her children with the care they needed but she was also

burdened with the fact that her next child might have the same condition and there was absolutely nothing she could do about it. This is just one heartbreaking situation I witnessed while at Al-Zaatari refugee camp. This was only representing a fraction of what the residents there had to endure.

I distinctly remember the moment I felt most helpless. It was when we told a patient to get an MRI scan that was essential to arrive to a diagnosis. The patient returned asking us if the MRI was necessary since it couldn't be done at the camp. He told us it would cost him 150 dinars, approximately US\$210. To get the scan, he would need to receive permission to leave the camp and sell the coupons that he receives every month for food at a loss to gather enough money for transportation to the closest medical center. To the patient, that scan wasn't as important as being able to feed his children that month.

Conclusion: My experience has allowed me to witness the aftermath of the Syrian conflict and the desperate need refugees have for both physical and psychological support. Those in Al Zaatari Camp suffer both chronic and acute conditions such as: diabetes, hypertension, viral and bacterial infections, burns and fractures. They also have increasing needs for preventive health services, reproductive health, hygiene and mental health needs. All of these issues were not addressed with efficiency that is needed due to the location of the camp and the structure of the health services provided.

Abstract Title:

Role of water quality in Helicobacter pylori infection amongst Peruvian populations and its implication in gastrointestinal cancer

Abstract Number: 2016BIOM2494

Abstract Authors:

Brett Etchebarne, PhD; Gary Willeyerd, DO; Justin McCormick, PhD; Katelyn Phelps, DO; Ruben Kenny Briceno, MD; Santiago Benites, ScD; Shane Sergent, DO; Yang (Jenny) Song, BSc

International Outreach Michigan State University College of Osteopathic Medicine

Studies have found that Helicobacter pylori, the causative agent of gastric and duodenal ulcers, can survive in drinking water without previous treatment and may be correlated with the development of gastrointestinal (GI) cancer. In Peru, drinking water is often taken directly from untreated sources, increasing the risk of ingestion of waterborne pathogens. H. pylori is transmitted through the oral-fecal route and is becoming increasingly resistant to conventional antibiotic therapies. Therefore, prevention of infection is preferable to treatment. This study aims to delineate the role of drinking water in H. pylori infection and the implication of H. pylori in GI cancer. The project is currently in its preliminary stage; collecting water and GI tissue biopsies from patients and shipping them into

the United States to be screened for H. pylori infection. Assays to quantify the bacterial DNA in the water (i.e. PCR) and histological screening of the GI tissue samples will be performed. If tissue from the biopsies are found to be positive for H. pylori infection, the samples will be traced back to the source, and endoscopies will be performed on the patients to screen for GI cancer. Increased public awareness and implementation of safety measures are two methods for prevention of H. pylori infection. Knowledge of the mechanisms obtained from this project will enable more education for the municipalities and the public in terms of which water sources are safe to drink, when to issue warning alerts, how/why to sufficiently clear the water of bacteria, and regular screenings for H. pylori infection via rapid tests. Earlier and more effective treatment can be implemented if infection is detected and can hopefully prevent progression to gastrointestinal cancer. By engaging in clinical investigation, more targeted interventions that meet the needs and wants of the community will be designed and partnerships with existing infrastructures will be established so to ensure the continuity of the interventions, enhancing long-term standards of care. Gaining a clearer understanding of H. pylori reservoirs and mode of transmission is essential to developing public health measures to control future infections and enhance medical procedures to interfere with transmission vehicles (oral-oral, oral-fecal, or common environmental sources such as water supply) and eliminate its reservoir in humans (oral cavity, stomach, and small intestines), reducing instances of GI cancer. This will, in turn, prompt implementation of better water sanitation measures via enhanced water filtration systems, inspection and surveillance by municipalities, and improved hygiene and health screenings of the population.

Abstract Title:

Inter-Professional Approach to DOCARE Health Outreach

Abstract Number: 2016BIOM2492

Abstract Authors:

Alexander Joseph Pinter, MPH; Ashley Nichole Youngs, MS; Caitlin Marie Chapman, MS; Chelsea Rebecca Yap, BS; Elizabeth Keating Long, MS; Nikita Vinod Patel, BS; Ryan Scott Nelson, BS

Lake Erie College of Osteopathic Medicine – Bradenton

INTRODUCTION: Nicaragua is one of many countries that depends on assistance from other nations in the form of healthcare. With a population of eight thousand people and limited access to healthcare, medical outreach trips are beneficial to the medically underserved area of Chacraseca. Our vision for this medical outreach trip was to have Lake Erie College of Osteopathic Medicine Bradenton and School of Pharmacy unite with the State College of Florida RN to BSN Nursing Program to offer higher quality care to Chacraseca.

METHODS: The DOCARE team worked with Just Hope who provided transportation and interpreters. All of the supplies were transported with the team to Nicaragua. We visited ten

locations over five days, including home visits. In addition to the medical care, the patients were encouraged to participate in public health demonstrations. When applicable, we performed osteopathic manipulative techniques (OMT) and each patient was able to learn the techniques from a trained medical student with the supervision of an attending osteopathic physician. While waiting, a DO/BSN student team spent time with each patient and their families to discuss public health issues. The public health outreach portion of our trip allowed our medical team to educate the patients and foster a secure patient-provider relationship.

DATA: We treated 856 patients, dispensed over 2,000 prescriptions, and taught patients about the importance of public health and how to manage musculoskeletal pain.

RESULTS: Compared to previous years, the patients spent more time being seen by the medical staff. OMT was used when indicated and most patients had a notable decrease in pain upon manipulation.

CONCLUSIONS: An interdisciplinary team of healthcare professionals and students allows for greater diversity and quality of care during an international medical outreach trip. The patients developed more trusting relationships with experienced providers. The osteopathic approach to medicine offered a unique form of treatment due to the physically demanding jobs of our target population. As a team we taught the patients how to perform techniques to manage chronic pain. Along with OMT, the public health demonstrations awarded patients with the knowledge of how to maintain a healthy lifestyle. As a team, our greatest goals are to ensure continuing care for the patients and families we treated while implementing interprofessional collaboration in future medical outreach trips.

Abstract Title:

Establishing a Zika Education Program in the Urban Setting of Tegucigalpa, Honduras

Abstract Number: 2016BIOM2491

Abstract Authors:

Kurt Barger, BS; Daniel Krautter, BS; Jeremy White, DO, PhD

Edward Via Virginia College of Osteopathic Medicine

Introduction:

Zika virus outbreaks are currently occurring throughout the Americas, prompting the Centers for Disease Control and Prevention (CDC), World Health Organization (WHO), and Pan American Health Organization (PAHO) to aggressively combat the disease and educate at-risk populations in this global pandemic.

The Edward Via College of Osteopathic Medicine has adapted written and audio-visual Zika education materials originally created by the CDC and PAHO for use at all their international sites. This retrospective study describes a Zika education campaign implemented at the Baxter Institute medical clinic in the densely populated urban setting of Tegucigalpa, Honduras.

Material and Methods:

Beginning on July 3rd, 2016 two Zika education pamphlets were provided to each patient visiting the Baxter Institute general medical clinic. One pamphlet discussed general signs and symptoms of infection, at-risk populations, and prevention recommendations, while the other focuses on limiting the spread of Zika virus through sexual contact.

In addition to the dissemination of written educational materials, a PAHO-developed Zika prevention multimedia presentation was displayed on a continuous loop on a waiting room monitor. All patients waiting to be seen had the opportunity to view the presentation at least once prior to their physician encounter. All materials were then discussed during the physician encounter to ensure patient comprehension.

The following demographics are being recorded while the program remains active: gender, age, income level, marital status, occupation, and pregnancy status.

Results:

From the period of July 3rd to 10th, 2016, a total of 109 patients were provided Zika education materials before and during their physician encounters. The demographics of this patient population include: 34 males, 76 females, 109 adults, 50 married patients, 59 single patients, 32 middle class patients, 78 poor patients, and 2 pregnant females.

Since its initiation, this program remains active and available to all patients seen at the Baxter Institute medical clinic.

Conclusion:

The Zika pandemic continues to spread across the Americas, prompting a multi-country eradication strategy. This study describes one such program, targeting an urban general clinic patient population in Tegucigalpa, Honduras. Using both written and audio-visual materials, an ongoing patient education program was put into place during a VCOM international medical outreach trip beginning July 3rd, 2016. Using the results of its first week of implementation, it is estimated that over 5,720 Hondurans will receive Zika education and prevention materials in the next 12 months that would not otherwise be available due to their limited access and low socioeconomic status. The intended outcome of this program is a reduction in morbidity and mortality caused by Zika virus and its secondary sequelae.

Abstract Title:

Targeted Zika Education and Medical Outreach in Rural Villages Surrounding Tegucigalpa, Honduras

Abstract Number: 2016BIOM2490

Abstract Authors:

Kurt Barger, BS; Daniel Krautter, BS; Jeremy White, DO, PhD

Edward Via Virginia College of Osteopathic Medicine

Introduction:

According to the World Health Organization, as of May 2016, 60 countries report continuing mosquito-borne transmission of Zika virus. One of the epicenters of this pandemic is Central America, making it an important target for Zika prevention and eradication efforts. Because many of these populations live in rural settings with limited, or no, access to health education and care, it is important to develop outreach programs that include these vulnerable groups.

One such program, described here, provided Zika education to patients residing in multiple rural villages situated in the mountains surrounding Tegucigalpa, Honduras. The program was completed as part of an international medical outreach mission by the Edward Via College of Osteopathic Medicine. The goal was to reach multiple at-risk populations with various geographic and socioeconomic barriers in an effort to slow or stop the spread of the Zika virus pandemic.

Materials and Methods:

Twelve medical students and six physicians participated in five clinics set up to provide free medical care to all inhabitants of the following villages near Tegucigalpa, Honduras between July 3rd and 10th, 2016: Campamento, Cantarranas, El Diamante, El Vino, and Guajire.

To incorporate a Zika education program into the medical outreach clinics, two Zika education pamphlets were adapted from materials originally created by the Centers for Disease Control and Prevention and Pan American Health Organization. One pamphlet contains details about infection signs and symptoms, at-risk populations, and prevention recommendations, while the other focuses on limiting the spread of Zika virus through sexual contact. Both pamphlets were printed in the Spanish language.

All participating medical providers were briefed on the contents included in the pamphlets and instructed to review them with each patient seen at the clinics. These materials were then disseminated and discussed with each patient during their physician encounters. The following

statistics were recorded at each site: total patients, males, females, adults, children, and pregnant women.

Results:

A total of 470 subjects were included in the Zika education program described above, including 79 at Campamento, 91 at Cantarranas, 98 at El Diamante, 101 at El Vino, and 101 at Guajire. This total included 289 females, 181 males, 211 adults, 259 children and 4 pregnant females. A total of 940 Zika education pamphlets were disseminated to the villages during the period from July 3rd to 10th, 2016.

Conclusions:

During the week of July 3rd to 10th, 2016, VCOM physicians and students educated 470 at-risk patients on Zika virus disease and prevention who otherwise would have had no access to such interventions. VCOM will return in October, 2016, to continue and expand this outreach program with the overall goal of helping limit the spread of Zika virus throughout the Americas.

Abstract Title:

Governmental Unrest and Natural Disasters Contributing to the Lack of Healthcare Resources in the Midst of Sexual Violence and Zika!

Abstract Number: 2016BIOM2488

Abstract Authors:

Drew English; Kathryn Cooper, MS; Steven Gustafson, DO

William Carey University College of Osteopathic Medicine

Background: The people of Honduras have faced years of political and economic instability, affecting the quality of healthcare and disease control. Physician strikes for higher pay further decrease a physician density that has averaged 5.7 per 10,000 people from 2000-2010, increasing the long distances patients must travel for care. Natural disasters have destroyed infrastructure; shortages of clean water and sanitation further complicate public health efforts. The industriousness of some to build personal collecting basins has created a breeding ground for *Aedes aegypti* mosquitos. Governmental unrest has led to increased criminal activity in Honduras. The lack of available healthcare, ban of emergency contraceptives in conjunction with increased sexual abuse and Zika infections is a cause of great concern.

Description: I had the opportunity to volunteer with a Hattiesburg, Mississippi church, in San Matias, Honduras. Out team consisted of a Registered Nurse, non-medical volunteers, translators

and six physicians. We evaluated 2,320 patients and wrote 10,397 prescriptions during our three and a half days. Under physician supervision, I performed history and physical exams with limited medical equipment. Common diagnoses included Zika, Chikungunya, allergies, UTIs, parasites, and anemia. Common diagnoses in men were muscle and joint pain secondary working conditions. Diagnoses in women included vaginal yeast infections, bacterial vaginitis, and pregnancy. Women and pediatric patients commonly reported injuries, infections, and psychological issues resulting from domestic and sexual abuse. In addition to medications, I provided sexual health education, counseling for abuse victims, and Osteopathic manipulative treatment.

Discussion: Although these are common themes in resource poor countries, the combination of natural disasters and governmental unrest has had a significant impact on available health care resources leading to increased morbidity and mortality. In addition, sexual violence and the emergence of the Zika virus has negatively affected the quality of life in Honduras. Because of limited health care facilities, the introduction and use of Osteopathic manipulative methods where appropriate, could improve the quality of life for some.

Abstract Title:

Development of Interpersonal and Communication Skills through International Missions

Abstract Number: 2016BIOM2486

Abstract Authors:

Lisa Bourbeau, OMS-II

A.T. Still University, School of Osteopathic Medicine in Arizona

Introduction:

Dr. Diane Foley and her husband Dr. Steve Foley first traveled to Haiti with a medical team in 1989. Over the years they have returned to the island of La Gonave bringing medical relief to the people of Haiti. In June, I joined the Foleys on one of their medical missions, to explore my interest in international medicine and contribute to the health of women and children in Haiti.

Summary

Over the ten-day trip, I was given the opportunity to rotate through various clinical settings surrounding pediatrics and women's health. This included time with the ultrasound technician examining women with OB/GYN complaints and taking histories of patients presenting with everything from abnormal menstrual bleeding to abdominal discomfort.

Each of these clinical settings was unique and offered a total of 40-50 hours of unparalleled experiences in note-taking, physical examinations and the use of invaluable communication skills. My most pivotal experience included the supervision of a woman with preeclampsia. My role was to routinely record her blood pressure and monitor the timing of her contractions. Each time I entered the room I could see she fearfully anticipated the news I was potentially bringing. I would instinctually start to tell her everything was okay until I realized my words meant nothing to her without a translator. Due to the language barrier it was critical that I use my facial expression, body language and tone of voice to communicate compassion and reassurance.

Conclusion

Through multiple patient interactions, this trip gave me the ability to communicate in a variety of unfamiliar circumstances; circumstances that cannot be afforded in the classroom. This medical outreach program significantly contributed to the development of my interpersonal and communication skills, and equipped me with the ability to relate to patients regardless of background, language barriers and cultural differences. I will use these skills to ensure each of my future patients is truly heard, supported and understood. Communicating and empathizing with patients, even sometimes without words, is an essential skill for the success of an osteopathic physician. Medical mission trips are an unparalleled opportunity for medical students to learn and develop these skills.

Abstract Title:

International Medical Outreach: Osteopathic Medical Students Efforts to Close the HealthCare Gap through Continuity of Care

Abstract Number: 2016BIOM2484

Abstract Authors:

Anthony Silvagni, DO, PharmD, MS; Claudia Vallin, OMS-III; Estefania Niewialkouski, OMS-III ; Jorge Benito, OMS-III; Loan Le, OMS-III; Michael Yurubi, OMS-III; Romeena Lee, OMS-III, MPH; Taleb El-Masri, OMS-III

Nova Southeastern University College of Osteopathic Medicine

Introduction: Outreach programs in the United States have been established to provide better care to underserved groups by using an interprofessional approach to reach the community and to increase the availability of medical care to those in need. This model of care provides the continuity of care that is often lacking in international medical outreach trips. While many medical schools, including Nova Southeastern University - College of Osteopathic Medicine (NSU-COM), have

established medical outreach trips, the length and frequency of these trips is often not enough and continuity of care is lost.

Description: One solution to improving the lack of continuity of care in these underserved regions is to develop an exchange program for medical students. To do so, a group of students would travel internationally to provide medical care in remote areas on a monthly basis. Currently, NSU-COM's curriculum includes a three-month rural selective and elective, where fourth year medical students are given the opportunity to select approved international rotation sites. In order to achieve continuity of care, students could potentially choose an underserved area in Ecuador as their rural site, potentially providing 12 months of continual care. Additionally, using Osteopathic Manipulative Medicine (OMM) abroad would tackle a variety of somatic and musculoskeletal illnesses frequently seen in rural Ecuador which would provide an invaluable therapeutic modality in areas where advanced imaging, diagnostic tests, and pharmacotherapeutic resources are scarce. This collaborative partnership would allow a greater exchange of knowledge between locals and medical students. Thus, medical students would gain a greater understanding of local social, economic, and medical issues, as well as provide education to local residents that would improve their healthcare system.

Conclusion: By building lasting relationships with local communities and medical schools, both internationally and domestically, medical care teams would satisfy the health care needs of the underserved on a monthly basis in an international setting. In doing so, medical students could provide the continuity of care that is often lacking in weeklong medical outreach trips or when transportation, resources, and health care access are meager. This would ensure that underprivileged communities in impoverished nations not only receive health benefits but also continuity of care. International and domestic healthcare should not be looked at as separate experiences, but rather as outreach medicine that works synergistically to encourage the enhancement of medical knowledge, cultural sensitivity, and social justice. Osteopathic medical students can then use these experiences and better the lives of those populations that would otherwise be neglected by circumstance.

Abstract Title:

ACOM's Newly Implemented Supply Drive and Fundraiser

Abstract Number: 2016BIOM2476

Abstract Authors:

Amanda Robinson, DO; Mark Hernandez, PhD; Mitali Mali, DO; Qurrat-ul-ain Aziz, DO

Alabama College of Osteopathic Medicine

Objective: Start a new program to raise supplies and monetary funds for future Osteopathic Medical Outreach trips involving ACOM students.

Method: Donation boxes were placed in religious centers such as churches, temples, and mosques as well as the ACOM campus. Committee members contacted local dentists in Dothan, AL requesting donations of toothbrush, toothpaste, and floss. An account was created to collect monetary funds online. Additional funds were raised through hosting a profit-share event with a local business. With the help of the Student Advocate Association, the Supply Drive Committee extended the drive to include local businesses.

Results: Donations amounted to about 6,300 medical supplies and over 1,500 dollars.

Discussion: Collected items were split between an ACOM-sponsored Medical Outreach Trip to Ecuador and an independent student group traveling to Jamaica. In Ecuador, supplies were divided for three different brigades based on the populations. Monetary donations were used to purchase three MAP Medical Mission Pack Essential boxes and food supplies to distribute to brigade patients in Ecuador. Students who traveled to Jamaica utilized the majority of donated items unable to be transported to Ecuador and also brought a MAP Medical Mission Pack Essential box. In Jamaica, supplies were split into two groups for each of the four clinic days. For future trips, members should start the supply drive earlier and expand the fundraiser to more groups. Additionally, all supplies should be packed and ready for shipment before the end of school allowing for more timely sorting and distribution. The creation of a new position is necessary for the ACOM Global Public Health group to help organize future fundraisers and coordinate a team dedicated to the supply drive.

Conclusion: Without the fundraiser, the brigades would have provided lower quality care to patients. Donations from the Medical Outreach Drive allowed the local and international physicians who participated as well as the medical students to make the biggest impact. Both trips found a constant need for more supplies. Necessary medications and food supplies were supplemented with the collected donations. Extra supplies at the end of the brigades were donated to the local organizations to be distributed in future medical brigades.

Abstract Title:

A Comparison of Underserved Populations in Ecuador

Abstract Number: 2016BIOM2475

Abstract Authors:

Hunter Roark, DO; Jeffrey Lull, DO; Juan Felipe Alarcon, MD; Rebecca Marie Arneson, DO

Alabama College of Osteopathic Medicine

Introduction: Ecuador's high prevalence of poverty and income inequality greatly affects its indigenous and rural populations. While the government has made increases in social spending and requires Ecuadorian physicians to serve rural locations for a time after medical school, many areas are still considered medically underserved. In July of 2016, eleven students and two professors from the Alabama College of Osteopathic Medicine traveled to Ecuador to assist local physicians with brigades aimed at providing multidimensional medical care to underserved areas. The populations of the three locations served were vastly different and each had individual needs for improvement of medical care.

Methods/Summary: The brigades were organized by Dr. Juan Felipe Alarcón MD in the towns of Peñaherrera, Valle del Chota, and Otavalo. Donations from an ACOM student-organized supply drive were divided to provide adequate supplies at each location. Monetary donations were used to purchase food for local families with the remainder going toward medical equipment for future brigades. Students assisted the local physicians by registering patients, taking vitals, and organizing the pharmacy, as well as performing osteopathic manipulation as indicated under the supervision of Dr. Kevin Hayes DO. As physicians examined patients, students shadowed and learned more about which diagnoses are commonly seen in each geographical area as well as how to best orient medical aid and treatments.

Results/Conclusion: In Peñaherrera, 92 patients were seen during the brigade, most for adult or child wellness exams and urinary tract infections. This town was the most medically underserved of those we visited, as it is located in a remote mountain range and has no immediate access to a rural physician. 65 patients were treated at the brigade in Valle del Chota with the most common diagnoses being nonspecific lumbago, urogenital *Trichomoniasis* infections, and intestinal parasites. This population has some access to medical care, but parasitic infections are commonly acquired from the Chota River and patients need to be seen frequently. The brigade in the city of Otavala serviced 77 patients mainly seen for the common cold, joint pain, and nonspecific lumbago. While this population has access to a hospital, it still holds a large number of underserved elderly or homeless patients.

Abstract Title:

Common Medical Complaints of Patients in the Remote Areas of Northern India

Abstract Number: 2016BIOM2472

Abstract Authors:

Neeraj Khiyani, MD; pooja saraiya; Swati Avashia, MD

Lake Erie College of Osteopathic Medicine – Bradenton

Research Question: Medical outreach camps in Himalayan villages offer aid to medically underserved populations. We investigated the types of chief complaints of patients presenting to these camps in hopes of better informing outreach programs and optimizing resources and care provided.

Research Method: Age, sex, and chief complaint was gathered from patients presenting to mobile outreach clinics in five rural Himalayan villages in Northern India. Local guides and school children acted as translators. Chief complaints were sorted into the following categories: eye pain, abdominal pain, musculoskeletal pain, headache, gynecologic complaint, upper respiratory infection, dermatologic complaint, ear pain, dental pain.

Data Analysis: Data were entered into Microsoft Excel. Frequencies of the major categories of chief complaints were calculated and specific complaints were then analyzed as a percentage of the total category count. Chief complaints were also stratified by age and gender.

Results: 640 patients were seen over nine days, 339 (53%) were male and 301 (47%) were female. Patients ages ranged from 6 months old to 86 years old, mean age was 31.7 ± 19.7 years. Eye pain was the chief complaint in 38.3% of patients followed by musculoskeletal pain (13.3%), abdominal pain (13.1%), headache (8.0%), upper respiratory infection (7.7%), and dermatological complaints (7.3%). Gynecological complaints, dental pain, ear pain and well visits comprised the remaining 12.1%. The majority of the patients with eye pain (61.2%) complained of dry eyes. Stratification by decade of life and gender revealed that eye pain was still the most common complaint in each group except for in the first decade of life where upper respiratory tract infections were the most common.

Conclusions: Eye pain and MSK pain were the most frequent reasons villagers sought care at the medical camps. Data about medical exam and diagnosis is needed to further understand the nature of these complaints. Furthermore, chief complaints may have been biased by services provided at prior medical camps to the area and by limitations in language translation. Outreach clinics traveling to this area of India should provide public health education targeted at eye and musculoskeletal conditions and stock medications to treat these maladies.

Abstract Title:

KYCOM Students' Osteopathic Outreach in Valladolid, Mexico

Abstract Number: 2016BIOM2469

Abstract Authors:

Angelica Yun, BS; Christopher Yun, BS; Johanna Yun, BS; Shandilya Ramdas, BS

Pikeville College School of Osteopathic Medicine

In the blistering heat of the Yucatan Peninsula, eleven students from the Kentucky College of Osteopathic Medicine participated in a mission trip to Valladolid, Mexico. Our focus was to not only implement and spread the osteopathic principles that we had learned in school, but to tend to the needs of anyone needing proper medical attention regardless of race, religion, and cultural

identity. Joined together with healthcare providers from the United States and Mexico, we worked together as a team to serve the neglected Mayan population in Valladolid. Our team consisted of 3 surgeons, an anesthesiologist, 3 CRNAs, physicians and dentists from Mexico, medical, undergraduate, and high school students. Our base of operations was at the *Centro Medico San Lucas* surgical clinic in Valladolid, Mexico and from there we were able to reach out to surrounding villages to assist those who were not able to travel to the clinic. In our time there, we participated in patient consultations, assisted in surgical procedures, post-operative care, village clinics, and osteopathic manipulation. During the 6 days, we saw 283 patients in the villages and 100 patient consultations at the clinic. Apart from performing vitals and assisting physicians in their physical examinations, we filled 374 prescriptions and distributed 362 pairs of reading eye-glasses. Among the 283 patients who were examined in the villages, 60 were referred to the clinic for further evaluation. The dental team performed 47 tooth extractions and 34 fluoride treatments. At the surgery center, we assisted in a total of 60 surgeries which included hernia repairs, cholecystectomies, cleft palate repairs, and other reconstructive surgeries. Apart from providing care to an extremely neglected community, we were successful in implementing the most important osteopathic principle- *the person is a unit of body, mind, and spirit*. Our interactions with patients, children, and the community, allowed us to experience medicine in its truest form. We witnessed that love and compassion are languages that every human being in the world can understand. When we began, our goal was to try and have an insurmountable impact on those we cared for so that they may benefit the most. However, it was we who benefitted more as we learned about the true meaning of compassionate medicine. Only when we are able to see a patient for more than what is written in a chart, can we then start treating them as a whole and the person within.

Abstract Title:

Unique Teaching Opportunity for Osteopathic Medical Students Through Collaboration with Undergraduate Premedical Students During International Medical Outreach

Abstract Number: 2016BIOM2462

Abstract Authors:

Chandni Bheeman, OMS; Paola Velandia, OMS; Yinglin Gao, OMS

Touro College of Osteopathic Medicine

Objective: Collaborate with pre-medical students to create a unique teaching opportunity while providing healthcare to underserved villages in Esteli, Nicaragua.

Hypothesis: The authors hypothesize that by adding a teaching component to the international mission trip through collaboration with pre-medical student, it enables osteopathic medical students to gain communication skills, establish mentorship, and promote osteopathic profession.

Method: A total of 14 medical students and 28 undergraduate pre-medical students from Touro College of Osteopathic Medicine, Middletown and CUNY-Brooklyn College, worked closely together to provide free healthcare and water maintenance infrastructure to villages in Esteli, Nicaragua. Both schools organized the logistics and collected medication donations for the underserved population of Esteli, Nicaragua. Under the supervision of local physicians, osteopathic medical students provided preventative medicine and health screenings, including blood pressure measurements and wellness check-ups by setting up multiple stations for patients to visit. These stations included triage, family medicine, dentistry, gynecology, an education center, and a pharmacy. Additionally, the students helped the local workers build a safe water infrastructure by laying down pipes for clean water. The osteopathic medical students also spent after-hours answering questions about osteopathic medicine and demonstrating osteopathic manipulative medicine for the pre-medical students.

Result: Approximately 700 patients from 3 different villages were treated during the 3-day free clinic and over 70 households in La Corneta, Esteli were potentially benefited using the new water infrastructure system. During this time, the osteopathic medical students mentored the pre-medical students by teaching them various skills such as confidently obtaining a proper medical history and utilizing diagnostic equipment, such as the sphygmomanometer. It was evident that the pre-med students were able to utilize their new skills when many of them took the initiative to measure blood pressures on their own in the following days. Additionally, they took this opportunity to educate and promote osteopathic medicine to the undergraduate student which resulted in an increased interest in the field.

Conclusion: The teaching opportunity was beneficial for all students. The medical students gained confidence in the skills they learned during their pre-clinical years. They also establish mentorship and communication skill through teaching. On the other hand, the pre-medical students gained valuable knowledge about osteopathic medicine from the perspective of fellow peers. The teaching component certainly adds a valuable dimension to medical outreach trips and moreover, provides an opportunity for enriching osteopathic medical education.

Abstract Title:

Partnering4Africa: A Student Established Non-Profit Organization that Provides Healthcare to Lugala, Uganda

Abstract Number: 2016BIOM2460

Abstract Authors:

Megan Battin, OMS-IV; Todd Troxell, OMS-IV

PROJECT DESCRIPTION

Lugala, Uganda is home to 26,000 individuals who live under one dollar per day. Healthcare is only accessible to those who have the time and money to be transported to the nearest hospital two hours away. This leads to death from preventable diseases such as malaria, diarrhea, pneumonia, typhoid, and giving birth. Partnering4Africa (P4A), a Non-Profit Organization, was established in order to provide such an indigenous population with healthcare. The creation of a Board of Directors both locally and in Uganda was the first step in obtaining 501(c)3 status. Non-Profit status allows P4A the capability to apply for grants and host fundraisers only applicable to those with a 501(c)3. This funding was used to build Lugala their first healthcare clinic. P4A continues to provide staff salaries, medical supplies, medications, technology advances and renovations each year. The clinic is now capable of diagnosing and treating over 250 patients per month. Also, the clinic runs three HIV/AIDS support groups, vaccine outreach program and family planning group facilitation. P4A's community involvement at the clinic continues to empower our friends in Lugala to take responsibility for their health. Partnering4Africa is unique because its founder, a student, was the youngest female to solely establish and receive non-profit status in New York State. Because of this, medical students continue to maintain the clinic and organize medical missions. These medical missions grant healthcare providers and medical students the opportunity to practice and learn medicine in Uganda. Furthermore, P4A believes that student ignited Non-Profit Organizations are vital and necessary to bring healthcare to poverty-stricken communities abroad.

OBJECTIVES

Partnering4Africa's sought to receive Non-Profit status in order to apply and compete for grants of substantial amounts. The funding was utilized to build a medical clinic for the poor community in Lugala, Uganda. Monetary donations and grants continue to support and grow the medical clinic. Funding is used to expand the level of care given, accept more patients, increase the amount of HIV/AIDS support groups, fund educational health programs, increase vaccine and medication stock, hire qualified staff members, and pay clinic salaries. In addition to receiving Non-Profit status, P4A was established to educate students in the United States about the medical poverty that exists abroad. Our initiative is to motivate medical students to travel abroad and provide medical support and empowerment to those in indigent communities.

METHODOLOGY

I first traveled to Uganda to gather information and conduct a needs assessment on the poorest community I ventured too. Here, I met a nurse in Lugala, Uganda who was the chosen leader of the community. Together, we surveyed the area to learn that a medical clinic was highly needed to care

for the people. Back in the states I placed fliers around my college campus and throughout the community. The fliers were targeted to gather together those interested in starting an on-campus organization whose mission was to raise awareness about the poverty in Africa. Instantly, I had many people join the group and together we created the organization, Partnering4Africa (P4A). Once we were established as an organization, a board of directors was formed. The board met monthly to plan events targeted at raising awareness about the healthcare needs in Uganda. Together we contacted the nurse in Lugala to discuss creating a second board of directors in Uganda. She easily gained community involvement and establish a board to work hand in hand with us in the US. Both boards assessed the needs once again in Lugala. We decided that the greatest need was a medical clinic. Thus, our greatest efforts went into raising money for a clinic.

Next, we created our mission statement: To empower our friends in Africa by helping them become self-sustainable in the areas of health, education, water and agriculture. It is our hope that we can provide them with opportunities for a better tomorrow.

While Partnering4Africa was budding to life, I began sending emails to dozens of local law firms in Buffalo, NY inquiring about the potential to gain Non-Profit status. Eventually, I found a law firm trained in filing for a 501(c)3. Together, we met monthly for approximately eight months. I then filed for the Certificate of Incorporation with New York State. After this, I completed documentation of a 1023. Next, I formatted The Incorporation and Bylaws of Partnering4Africa. These documents were drafted and reviewed multiple times by both partisans. Once the documentation was complete it was signed by an attorney officer and submitted to the IRS. The IRS reviewed all the documentation and Non-Profit Status was granted to Partnering4Africa.

Once Non-Profit status was received P4A began to engage the community through multiple events. Fundraisers were held every three months which included silent auctions, t-shirt sales, sporting events, and formal dances. Each month students traveled to one of the 15 Rotary Club's to speak about the poverty in Africa. We made efforts to speak at the local medical schools, business schools and art schools. Within a year we raised enough money to build a medical clinic in Lugala.

Together the organization traveled to Lugala, Uganda for 3 weeks to build the medical clinic from the ground up. We constructed a 4 room clinic: administration, laboratory, pharmacy and patient care room. We also built a pit latrine, water well and chicken farm on clinic grounds. Four guest homes were constructed to house students who visit the clinic for all years to come.

Once we returned from the trip we began to focus our efforts on making the clinic self-sustainable. We regularly apply grants and host fundraisers to further these efforts. We are geared at sustaining and expanding the clinic for all years to come. Current initiatives are to expand the level of care given, accept more patients, increase the amount of HIV/AIDS support groups, fund educational

health programs, increase vaccine and medication stock, hire qualified staff members, and pay clinic salaries.

PRESENTERS' ROLE

Megan Battin is a third year medical student at Kansas City University of Osteopathic Medicine. She founded Partnering4Africa as an undergraduate at the University of Rochester in 2010. Each month she leads board meetings to gauge the current status and progress P4A is making. Together with the board she analyzes the clinics monthly report containing information on how many patients are being seen and what diseases are prevalent. She continues to speak at local events in the community and raise awareness about P4A's efforts. Megan organizes the donation of medical supplies and pharmaceuticals to be shipped to the P4A clinic. As a medical student she gears her efforts into advocating for medical students and medical professionals to travel to P4A's clinic to provide medical relief and osteopathic manipulative medicine. Routinely she applies for grants that go toward making the clinic self-sustainable.

Todd Troxell is a third year medical student at A.T. Still University of Osteopathic Medicine. Along with Megan Battin, he helps to analyze clinic data to ensure it is adequately progressing. Todd organizes local fundraisers and awareness events in the local community and on campus.

RESULTS/EVALUATION

The original P4A team that was recruited was 6 members, just enough to create a board of directors. Over the course of three months the organization grew to 13 members. Word of mouth, general interest, and fundraisers facilitated the growth of the organization.

Prior to receiving Non-Profit status P4A funded project solely on private donations and fundraisers. We raised awareness by traveling and speaking to high schools and middle schools students in the local Rochester and Buffalo community. It was not until granted 501(c)3 status that P4A grew enough to make their medical clinic self sustainable. We were awarded larger grants from organizations such as Rotary International and Innocent Eyes ,which expedited the establishment of the P4A clinic.

Challenges were tackled along the way, one being communication between P4A Uganda and P4A US board members. Communication on a regular basis faces obstacles secondary to the time difference, cost, language barrier, and access to Internet. This problem was fixed by having each board hosting individual board meetings. Then each board sends a monthly newsletter update to one another.

Another challenge was not having enough time to spend in Uganda to facilitate growth of the clinic. We feel that being on the ground with the community we are working with is vital to maintain trust between two parties. Thus, we recruited Bob Schooley to be P4A's Field Director. His role is to

travel to Uganda twice per year for a minimum of two weeks at a time (usually 1-2 months). He oversees the community growth, oversees the bookkeeping and finances, conducts a brief updated needs assessment, stocks the pharmacy, and maintains our friendship with our African friends. Often he is able to begin new projects such as planting a tomato farm to raise money for HIV medications.

Although Bob is able to oversee the clinic a few months per year, we still were uncertain as to how it was growing without the presence of a US board member. To solve this problem we created a spreadsheet that is filled out on a monthly basis by nurse Clementina Awino- President of P4A Uganda Committee. This spreadsheet updates us on the top ten-presented disease to the clinic each month. It also tells us how many lab tests were run, and for what reason. This data guides how much medication should be stocked each month, what diseases are more prevalent in summer vs. winter, and what other lab equipment we should invest into.

The growth has been dramatic to say the least at the P4A clinic. Last winter the clinic was lucky to see three patients per day. With Bob's oversight, Clementina's leadership, spreadsheet documentation, and the hiring of more staff, P4A now sees over 250 patients per month. Patients no longer are dying from not having access to vaccines or inability to afford anti-retroviral medication. Children do not have to suffer through weeks of diarrhea, bouts of malaria or typhoid. The greatest reward of all is the growth of the community. With health comes happiness and with happiness comes the ability to dream and grow as an individual and a community. We are proud and blessed to watch Lugala develop.

CONCLUSION

Impoverished communities with no access to healthcare are far too prevalent and this situation must be addressed. Students may feel helpless in their efforts to change the things they wish not to see- such as medical deprivation. Often, they wait to become residents or attending's before they feel they can create an impact on any one such community. However, by establishing themselves as a Non-Profit organization, students can be the difference they wish to see in this world. NPO's are able to apply for grants, raise awareness and fundraise at a higher level than the average organization. Because of this, P4A's establishment has brought healthcare to a community of 26,000 people who otherwise would never have access or financial stability to receive healthcare. The clinic is able to support HIV/AIDS support groups, vaccination outreach programs and family planning sessions. All of these are vital to the development of a healthy and happy community.

Abstract Title:

Exploring the medical application of an osteopathic manipulative treatment along with popular

alternative medicine treatments of musculoskeletal system and visceral organs in Shymkent, Kazakhstan.

Abstract Number: 2016BIOM2458

Abstract Authors:

Aleksandra Pivovarova, DO

Alabama College of Osteopathic Medicine

Introduction: Osteopathy originated in America but its influence has spread throughout the world; however, the techniques, and the reliable sources of information available to osteopathy practicing physicians vary in different parts of the world. Hence, diagnostic work-up and treatments given for common chief complaints may differ from one country to another. Shymkent is a humble city, so the average patient cannot afford traditional pharmaceuticals as readily as their American counterparts, in which case a use of manual medicine greatly improves the quality of care. In Kazakhstan, there are no osteopathic medical schools available to provide the foundation necessary to properly administer osteopathic techniques; still, culture dictates that similar techniques may be employed. Due to the absence of D.O. schools, the physicians who chose to practice osteopathy in Shymkent use the available resources to acquire osteopathic knowledge. A trip to Shymkent, Kazakhstan, and observation of a local physician allowed to determine the most commonly used osteopathic techniques, the means of learning about new osteopathic treatments in the absence of osteopathic schools, and other frequently used manual therapy methods.

Method: Diagnostic workup and treatment protocol was thoroughly reviewed. Observation of the most frequently used osteopathic techniques was utilized to evaluate the occurrence of OMM techniques and their reasonable, similar methods. Alternative medicinal tools and techniques were also noted. The sources available to local physicians to study and improve their osteopathic skills were evaluated. All of these results were obtained via a firsthand, observational basis. Additional practices and physicians would need to be observed to determine a more accurate correlation between the choice of osteopathic techniques and the sources available to local physicians in studying and improving their osteopathic skills. All of the observation were performed in a local clinic in Shymkent, Kazakhstan.

Results: During a three-week observation period it was determined that cranio-sacral technique was one of the most popular osteopathic tools employed to treat somatic dysfunction. Some of the additional approaches practiced were alternative medicine methods which included acupuncture, cupping, applied kinesiology and visceral chiropractic. The cranio-sacral technique was the first line of treatment due to its efficacy shown by years of clinical experience, and resources available to study this technique in the form of popular online webinars, by doctor of osteopathy, Russian professor Konstantin Sharapov. The knowledge used to perform visceral chiropractic techniques

was acquired through Dr. Ogylov's books and webinars. Lastly, information and teaching seminars of applied kinesiology are created by doctor Ludmila Vasilieva, M.D.

Conclusion: The opportunity to observe physicians working in the clinic allowed me to experience new ways of treatment, and to identify what methods are given preference in a practice with limited resources. Although techniques such as acupuncture, cupping, visceral chiropractic are used in addition to osteopathic manipulations, osteopathy is the main treatment used to alleviate somatic dysfunctions. Visceral chiropractic method was used to relieve spasm and pain due to colon inflammation. This technique is also applied to Crohn's disease patients, patients during a post operative period when it is considered safe, and patients with constipation, spasm, etc. Applied kinesiology was used as an additional diagnostic tool in patients with increased pain, and access weight. Cupping, and acupuncture were mainly used to alleviate dysfunctions caused by muscle spasm. The practice of osteopathy gives an advantage in diagnosis and treatment. In a clinic with limited resources where the only form of imaging available is an ultrasound, the palpatory skills of a well trained osteopath are especially valuable. Although the sources of information available to osteopathy practicing physicians in Kazakhstan are quite reliable, the searches for scientific data are uncommon. The evaluation of scientific data, its validity, and transformation of this data into practical solutions are important for health care workers in a clinical setting all over the world, and should be emphasized and promoted. Overall, this brief international experience indicates a need for osteopathic schools in other countries, such countries may also be used as comparison models for research based on contrasting a country with ready access to osteopathic education (such as the U.S.) to their counterparts.

Abstract Title:

Healthcare Delivery in a Unique Geopolitical Context: Reflections on a Rotation at Children's Hospital, Brno, Czech Republic

Abstract Number: 2016BIOM2457

Abstract Authors:

Lukas Martincik, OMS-IV; Lukas J Martincik, DO

Western University of Health Sciences College of Osteopathic Medicine of the Pacific

Methods/Summary: The Czech Republic is a central European country with a complex history, uniquely situated in the political dynamic of Europe. My rotation was spent in 2 different departments of Masaryk University Children's Hospital, Brno. I spent the first half of my rotation working with the inpatient and outpatient physicians of the pediatric oncology department, and the second half was spent in an inpatient Neonatal Intensive Care Unit (NICU) setting. I observed a

variety of conditions, from leukemias and tumors to aortic coarctation and gastroschisis, as well as many others. As far as I could tell with my limited experience, the care provided is equivalent to the standard of care expected in the US.

Culturally and politically, however, there are striking differences. In contrast to the US, the Czech Republic's population is racially, culturally and religiously quite homogeneous. Another large group of differences stem from the fact that the Czech Republic has a universal healthcare system in place. Socialized medicine certainly has its advantages, but it comes with its own set of problems as well. As a European Union (EU) Member located centrally, the Czech Republic has geographic and political access to both more western members, such as Germany, as well as less economically developed countries not participating in the EU, such as Ukraine. This creates a situation in which there is a fair amount of westward travel across Czech borders for physicians. An urgent issue in Czech healthcare is the flight of many Czech physicians to nearby countries such as Germany, seeking higher pay.

Results/Conclusions: The four weeks spent at Masaryk University Children's Hospital in Brno, Czech Republic were incredibly valuable to me. Not only was I able to learn a great deal and see a wide array of medical conditions, but I was also granted the privilege of seeing a unique context of healthcare delivery and culture. Current US presidential candidates are advocates for universal healthcare here. Since the Czech Republic is a modern country with a well-developed economy and longstanding socialized medicine, it may provide a useful model for study of the benefits and disadvantages of bringing such a system to America.

Abstract Title:

Clean Water, Prosthetics and Clinical Skills in Papua New Guinea

Abstract Number: 2016BIOM2456

Abstract Authors:

Caleb Schlauderaff, DO; Daniel Ojala, DO; Mathieu Cameron Mehl, DO

Pacific Northwest University of Health Sciences, College of Osteopathic Medicine

In partnership with the NGO Water Hands Hope, three classmates from Pacific Northwest University of Health Sciences embarked on a three week medical mission to Papua New Guinea. Our mission was to install and deliver Sawyer 0.1 micron water filters, provide sanitation education, and deliver LN-4 prosthesis and training of their use to physical therapists. At Port Moresby General Hospital Emergency Department we observed systemic lupus erythematosus, rheumatic heart failure, malaria ("black water fever"), and numerous different tuberculosis sequelae. It became glaringly evident how important clinical skills are for diagnosis in rural hospitals where resources are limited.

Local preceptors instructed us in various emergency procedures including wound management and how to form a differential diagnosis in the acute care setting.

In Madan, home to a large Rainforest Alliance associated coffee plantation, we installed water filters for the employees and the local, remote medical clinic where we also practiced OMT on a patient with a shoulder injury. We also delivered 25 LN-4 prosthetic hands to Mt. Hagen Hospital. On we traveled, to Kundiawa General Hospital where Polish Chief Surgeon Dr. Jan Jaworski, Catholic priest and founder of a hospital school for the deaf allowed us to be first assistants on many procedures. Suturing machete wounds, performing bone grafts in osteomyelitis, rushing expectant mothers into emergency Caesarian sections and extracting ruptured appendixes were part of the daily, invigorating schedule. Our suturing skills and ability to actually contribute increased drastically. We became useful sets of hands and minds in an overburdened and under-resourced emergency department. Whatever procedure there was to do, we were given the opportunity to learn.

After summiting Mt. Wilhelm, the tallest mountain on PNG, we eagerly jumped back in to life at the hospital and installed five filters. We then supplied water filters to 8 public schools and a rural health outpost in partnership with United Way Gor. We were welcomed in a way unlike any we'd ever seen by traditional song and dance. Among others to receive filters were the Pediatric Ward, Emergency Department, hospital mess hall, and the hospital's school for children with special needs. In all, we supplied 50 prosthetic hands, and 50 water filter systems throughout PNG. The most moving hand fitting was to a local Kundiawa police officer who'd been the victim of a debilitating machete wound.

Abstract Title:

Safety NET (Nepal Earthquake Taskforce)

Abstract Number: 2016BIOM2451

Abstract Authors:

Angela Kim, OMS-III; Cyril Blavo, DO, TM, MPH, FACOP; Logan Vander Woude, MPH, OMS-III; Mayur Banjara, BPH

Nova Southeastern University College of Osteopathic Medicine

Introduction: On April 25th 2015, a 7.8 magnitude earthquake struck Nepal. The devastation did not cease then, Nepal suffered about 100 subsequent aftershocks, including a 7.3 magnitude aftershock on May 12th 2015. An estimated 9,000 people lost their lives due to the earthquakes. Nepal also suffered an estimated 4 billion dollars in direct economic losses.¹ International Health Initiatives, a small non-profit humanitarian organization, led by osteopathic medical and public health students, including natives of Nepal, initiated an effort to provide help to those affected.

Methods: A needs assessment was conducted in December 2015 in order to address the communities perceived needs. It was determined that a sustainable clean water source for rural schools was essential for continued health and wellness. The children in these remote schools are especially susceptible to diarrheal illnesses and dehydration due to contaminated drinking water. After a review of available options, the reusable Community LifeStraw filter was selected. It removes 99.999% of bacteria, viruses, and parasites from the water and can purify over 70,000 liters of water, enough to provide clean water to a community for several years.² In January 2016, the students raised money to support their mission by tutoring and hosting board review sessions.

Results: From our fundraising efforts we were able to purchase and ship three Community LifeStraw filters to three different rural schools. These filters now provide hundreds of children with a sustainable clean water source.

Conclusion: Osteopathic medicine emphasizes the importance of empathy and humanism in medicine and daily life. We are honored to be able to give back to these children in Nepal. These Community LifeStraws will provide water to the children for several years to come at no cost to them. It will help prevent thirst and disease while promoting learning. We plan to evaluate the success of the water filters for improvements that may be needed for future projects. Though this outreach project, we not only helped three communities, but we learned applicable skills in conducting needs assessments, fundraising, and global health that we will use to carry out future international outreach projects.

Abstract Title:

Drug abuse educational modules; assessing effectiveness among children in El Salvador

Abstract Number: 2016BIOM2424

Abstract Authors:

Tyler Edward Weeks, BS, OMS-I; Brian Hill, PhD; Dean Sutphin, PhD; Kendall A Talley, BA; Kevin Price, MAML; Nicholas F Ryan, BS; Susan Meacham, PhD

Edward Via Virginia College of Osteopathic Medicine

Introduction: The Edward Via College of Osteopathic Medicine (VCOM) conducts outreach and disease prevention missions both domestically and abroad. In the Latin American country of El Salvador, in conjunction with their permanent medical clinics, one of the outreach strategies involved providing education to local children and adolescents in underserved areas. Five modules provided information on health, social knowledge, and making healthier lifelong decisions, one focused on substance abuse. The high prevalence of drug abuse along with minimal substance abuse services made this topic of utmost importance. Data from a previous study that interviewed street

children in a neighboring country reported up to 56.5% of children sniffed glue, 42.5% drank alcohol and access to a long term residential rehabilitation center was available to less than 10% of the population.

Objective: The objective of this study was to determine if the substance abuse educational modules provided by VCOM resulted in improved knowledge in children. Secondary objectives were to see if prior knowledge differed by age and gender.

Methods: The IRB approved cross sectional study was conducted in underserved communities on five consecutive days during a week-long trip to San Salvador, El Salvador. Study participants were identified by in-country collaborators and all attending children were encouraged to participate. Data was collected from participants 8-14 years of age with signed parent consent and child assent forms. In small groups a pre-test was administered, the substance abuse educational module provided and a post-test conducted. The test contained three questions about alcohol use, one question about sniffing glue, and one question about what to do if a friend uses drugs. Descriptive statistics provided means and standard deviations for variables assessed and two-tailed t-tests evaluated survey responses for statistical significance at $p < 0.05$.

Results: A total of 110 participants completed the substance abuse educational module and the pre-and post-tests. There were 103 participants meeting the age and approval inclusion criteria, with paired pre-and post-tests; 41 males, 60 females, and 2 who did not specify a gender. The average age of the 103 participants was 10.5 ± 1.4 years (mean \pm standard deviation). Participants showed an overall 6% improvement in substance abuse knowledge from the pre-test to the post-test. Correct pre-tests scores were 74% or better and improved to 81% or better for correct post-test scores. The most improvement was observed in the question pertaining to the dangers of sniffing glue with the correct response rate increasing from 88 to 97% ($p = 0.03$). When children were asked “who to tell when a friend uses drugs” a 7% improvement was observed between pre- and post-test correct responses ($p = 0.01$). Pre-test responses did not differ by gender. However, pre-test responses were more often correct in children 11-14 years of age than in children 8-10 years of age when asked if sniffing glue could harm the body ($p < 0.01$).

Discussion: The children’s knowledge regarding substance abuse prior to the intervention was encouraging and evidence that educational opportunities had been provided. Likewise, the absence of gender differences in children’s responses indicated opportunities had been provided to this cohort without gender bias. Children’s test responses following the educational module provided by VCOM on substance abuse improved overall correct responses by 6%. The data showed that participants made the most improvement in responses about the harmful effects of sniffing glue and about who to notify if a friend is using drugs. Several factors may have affected the teaching-learning outcomes when improvements were not statistically significant, i.e., language barriers and numerous distractions during the module.

Conclusion: Knowledge about substance abuse was apparent in this cohort of children and was reinforced and enhanced as evidenced by improvements in selected content areas. The most improvement was noted when children were advised to contact a teacher if they had a friend using drugs. Thus, children were able to identify substance abuse problems. Future interventions should provide information about how to assist friends engaging in unsafe substance abuse behaviors.

Research Category – 1st Place Winner

Abstract Title:

Use of region-specific human papilloma virus stereotypes in improving cervical cancer prevention methods in Peru

Abstract Number: 2016BIOM2519

Abstract Authors:

Anastasia Kariagnina, PhD; Gary Willyerd, DO; Justin McCormick, PhD; Katelyn Phelps, DO; Kayla Jelinek, DO; Laura Harding, BS; Ruben Kenny Briceno, MD; Santoaga Benites, PhD; Shane Sergent, DO; Zenggang Li, PhD

Michigan State University College of Osteopathic Medicine – East Lansing, MI

Cervical cancer is the most fatal cancer for women in Peru. Efforts to increase early screening and vaccination in Peru have not been successful, suggesting a necessity of improved prevention strategies. For nearly forty years, human papilloma virus (HPV) has been accepted as the most frequent cause of cervical cancer worldwide. The high-risk (HR) HPV genotypes covered by the vaccine are types 16, 18, 31, 33, 45, 52, and 58. HR types 35, 39, 51, 56, 59 and 68 are not covered by the vaccine. Globally, HR types 16 and 18 account for 70% of cervical cancer. This project aims to discover whether the increasing prevalence of cervical malignancy could be mitigated by the current HPV vaccination or if geographical variations in HPV serotypes would prove this vaccination ineffective.

In August 2015 and 2016, the Michigan State University College of Osteopathic Medicine's (MSUCOM) annual medical service elective in Peru partnered with physicians at Universidad César Vallejo to collect cervical cell samples from women in the Loreto and La Libertad regions of the country. Cell samples were preserved using Hologic PreservCyt Liquid Media kit and sent to MSUCOM where viral DNA was extracted using a Qiagen DNA extraction kit. RtPCR with type-specific primers were used to determine which of the 13 high-risk serotypes were present in the cell samples.

Samples from 2015 have been analyzed and the samples from 2016 have been collected and preserved. DNA analysis of the 2015 samples revealed a 15.9% incidence in high-risk HPV in women from Loreto and La Libertad (Loreto, n=126; La Libertad, n=111.) Serotyping of these samples showed marked deviation from the high-risk strains covered by HPV vaccine, with 35 and 45 being most common in Loreto. Strain 16 was the most common in La Libertad.

High incidence of cervical cancer affects not only Peru, but other developing countries as well. The results of this study indicate that the current HPV vaccination alone may not be sufficient to protect

women against cervical cancer. This may be especially true in Loreto where HPV strain 35, which is not covered by the vaccine, appears to be one of the most prevalent serotypes of HPV. It is in these areas especially that a strong emphasis should be placed on early and consistent Papanicolaou screening. In order to protect the women of Peru and other developing nations from cervical cancer, it is crucial that policy changes be introduced. This study suggests that the most effective prevention strategies would include programs encouraging early screening and education on HPV prevention as well as creation of a more economically efficient, type-specific vaccine.

Research Category – 2nd Place Winner

Abstract Title:

Urine Arsenic and MDA Levels in the Adult Population of Pataz, Peru

Abstract Number: 2016BIOM2506

Abstract Authors:

Gary Willyerd, DO, FACOEP, FAODME; Katelyn Phelps, DO; Leah Manimalethu; Lorenzo Lim, DO; Ruben Kenny Briceno, MD; Samantha Ward ; Santiago Moises Benites Castillo, MD; Shane Sergeant, DO

Michigan State University College of Osteopathic Medicine

Arsenic is an odorless and tasteless metal that occurs naturally in rocks and soil. Over time, water that comes into contact with these rocks and soils can also become contaminated. As these toxic elements become concentrated in the water, they can lead to numerous health implications including renal dysfunction and cancer once ingested.

To demonstrate a correlation between arsenic in the urine and an increase prevalence of renal disease, Michigan State University College of Osteopathic Medicine (MSUCOM) students have tested multiple biomarkers such as urinary malondialdehyde (MDA), 8-hydroxy-2'-deoxyguanosine (8-OHdG), beta(2)-microglobulin (B2M) and N-acetylc-beta-D-glucosaminidase (NAG). Recent studies have documented high levels of arsenic in drinking water in the Altiplano region of Southern Peru which have been correlated with these biomarkers; the most promising of which is MDA. This study will further test the validity of using MDA as a biomarker for kidney damage from arsenic in a previously unstudied region of Peru, Pataz.

Urine and blood samples were collected from 102 patients ranging in age from 2 to 81 years of age in Pataz. An additional 38 urine and blood samples were collected from patients in the same age range from Trujillo, Peru, to be used as a control sample. All urine samples were tested for arsenic using the Osumex HMT Arsenic Kit. Serum MDA was calculated using the malondialdehyde,

MDA, ELISA Kit. Values were analyzed and compared to normal standards set by the World Health Organization. Standardized normals included urine arsenic <100µ/L and serum creatinine 0.6-1.3mg/dl. Physiologic values for serum MDA range from 0.05-10.0µmol/L. In this study, MDA values >5.0µmol/L were considered high based on the control samples from Trujillo, where patients were never exposed to arsenic.

Of the 102 patients tested in Pantaz, 91.2% (n=93) of patients had elevated urine arsenic levels and 93.1% (n=95) of the participants had MDA levels >5.0µmol/L. In comparison, of the control patient samples, none had elevated urine arsenic levels and only 5.3% (n=2) had MDA levels >5.0µmol/L. Abnormal creatinine levels were found in 58.4% (n=59) of the Pantaz samples, whereas only 18.4% (n=7) of the Trujillo samples were abnormal.

This study suggests that the Pantaz population has a significantly high level of urine arsenic, which directly correlates to the known elevated levels of arsenic in drinking water. The almost equally high levels of serum MDA suggests that the elevated arsenic could be the causative factor. The abnormal creatinine results further suggest early signs of renal impairment in this population. In the Pantaz population, there is a greater percentage of abnormal creatinine levels than compared to Trujillo. In conclusion, this study suggests that the population in Pantaz has renal impairment due to the high levels of arsenic in the water and would benefit from a water filtration device to prevent further renal damage. Future research into this topic should include additional MDA and arsenic levels after the implementation of a filtration device.

Research Category

Abstract Title:

Effectiveness of Taipei Hospital's CKD Education Program on Chronic Kidney Disease Patients' Renal Failure Outcomes

Abstract Number: 2016BIOM2516

Abstract Authors:

Athena Lin, PhD; Benfie Liu, BA; Emily Young, BA; Tzu-Ling Lin, RN; Vivian Wan, BA; Yin-Zeng Chen, MD

Touro University College of Osteopathic Medicine – California

Taiwan has the highest prevalence and incidence of end-stage renal disease (ESRD) in the world. Chronic Kidney Disease (CKD) may progress to ESRD, where renal replacement therapy is required. Taipei Hospital established the CKD Education Program (CKDEP) to put preventative care at the forefront of decreasing progression of CKD and ESRD. Specific diets are assigned

according to the patient's stage of CKD and patients are given individualized consultation sessions with a dietician. Analyzing the effectiveness of this program can lead to further funding and patient recruitment, alleviating the financial burden of ESRD dialysis therapy and kidney transplant shortage, and ultimately reducing the progression of CKD using effective CKD educational programs.

Hypothesis: We hypothesize that the cohort of stage 3b CKD patients in the program will have a slower rate of eGFR decline in comparison to a control group of comparable stage 3b CKD patients not in the program.

Materials and Methods:

This is a retrospective cohort study on stage 3b CKD patients who have completed Taipei Hospital's CKDEP. Stage 3b CKD, defined as an eGFR of 30 to 44 (mL/min/1.73 m²), was selected for analysis due to the higher likelihood of progressing to ESRD compared to other CKD stages. For both the experimental and control group, the rate of change in eGFR over a period of time was measured by calculating the slope of eGFR for each patient, with time elapsed (in days) as the x-axis and eGFR measurements as the y-axis. A Student's t-test was performed between the two cohorts to evaluate if there was a significant difference in the rate of change in eGFR.

Data was obtained from Taipei Hospital's medical records. eGFR (mL/min/1.73 m²) was calculated as follows: $175 \times (\text{SCr})^{-1.154} \times (\text{Age})^{-0.203} \times (0.742 \text{ if female}) \times (1.210 \text{ if Black})$.

Results: There was no statistically significant difference (p-value = 0.27) between the experimental cohort (n=91) and the control cohorts' (n=75) rates of change in eGFR. The average initial eGFR for the experimental cohort was 37.1 + 4.4 and the average final eGFR measured was 38.0 + 9.6. The average initial eGFR for the control cohort was 38.2 + 9.2 and the average final eGFR was 39.2 + 13.7. The average rate of change in eGFR for the experimental cohort was 0.0065 + 0.0437 and that of the control cohort was -0.0179 + 0.1811.

Conclusion: Although our analysis does not show a statistically significant difference, there was a positive average rate of change in eGFR for the experimental cohort while the control cohort had a negative average rate of change in eGFR. These findings suggest that Taipei Hospital's CKDEP may have a beneficial impact in slowing the progression of CKD. Further stratification and analysis of patients based on comorbidities, age, and gender may yield more detailed information regarding the effectiveness of the program in the prevention and treatment of CKD at Taipei Hospital.

Abstract Title:

Epidemiological study of risk factors and comorbidities in hemodialysis patients at Taipei Hospital in Taiwan: a fixed cohort survey, 2010–2014

Abstract Number: 2016BIOM2508

Abstract Authors:

Edwin Liu, OMS-II; Steven Lee, OMS-II

Touro University College of Osteopathic Medicine – California

Background:

Currently, Taiwan accounts for the highest prevalence of patients with chronic renal failure, and one of the highest for patients undergoing hemodialysis for Chronic Renal Failure. Under the National Health Insurance in Taiwan, all costs for patients undergoing hemodialysis are fully covered. These patients typically present with numerous comorbidities, and as the number of patients with chronic renal failure continues to rise, so does the burden on Taiwanese families and the Taiwanese national healthcare system. This study is aimed at understanding trends of potential risk factors and comorbidities related to chronic renal failure, and current challenges on healthcare providers' screening and diagnosis to treat this condition in its earlier stages. Our goal is to help improve prevention education and care of CKD patients.

Hypothesis:

By examining factors such as age, gender, admission department, and comorbidities, we anticipate to raise awareness of the patient population seen for CKD, improve prevention education, and treatment for patients with chronic renal failure.

Materials and Methods:

Patient data from 2010-2014 was retrospectively collected from the Taipei Hospital database using ICD-9 codes for chronic renal failure, femur fracture, and osteoporosis as our inclusion criteria. 786 patients were included on the basis of being treated for chronic renal failure requiring hemodialysis (ICD n585). The data collected included patient age, sex, comorbidities, and department referral. All identifying patient information was removed from our collected data. Literature search was performed to compare our data with past findings.

Results:

Out of 786 patients, our results revealed that the average age of patients diagnosed with chronic renal failure with Taipei Hospital was 63.2 years old (stdev=14.65), with male ages avg= 61.64, women= 67.65. The median age was 64 years old. When age groups were stratified, patients age 60-69 made up the majority at 23.7% of all patients with chronic renal failure. Surprisingly, patients ages < 60 accounted for nearly 40% of the cohort. Additionally, analysis of hemodialysis admission department revealed that approximately 33% of patients who received hemodialysis were admitted through departments outside of nephrology.

When looking into risk for osteoporosis in chronic renal failure patients, the relative risk for women to develop osteoporosis after chronic renal failure diagnosis was 0.98. Risk ratios for femur fracture in chronic renal failure patients were also calculated. Patients that had osteoporosis and chronic renal failure, had a relative risk for developing a femur fracture of 26.18. Lastly, the odds ratio of being female versus male and suffering from a femur fracture after diagnosis was calculated to be 1.74.

Discussion and Conclusion:

Our data indicated that the median age of chronic renal failure for patients at Taipei hospital is was in line with data collected in 2009 with a median age of 64. This finding suggests that the hemodialysis patient population in Taiwan is actually slightly higher than the average age of ESRD patients in the United States, which was 62.5 according to the 2015 Annual Data Report conducted by the United States Renal Data System. However, our data does reveals a wide age spread of patients with chronic renal failure, due to our standard deviation being 14.65.

It is believed that chronic renal failure should cause a decrease in hormones and minerals required for bone reformation. The unexpected low calculated risk ratio for being female and developing osteoporosis after being diagnosed with chronic renal failure may warrant questions of bettering effective and early screening of osteoporosis at Taipei Hospital, given that we were still able to show an increased risk for femur fracture in women diagnosed with osteoporosis and chronic renal failure.. Lastly, the finding of a large percentage of hemodialysis patients being referred from outside departments suggests that many patients are relatively unaware of their renal status and the importance of seeking medical care for it.

Abstract Title:

The Fascial Distortion Model's Role in Treating Musculoskeletal Dysfunction Within a Language Barrier

Abstract Number: 2016BIOM2507

Abstract Authors:

Angela Amaniampong, BS; Gary Willyerd, DO; Jennifer Ribar, DO; Joe Gorz, DO; Katelyn Phelps, DO; Lorenzo Lim, DO; Michael Joseph Wilk, BS; Sara Lang, BA; Shane Sergent, DO

Michigan State University College of Osteopathic Medicine

The Fascial Distortion Model (FDM) has a wide-reaching utility in the relief of somatic dysfunction. In addition to contributing to the reduction of musculoskeletal pain, FDM is thought to be useful in the improvement of musculoskeletal range of motion, especially within the context of

existing restriction. FDM is reliant upon patient body language to diagnose underlying dysfunction and to determine specific corresponding treatment modalities making it an ideal method of treatment in the context of a language barrier.

Shoulder dysfunction and musculoskeletal pain is a common complaint in Iquitos, Peru and the surrounding Amazonian villages as discovered in previous epidemiologic studies. This has been contributed to a variety of etiologies such as the lack of mass transit and the burden of carrying heavy loads on their head and shoulders for long periods of time.

Patients 18 years or older that presented to the Michigan State University College of Osteopathic Medicine's outreach clinic in Iquitos, Peru with existing shoulder, neck, upper back, or upper arm pain, restricted range of motion, or reduction of function were included in this study. Those with a history of shoulder surgery were excluded. A total of 13 patients were recruited, each of which had the Fascial Distortion Technique applied to treat all apparent dysfunctions. Patients were instructed to abduct their arm to the maximum active range of motion end point and a pre-treatment measurement was recorded. After each dysfunction was addressed, another measurement was taken in an identical fashion to evaluate immediate improvement of shoulder range of motion, and subsequent improvement in function. Quantitative data was obtained from the pre- and post-measurements of shoulder abduction using a goniometer.

Results:

12 out of 13 subjects gained range of motion on the side of their primary musculoskeletal complaint. The mean improvement in shoulder abduction range of motion on the side of the primary complaint was 30.0°, while a more modest mean improvement of 11.9° was observed on the side opposite the primary complaint.

Conclusion:

The Fascial Distortion Model is an effective modality in the treatment of somatic dysfunction and musculoskeletal pain within a language barrier when applied to treat shoulder, neck, upper back, and upper arm issues. Further studies may address other areas of musculoskeletal pain and dysfunction using FDM to determine which kinds of complaints are most effectively treated with FDM in similar global outreach settings. The high prevalence of musculoskeletal complaints in underserved areas encourages further studies with the FDM modality to bring as much benefit as possible to an environment with limited medical resources.

Abstract Title:

The Prevalence of Anemia in Urban Lima, Peru, a Pilot Study

Abstract Number: 2016BIOM2505

Abstract Authors:

David Drozek, DO; Francis Blais, DO; Rachel K Booth, DO

Ohio University College of Osteopathic Medicine

PURPOSE: To determine the prevalence of anemia in adults living in impoverished communities of urban northern Lima, Peru. It is hypothesized that 10-20% of adults will have anemia based on a 2015 study of anemia in Latin America and the Caribbean.

BACKGROUND: Anemia is a global health problem that affects one-fifth of the total Peruvian population according to a 2015 study. This disease, most commonly a consequence of iron-deficiency, may have adverse health effects such as fatigue, dizziness, headaches, and cognitive problems. Important relationships exist between poverty and nutrition, predisposing certain communities to anemia. In South America, major causes of anemia are malnutrition and infection.

METHODS: During June, 2016, a team from Ohio University, held neighborhood clinics in impoverished communities of northern Lima. A random sample of patients at least 18 years of age, presenting for the clinics, were asked to participate in the research project. Blood was obtained via a finger stick of consenting adults, collected in capillary tubes and hemoglobin (Hgb) was measured using an Alere Hemopoint analyzer. Descriptive statistics were used to analyze the data. Anemia was defined as a Hgb level of less than 13 g/dL in men and less than 12 g/dL in women according to 2011 World Health Organization standards.

SUMMARY OF RESULTS: For 310 subjects selected for Hgb measurement, ages ranged from 18-87 years, with a mean of 45.2 years; 53 were males (17.1%), 247 females (80%) and 10 of unspecified gender. For the males, 14 males (26.41%) had Hgb levels below 13 g/dl; 87 (35.2%) of the females had Hgb levels below 12 g/dl.

CONCLUSIONS: The prevalence of anemia in this sample of impoverished adults living in northern Lima was higher than the global average which is estimated to be one-fourth of the population and higher than the Peruvian average which is just under one-fifth of the population. Further study of this population would be valuable to confirm the prevalence in a larger sample as well as define the cause of anemia, assess its clinical impact and implement strategies to prevent, detect and treat this illness.

Abstract Title:

Assessing education intervention modules on violence and sexual abuse knowledge in Honduran and El Salvadoran children

Abstract Number: 2016BIOM2497

Abstract Authors:

Brian Hill, PhD; Dean Sutphin, PhD; Kendall Alexander Talley, BA; Kevin Price, MAML; Nicholas Ryan, BS; Susan Meacham, PhD, RD; Tyler Weeks, BS

Edward Via Virginia College of Osteopathic Medicine

Abstract: Honduras (HN) and El Salvador (ES) are two countries with high rates of violence. The intentional homicide rate in HN is 13.6 times the world average and ES's intentional homicide rate is 6.4 times the world average. Violence in the form of sexual abuse is also an issue of concern in these two countries. In 2014 79% of adolescent HN girls in relationships experienced some type of physical, psychological, or sexual abuse. This violent culture has been attributed to the prevalence of gangs, poverty, and other social matters. A pre-educational assessment of violence and sexual abuse knowledge was conducted, followed by an education module and a post-education assessment. The study aim was to determine if the teaching modules improved the children's knowledge of key violence prevention concepts. This study also determined if the higher intentional homicide rate in HN suggested different responses to the pre-assessment questions compared to the ES children's responses.

Methods: The VCOM Institutional Review Board approved cross sectional study took place in four communities in HN and five in ES. A survey was given to all children participating asking about their overall quality of life. Then the children were given a pre-test that consisted of four questions that evaluated their understanding of key violence and sexual abuse prevention concepts. A 20 minute educational module was presented followed by post-test questions which were the same four questions in the pre-test. The correct responses were scored and used to calculate the percent improvement for each pre and post-test question and determine differences between countries. There were three possible responses to each of the following questions: Q1 What is a good way to keep yourself safe? Q2 What should you do if someone hits you at school? Q3 What should you do if someone steals from you at school? Q4 Which of the following is defined as sexual abuse? Statistical analyses were performed with significance set, a priori, $p \leq 0.05$.

Results: Approximately 514 children participated in the program and 203 participants met the inclusion criteria. Study subjects included children ages 8 to 14 years and with signed child assent and parent permission forms (ES, $n = 98$; HN, $n = 105$). The mean (\pm standard deviation) age for the ES participants was 10.44 ± 1.87 years and for HN participants, 9.90 ± 1.50 years ($p = 0.02$). The HN children were 38% males and 62% females, ES children were 35% males and 65% females. After the educational intervention children scored higher on the post-test compared to the pre-test. The percent increase in correct question responses for the ES participants was 6.68% while the percent increase for the HN subjects was 3.73%. Both cohorts had significant improvements on how to keep safe, 13.3% ES, $p = 0.001$, 10.5% HN, $p = 0.001$. When asked what to do at school

both cohorts had pre- and post- responses greater than 90%. When asked to identify behaviors considered sexual abuse, ES responses improved 7.1% from 63.3% to 70.4%, $p = 0.03$ and there was no change in HN with an 80% correct response rate for both pre- and post-scores. There were no significant differences in the percent correct between country cohorts when asked about violence prevention behaviors (Q1-Q3). The HN children had a higher correct (80%) response when asked to recognize sexual abuse behaviors compared to ES (63%), $p = 0.01$.

Conclusion: The increase in correct responses indicated children's knowledge was positively influenced about important ideas in violence and sexual abuse prevention. The lower initial correct responses in ES were associated with greater improvement rates following the interventions for two of the four questions. The HN population was more knowledgeable about prevention and identifying inappropriate behaviors which could be attributed to the higher prevalence, and thus, awareness even among young children, of violence in their country and the likelihood of violence being more deeply rooted in their culture. In the future it would be advantageous to format questions that account for the various ages and comprehension levels seen in participants. Additional opportunities arose to educate VCOM pre-medical students regarding in-country customs and sensitivities regarding violence and sexual abuse education. Other limitations to the study may include language and cultural barriers as well as distractions from their peers and the surroundings. Participants of this age can be easily distracted skewing the effectiveness of the modules and assessment of their knowledge. These dilemmas can be addressed in future studies.

Abstract Title:

Comparison Between Fried Frailty Score and Established Prognostic Factors in Predicting Mortality of Hemodialysis Patients in Taiwan

Abstract Number: 2016BIOM2493

Abstract Authors:

Athena Lin, PhD; Benfie Liu, BA, MSMHS; Felicia Han, BA; Joseph Mak, BS; Yin-Zheng Chen, MD

Touro University College of Osteopathic Medicine – California

Background: Taiwan has the highest prevalence of end-stage renal disease (ESRD) in the world, with rates increasing especially in younger demographics. Currently, Charlson Comorbidity Index (CCI) and serum albumin level have been independently established as accurate predictors of quality of life, adverse outcomes, and mortality in this patient population. A previous study conducted at Taipei Hospital showed a strong inverse relationship between Fried Frailty Score (FFS) and serum albumin. Frailty is a phenotype construct that reflects declining health and function, and is

associated with increased risk of chronic disability, hospitalization, and death. It has also been shown that reducing frailty can improve quality of life, allow functional independence, and ultimately lower mortality rates. However, while frailty is a valid prognostic factor, it is not routinely assessed when determining the prognosis of ESRD patients on hemodialysis. By correlating FFS-based mortality predictions with mortality rates predicted by CCI and serum albumin level, we hope to eventually incorporate FFS into standard clinical management of ESRD patients on hemodialysis, reaffirming the first osteopathic principle which states that a person is a union of body, mind, and spirit.

Hypothesis: We hypothesize that FFS will directly correlate with 1- and 2-year mortality rate in patients with ESRD on hemodialysis, as predicted independently by the CCI and serum albumin level.

Methods and Materials: The hemodialysis patient population at Taipei Hospital consists of approximately 172 patients on regular treatment with hemodialysis. We interviewed patients in Mandarin and collected answers to the Frailty Index scoring guideline (n = 99). Frailty Index is scored on unintentional weight loss, weakness, slow walking speed, low physical activity, and self-reported exhaustion/depression. A score of 3-5 is considered frail, 1-2 is pre-frail, and 0 is non-frail. Serum albumin levels and other comorbidity data were also collected from the Taipei Hospital hemodialysis database to calculate the CCI.

Results: Out of 99 patients, 30 had FFS = 0; 28 FFS = 1; 24 FFS = 2; 9 FFS = 3; 5 FFS = 4; and 3 FFS = 5. Albumin averages with FFS = 0 was 3.63 ± 0.31 ; FFS = 1 is 3.53 ± 0.31 ; FFS = 2 is 3.54 ± 0.26 ; FFS = 3 is 3.19 ± 0.64 ; FFS = 4 is 3.13 ± 0.42 ; and FFS = 5 is 2.97 ± 0.31 . Linear regression showed a $-0.14x$ relationship ($R^2 = 0.92$). Age-adjusted CCI score for FFS = 1 was 1.2 ± 0.92 ; FFS = 2 was 2.1 ± 1.11 ; FFS = 3 was 2.8 ± 1.90 . Patients with FFS = 4, 5 were not included due to low n. 40 of 99 patients reported exhaustion/depression, but their medical records showed no ICD codes for clinical depression.

Conclusion: The results of this study show that mortality rates as predicted by Fried frailty score and Charlson comorbidity index are strongly correlated. Since CCI is the current prognostic standard for ESRD patients on hemodialysis, this finding strongly suggests that FFS is also a valid prognostic method in this patient population. Additionally, frailty screening is easily incorporated into routine clinical visits and factors the patient's daily living situation into predicting outcomes. This information can be utilized by physicians to formulate targeted treatment plans to produce better outcomes. Specifically, FFS can be incorporated into routine management of ESRD patients to improve functional ability, mental health, and quality of life.

Abstract Title:

The prevalence of elevated BMI in children living in poverty in Lima, Peru, a pilot study

Abstract Number: 2016BIOM2487

Abstract Authors:

David Drozek, DO; Jessica James, DO; Karen Montgomery-Reagan, DO; Matthew Lee Johnson, BS

Ohio University College of Osteopathic Medicine

BACKGROUND: Globally, according to WHO criteria, the prevalence of obesity in children is about 13% (body mass index (BMI) of 30 kg/m² or more), predisposing to lifestyle related diseases such as diabetes, hypertension, cardiovascular disease and others. In 2012, in adolescent school children in Lima, Peru, the prevalence of overweight (BMI 25-29.9 kg/m²) was 33.7%, and obesity 14.4%.

HYPOTHESIS: Of the children sampled, at least 34% will be overweight and at least 14% will be obese.

MATERIALS & METHODS: From June 5-15, 2016, a Global Health team from Ohio University Heritage College of Osteopathic Medicine held medical clinics in impoverished areas of northern Lima. After obtaining consent from the accompanying responsible adult, height and weight of clothed children (less than 18 years of age) presenting to the clinic were obtained by medical students utilizing a tape measure and digital scale.

RESULTS: Data were obtained on 723 children, 335 (46.3%) female, 317 (43.8%) male. Gender was not specified for 71 (9.8%) children. The age ranged 1 month to 17 years, with a median of 6 years. For the 337 children aged 1 month to 5 years, (176 males, 136 females) 21.3% were overweight and 24.8% obese. For males in this age range, 21.0% were overweight, 23.9% obese; for females, 21.3% were overweight, 25.7% obese. For 273 children aged 6-11 years, (102 males, 136 females) 16.4% were overweight, 29.8% obese; 13.7% of males were overweight, 30.4% obese; 18.4% of females were overweight, 29.4% obese. For 103 children aged 12-17 years, (39 males, 58 females) 18.6% were overweight, 32.0% obese; 20.5% of males were overweight, 33.3% obese; 17.2% of females were overweight, 31.0% obese. Overall, 17.2% were overweight, 25.1% were obese; 18.6% of males were overweight and 27.1% obese; 19.1% of females were overweight and 27.8% obese.

CONCLUSION: The prevalence of overweight in this sample of children living in poverty in northern Lima was less than in the 2012 study in adolescent school children in Lima. However, the prevalence of obesity in this sample was greater than in the 2012 study. Further work needs to evaluate the specific contributing factors to elevated BMI in this population, with the aim of creating and implementing strategies to prevent, detect, and reverse obesity in children in this population.

Abstract Title:

Non-conformity in the Anatomical Description of the Duodenum and the Impact on Surgical Care

Abstract Number: 2016BIOM2485

Abstract Authors:

Ann B Collins, MA; Chelsea Lyn Wallace, MS; Jesse Martin, BS; Paul A Brisson, MD, MS, FACS, FAAP; William Christian Hamrick, BS

Edward Via Virginia College of Osteopathic Medicine

ABSTRACT

While transitioning from a classroom to a clinical setting, medical students commonly must relearn clinical anatomical terms. This is often due to differing anatomical terminology between anatomy text books and surgical descriptions. This lack of uniformity compounds the mentally challenging process of learning anatomy and could result in some detriment to the patient. In this manuscript we will discuss one of many examples of anatomical discrepancies that exist when transitioning from preclinical textbook anatomy to clinical anatomy.

A clear description of the different parts of the duodenum is of great importance to surgeons. Injuries to different areas of the duodenum require different protocols for operative management. The American Association for the Surgery of Trauma (AAST) has clearly described the four parts of the duodenum, and the surgical treatment required for injuries to each part, utilizing easily identified anatomical landmarks. The AAST anatomical description of the duodenum differs from all the major anatomy texts used by medical students during their preclinical training. We recommend standardizing the terminology used to describe the parts of the duodenum by the adoption of the AAST anatomical description. We feel that this important change will maximize the efficiency of communication of both students and physicians in a clinical setting.

HYPOTHESIS

There is often a difference in terminology taught to medical students by academic anatomists and the terminology used by practicing physicians whom students work with during their clinical years. Miscommunication is currently a major healthcare issue that can result in patient morbidity and mortality. We propose that if the terminology used to describe the human anatomy is standardized between academic anatomists and physicians, then student communication with physicians during clinical years will improve, resulting in a more efficient and productive clinical education experience.

MATERIALS AND METHODS

Differences between academic anatomical literature, the American Association for the Surgery of Trauma (AAST), and texts used by radiologists exist concerning the naming of the portions of the

duodenum as well as where these portions begin and end. We sought to investigate these differences and decide upon a common terminology. We researched the description of the duodenum in eighteen anatomical resources consisting of texts commonly used in medical school, surgical textbooks, and published articles. We then examined comparisons to find the description that is most commonly used and requires the least amount of reader interpretation.

RESULTS

The conflicting nomenclature in naming the duodenum is a prime example of non-conformity in the naming of anatomical structures. This has been a longstanding problem in medical education when transitioning from an academic to a clinical setting. Of the eighteen resources found, six different descriptions of the duodenum were described.

CONCLUSIONS

We suggest standardizing the terminology of the duodenum to maximize the efficiency of communication for both students and physicians.

The medical education experience would benefit greatly by replacing vague, conflicting anatomical descriptions with clinical descriptions that utilize easily identifiable landmarks. Making this change will lessen the learning curve for medical students and possibly reduce iatrogenic errors.

Abstract Title:

The prevalence of vitamin D deficiency in impoverished communities in northern Lima, Peru, a pilot study

Abstract Number: 2016BIOM2480

Abstract Authors:

Andrew Makowski, MS; David Drozek, DO; John Paes, DO; Michaella Thomas, BS

Ohio University College of Osteopathic Medicine

BACKGROUND: Vitamin D deficiency is an epidemic, affecting more than a billion people globally. In Lima, Peru, vitamin D levels may be influenced by overcrowded conditions, air pollution and chronic disease status. A 2009-2010 study of vitamin D levels in Peru demonstrated that 47% of children living in an impoverished area of southern Lima had a deficiency in 25 hydroxy vitamin D level (25(OH)D₃). A US study in 2011 demonstrated 41.6% of adults, with 69.2% of Hispanic adults, having a deficient level of vitamin D.

PURPOSE: The purpose of this pilot study is to measure the prevalence of vitamin D deficiency and insufficiency in a sample of impoverished adults living in northern Lima. It was hypothesized that more than 40% of the study sample would have deficient levels of vitamin D. The Endocrine

Society defines deficient levels as being ≤ 20 ng/mL of 25(OH)D₃, insufficient being 21-29 ng/mL of 25(OH)D₃.

METHODS: In June 2016, a Global Health team from Ohio University Heritage College of Osteopathic Medicine provided medical clinics in impoverished communities in northern Lima. From a random sample of consenting adults, finger stick capillary blood samples were applied to Whatman protein saver cards and subsequently dried. Dried blood samples were then punched, extracted, and analyzed by liquid chromatography tandem mass spectrometry.

RESULTS: 25-Hydroxy vitamin D samples were obtained from 144 adults, 116 (80.6%) women, 20 (13.9%) men, 8 (5.6%) unspecified gender, age range of 18-94 with a mean of 39 years. In 66 patients (45.8%), 25(OH)D₃ was deficient. In 74 patients (51.4%), 25(OH)D₃ was insufficient. In 4 patients (2.8%), 25(OH)D₃ was sufficient. For the women, 57 (49.1%) were deficient, 56 (48.3%) insufficient. For the men, 7 (35%) were deficient, 13 (65%) insufficient.

CONCLUSIONS: In this sample, nearly one half of those tested had deficient levels of 25(OH)D₃, with the vast majority (97%) having less than sufficient levels. Further study needs done on a larger sample of the population, with a focus on correlating factors.

Abstract Title:

Impact of Medical Mission Trips on Pre-Clinical Medical Education

Abstract Number: 2016BIOM2478

Abstract Authors:

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Intro/Hypothesis: The purpose of this study is to explore and demonstrate the beneficial aspect that medical mission trips have on preclinical medical students' education. Medical mission trips afford the opportunity for early exposure to patient care, including the unique experience of interaction with patients from different cultural, spiritual, and socioeconomic backgrounds. Pre-clinical medical students who participate in mission trips are more comfortable and skilled seeing patients and performing examinations when compared to peers who have not participated in similar trips. Additionally, these students develop a greater understanding of various cultural, spiritual, and socioeconomic differences, allowing them to develop confidence in seeing and interacting with patients.

Materials and Methods: Approximately 40 students from the Lake Erie College of Osteopathic Medicine traveled on mission trips between June and July of 2016. These students were asked to

complete an anonymous post-trip survey to assess their confidence and comfort level seeing patients and performing basic clinical skills. In addition, the survey looked at their understanding of cultural, spiritual, and socioeconomic differences that could impact patient care. These results were compared to a similar survey sent out to students who did not participate in trips. There were 27 responses to the participant survey and 45 responses to the non-participant survey.

Results: Participants in medical mission trips demonstrated increased confidence in all except one category relating to both patient interaction and understanding various issues that may affect patient care. 62.96% of medical mission trip participants stated that they felt comfortable performing a basic physical exam on a patient, compared to 33.33% of non-participants. Additionally, 92.59% of participants felt comfortable showing empathy to a patient of a different cultural or spiritual background, compared to 66.67% of non-participants. Similar trends were found for 14 additional questions relating to different aspects of patient care. Overall, 70.37% of medical mission trip participants felt that their medical education benefitted greatly because of their trip.

Conclusion: These findings emphasize the importance and impact that medical mission trips have on the advancement of pre-clinical students' education. Except for one category, participants in medical mission trips were more comfortable in all skills associated with providing patient care and understanding socioeconomic, cultural, and spiritual factors that affect care. Medical mission trips provide valuable experiences and allow students significant exposure to various clinical scenarios during the pre-clinical years.

Abstract Title:

Risk Factors Associated with Abnormal PAP Smears in Tegucigalpa Honduras

Abstract Number: 2016BIOM2470

Abstract Authors:

Emily Aquila, BS; Alexis M. Stoner, PhD, MPH; Dean Sutphin, PhD

Edward Via Virginia College of Osteopathic Medicine

Introduction/Hypothesis: Even with advancements in cervical cancer screening, it remains the leading cause of cancer death among Honduran women. This study investigated risk factors associated with abnormal PAP smears reported by Honduran women and their level of knowledge about cervical cancer. The primary research hypothesis is that women in Honduras will have modifiable risk factors associated with previously reported abnormal PAP smears and limited knowledge regarding cervical cancer transmission and prevention.

Material and Methods: During a month long medical rotation in October 2015 a mixed-methods study was conducted at the James Moody Clinic at Baxter Institute. A sample of 100 women from

the city of Tegucigalpa Honduras and surrounding villages completed a pre-validated survey adapted from Sullivan, 2010. Women were eligible if 18 years or older and verbal consent was obtained. Statistical analyses were used to determine risk factors associated with women with abnormal PAP results. Additionally, a standard interview protocol was used to interview six residents (three with medical background and three without) to determine their level of knowledge on cervical cancer and its prevention. Qualitative analyses were conducted to detect major themes that emerged from the interviews.

Results: Overall, 82% of participants reported previously having had a PAP smear, with 12% having had an abnormal result. Of the women who reported having had a normal PAP smear, 84% had only 1-2 sexual partners ($p < 0.05$) and no previous diagnosis of a vaginal infection (60%, $p < 0.05$) compared to those with abnormal PAP smears. There was no statistical difference between having had a previous abnormal PAP smear and smoking status, number of children, or poor hygiene. Qualitative data from the interviews revealed a lack of knowledge of risk factors associated with cervical cancer including HPV transmission pathways and HPV vaccination status. Of the six people interviewed, those women without a medical background repeatedly responded “I don’t know” to a majority of the questions. Also, it was commonly misunderstood that only men were able to get HPV. Only two of the three with a medical background were well-informed about cervical cancer and HPV and were able to describe how people contract the virus and transmit it to others.

Conclusion: Results of this study indicate that abnormal PAP smears are associated with women who have more sexual partners and vaginal infections compared to those with normal PAP results. Incomplete knowledge of cervical cancer and prevention among the small sample in this study indicate need for education. Based on these results of the small sample the hypothesis is accepted. Additional studies are needed to determine the extent and type of educational programs on cervical cancer, HPV, hygiene, and vaccination that would create more awareness and lower incidence of cervical cancer.

Abstract Title:

Assessing the Knowledge, Attitudes, and Behaviors regarding Violence (KABV) against Women and Children in San Jose, Costa Rica

Abstract Number: 2016BIOM2463

Abstract Authors:

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University of New England College of Osteopathic Medicine

Physical and sexual violence against women and children is a widespread and underreported problem in Costa Rica, both nationally and regionally in San Jose. The most recent international report of gender-based violence involving Costa Rica, The International Violence Against Women Study from 2008, indicated that of the 908 women interviewed nationally, 33% had suffered physical

violence from an intimate partner. In 2003, a survey of 600 cases of abuse in Costa Rica conducted by the Institute for Social Studies on Population (IDESPO) reported 74.2% of the perpetrators verbally abused their children and 65.3% employed physical violence. Although national statistics of violence towards women and children have been reported to some extent, such studies for the San Jose region have not been described. This pilot study aimed to assess the knowledge, attitudes, and behaviors regarding violence against women and children within four under-represented, resource-limited communities of San Jose. The goal of this needs assessment was to assist future public health initiatives to reduce prevalence and incidence of violence in the area. Qualitative interviews with key stakeholders were conducted with SWOT analysis. Each stakeholder completed a likert scale questionnaire to rate the availability of resources for victims of violence towards women and children within their communities. All methods were aimed at determining 1) the participants' opinions regarding violence; 2) the strengths and weaknesses of current prevention programs and; 3) opportunities for progress in the future. Likert scale questionnaires were completed by (n=14) participants. 100% of the respondents either "strongly agreed" or "agreed" with the statements "Violence towards women is a big problem in our community" (92% "strongly agreed" and 8% "agreed") and "There is a link between violence towards women and violence towards children" (79% "strongly agreed" and 21% "agreed"). The comprehensive interviews also revealed major themes of low self-esteem, fear, shame, cultural justifications of violence, and lack of education as contributing to the complexity of the issue. Therefore, a previously validated program designed to empower women in these communities by boosting both self-esteem and autonomy could address the challenges of this community. Further research to design, implement, and evaluate the effectiveness of a comprehensive empowerment and violence prevention program of this kind is necessary.

Abstract Title:

Determining Disease Prevalence and Medical Needs at Partnering4Africa's Family Medicine Clinic in Lugala, Uganda: A Retrospective Study

Abstract Number: 2016BIOM2459

Abstract Authors:

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OBJECTIVE

To collect data on the most prevalent diseases at Partnering4Africa's (P4A) Community Health Clinic in Lugala, Uganda. Data were used to determine the amount of medical equipment, medications, laboratory equipment, and staffing needed each month to efficiently and cost-effectively meet the medical needs of the clinic and its patients.

DESIGN

This was a retrospective data collection review. Data collection started October 1st, 2015 at Partnering4Africa's Community Health Center in Lugala, Uganda and ended January 31st, 2016. The head nurse and clinic COO, Clementina Awino, and Medical Clinical Officer, Andrew Kagwa, collected the data. They used a government issued health logbook to hand write each patient's information. This included patient name, date of service, village they are from, clinical diagnosis, prior treatment, type of specimen, investigation required, date of sample collection, date sample was received, clinician name, and results. At the start of each month a new book was issued and used for data collection.

Each month, Clementina Awino sent the clinic data to Megan Battin, president and founder of Partnering4Africa, to be reviewed and analyzed. When in Uganda, Megan received the data at the clinic - patient names are redacted. When in the United States, Clementina Awino's emails redacted patient data for review. Secondary to limited resources and monetary donations at the clinic, it was critical to determine what diseases are prevalent during each month. The data is used to effectively staff and stock the clinic with the appropriate medications, lab tests, and pharmaceuticals.

SETTING

Lugala is a small town in the Ugandan bush and sits on the edge of Lake Victoria. This lake is the second largest fresh water body in the world, creating a farming and fishing culture. Partnering4Africa's Community Health Clinic sits in the center of the small town, next to a private school and church. It provides primary care for the general community. Patients who cannot receive treatment at this clinic are referred to a hospital approximately 2 hours away. However, most patients cannot afford transportation, thus P4A's clinic is left to treat a wide range of illnesses and diseases.

PATIENTS

All community members in search of care or treatment are seen at P4A's community clinic. The average patient lives on less than \$1 per day and has never seen a physician. Most patients earn their daily wage through farming rice and corn.

In Uganda 49.9% of people are under the age of 14, 48% 15-64 years old, and 2% of the population is over 64. Women outlive men 2:1 with a life expectancy of 54 years. 1 in every 10 children does not live past the age of five and 5 women out of 1,000 die each year during childbirth. Uganda's mortality rate is one of the highest in the world and ranks 209 out of 227, making it in the top 9%. To note, Uganda is one of the top 10 countries in the world for the prevalence of HIV/AIDS with approximately 1.2 million people living with AIDS. Of importance, 50% of Ugandans do not have access to even the simplest of drugs and medications (1).

For this study, all clinical disorders were documented. No patient was excluded from this study, as all data were pertinent.

METHODS

For this study, the directors recorded and categorized the number of lab tests run October 2015 - January 2016. These tests included: Malaria RDT, Widal Test, HIV Testing HCT, Pregnancy beta-hCG, RPR/VDRL, BAT Brucella, RBS, UA, Hep B Ag, H. Pylori, Sickle Cell Smear, Zn Sputum Analysis, Stool Analysis, Hgb Grouping and Cross Match, Wet Prep, CBC, LFTs, Rheumatoid Factor, and ESR. After each lab test was completed, results were recorded as negative or positive.

Directors were asked to record the total number of patients seen with a particular disease and the number of patients who were treated or offered treatment. Diseases recorded included: malaria, typhoid fever, diarrhea, STI's, RTI's, anemia, HTN, DM, helminthiasis, animal bites, PID, dysentery, neonatal sepsis, measles, pneumonia, UTI's, skin rashes, TB, tetanus, brucellosis, meningitis, cholera, sickle cell anemia, dental caries, gingivitis, otitis media, cataracts, alcohol abuse, asthma, malnutrition, HIV, road traffic accidents, family planning services, and immunizations.

Data were analyzed to determine the five most prevalent diseases each month. We calculated the number of patients with positive lab tests and those that required treatment. We were able to determine the average number of lab tests run each month and the average number of patients needing treatment in order to determine the amount of medication and lab test kits that should be stocked monthly.

MEASUREMENTS/MAIN RESULTS

We determined the lab tests that were most commonly run and resulted in positive results with treatable means. In October and November the five most common lab tests run were malaria RDT, Widal Test, HIV Ag, beta-hCG, and RPR/VDRL. In December the five most common lab tests run were malaria RDT, Widal test, beta-hCG, H. Pylori, and stool analysis. In January the five most common lab tests run were malaria RDT, Widal test, beta-hCG, stool analysis, and hemoglobin grouping and cross matching.

From these results we then looked at the percent that were positive. Results are seen below.

Oct-16

Lab Test	Number Tested	Positive Tests	Percent Positive
Malaria RDT	120	50	41.6

Widal Test (Typhoid)	15	5	33.3
HIV	77	2	2.5
B-hCG	15	5	33.3
RPR/VDRL20	1	5	

15-Nov

Lab Test	Number Tested	Positive Tests	Percent Positive
Malaria RDT	101	60	59.4
Widal Test (Typhoid)	1	1	10
HIV	253	3	1.1
B-hCG	36	5	13.8
RPR/VDRL49		11	22.4

15-Dec

Lab Test	Number Tested	Positive Tests	Percent Positive
Malaria RDT	98	56	57.1
Widal Test (Typhoid)	7	2	28.5
B-hCG	36	5	13.8
H. Pylori	5	2	40
Stool Analysis	22	12	54.5

16-Jan

Lab Test	Number Tested	Positive Tests	Percent Positive
Malaria RDT	71	53	74.6
Widal Test	6	4	66.6

(Typhoid)

B-hCG	5	2	40
Stool Analysis	2	2	100
HB EST.			
Grouping and Cross Match	7	3	42.8

From these results we were able to estimate the average number of malaria, typhoid, pregnancy, HIV, H. Pylori, stool analysis, and Hb cross and match tests that would be used per month and approximated the number of tests

that will be positive. The average number of malaria tests per month was 97.5 with an average of 54.75 patients needing treatment. The average number of typhoid tests is 7.25 per month, an average of 5.25 patients each month requiring treatment. The average number of HIV tests used each month was 181.25 and an average of 4.25 patients needed treatment each month. Average number of pregnancy tests run each month was 23; 4.25 patients on average will need prenatal treatment. An average of 31 syphilis tests are completed each month; 4.5 patients will, on average, need treatment. An average of 2.75 tests are run for H. Pylori each month; 1.25 patients will, on average, need medication. There are 9.5 stool analysis done each month, an average of 3.5 patients will need treatment. Finally, an average of 8.75 Hb cross and matches are done each month, with 1 patient needing treatment.

CONCLUSION

It can be concluded from these results that the clinic should stock an average of 98 RDT malaria kits, 8 typhoid tests, 182 HIV kits, 23 pregnancy tests, 31 syphilis tests, 3 H. Pylori tests, 10 stool slides, and 9 blood slides each month. Medication should be prepared and ready to treat an average of 55 malaria patients, 6 typhoid patients, 5 pregnant women, 5 syphilis patients, 3 patients with H. Pylori, 4 patients with GI worms, and 1 person for anemia. The findings here should allow the clinic to budget appropriately and better manage finances. The findings will also allow for staffing levels to be determined over any given month.

Not entered into student competition:

Abstract Title:

A community health and environment assessment to support the nutritional status of households in a community in the Dominican Republic.

Abstract Number: 2016BIOM2483

Abstract Authors:

Susan Meacham, PhD, RD, Dean Sutphin, PhD, Brian Hill, PhD, Adele Huls, PhD, RD and Maria Garcia

Edward Via College of Osteopathic Medicine

Introduction: The World Health Organization (WHO) established goals to improve global health and measure achievements between 1990 and 2015. In a final report the "data... proved... that targeted interventions, sound strategies, adequate resources and political will, even in the poorest countries can make dramatic and unprecedented progress" (2015 MDG Report). The report shared that mortality rates for infants and children under-five dropped over a 22 year period from 1990 to 2012. However, the improvement in the Dominican Republic (55%) was the lowest of the three countries (El Salvador, 73%) and Honduras, 61%) where the Edward Via College of Osteopathic Medicine (VCOM) has permanent health clinics.

Purpose: The purpose of this component of a multifaceted, longitudinal study was to assess the health and environment of residents in the community of Domingo Miaz in the Dominican Republic. Descriptive data help characterize environmental health concerns, i.e., safe water, adequate food, personal safety (violence, sexual abuse). The results of this applied research effort will guide the development of future programs to provide continual improvements in nutritional status as well as personal and community health.

Methods: Staff at the VCOM owned clinic in Veron and community partners identified households to participate in a household survey. VCOM post-baccalaureate student teams visited the selected households and provided the necessary introductory information to comply with IRB approved consent protocols and data collection procedures. The head of each household provided answers to an hour long oral survey. Local volunteers provided Spanish interpretations.

Results: During the first trip 10 households were visited with 1 to 7 residents per home. Descriptive data was collected on 35 residents, 15 males and 20 females. Residents ranged in age from 7 months to 62 years, 20 greater than 18 years of age, and 8 less than 5 years of age and all but 4 were members of the nuclear family. Nine households reported having a stove, six reported having a refrigerator and none had a microwave, water heater, air conditioning or computer and internet connection. When asked, "Did you have sufficient food for the family during the past year?" 7 responded "always or almost always". When asked, "How would you qualify the nutrition in your home?", 4 responded "good", 3 stated "regular" and 1 "poor" with not enough resources being an explanation for an inadequate and poor quality diet. Three households indicated that they had received information about healthy eating during the past 2 years. When asked, "What foods do you eat in your home?" the number of heads of households responding to the following items being consumed daily were: meat and grains (7); sugar and oils (5); vegetables (4); fruits (3); eggs and dried fruits (2). During the last 12 months 4 households had given their children supplemental Vitamin A. During the past 2 weeks 3 of 5 children under five years of age had diarrhea. The source of domestic

water for 7 households was well water and all bought their drinking water from a commercial vendor delivering by truck and most treated their water with 'cloro'.

Discussion: In an effort to continue to see greater improvements in households in the Dominican Republic improvements in nutritional status will be a primary targeted intervention. Increases in daily fruit and vegetable intake and reductions in empty calories from sugars and oils will contribute to improved nutrient intakes for all members of a household. Reduced childhood morbidity and mortality along with improving the nutritional and health status of all members of a household will lead to healthier and more productive residents in underserved communities like Veron in the Dominican Republic.

Abstract Title:

Osteopathic Family Medicine in the Amazonian rainforest

Abstract Authors:

Travis Gordon, DO; Steven Gallas, DO; Miranda McGahan, DO; Hyrum Brodniak, DO; Randal Davis, DO; Samantha Cotler, DO; Yasmin Mohiuddin, DO; Gary Gordon, BS

Florida Hospital East Orlando Osteopathic Family Medicine Residency

Methods/Summary:

The surrounding villages of Iquitos, Peru have very limited healthcare access. Travel in the area is mainly by boat, which can take several days to arrive to the Iquitos, with the closest health post having minimal capabilities. Costs and time of travel deter many patients from acquiring needed healthcare. As such, the Peruvian Navy is tasked with making routine visits to these villages, however are often overwhelmed by volume of patients. In our second annual trip to this region, we sought to augment the assistance to these communities by providing basic, yet further-reaching medical services to all ages encountered. Family medicine was the scope of our practice.

Six Family Medicine Residents under the supervision of one Family Medicine Attending along with one interpreter visited Iquitos, Peru where we were chaperoned by the Peruvian Navy on one of their vessels. We stayed on this vessel for 4 days, visiting a total of 4 villages along the Nanay river. Patients were treated either on-board in small medical rooms or within the village itself, depending on difficulty of terrain. Basic pharmacologic treatments, OMT, trigger point injections, prolotherapy and neural prolotherapy were available to patients. No radiological or laboratory capabilities were afforded. When treatment was not available, the Navy was made aware of the patient's case so that follow up could be arranged.

Results/Conclusions:

Amongst 7 physicians we were able to treat 725 patients over 4 days of clinic. OMT was rendered to 145 patients (20%), and 65 patients received an indicated injection (8%). The largest age group treated was pediatric at 392. Of adults age 18-64 there were 276 and the geriatric population was smallest at 57. In speaking with the Navy, this appears to reflect the general population distribution of the area, with children representing a large portion of the population.

Most patients expressed symptoms of enteral parasitic infections including subacute to chronic abdominal pain and GI disturbances. Skin infections, mostly fungal, were very common among the population. One acute forehead laceration was repaired in a 5 year old child.

A medical outreach experience of this nature would not have been feasible without the support of the Peruvian Navy, who assisted not only in travel logistics but also security, food preparation, clinic setup and some translations. We are very grateful for their contributions and intend to continue to foster this newly established relationship in order to continue to provide better, more sustainable health care to the Amazonian villages of Peru.