

2012 BIOMEA Abstracts

This issue of *The Journal of the American Osteopathic Association (JAOA)* contains abstracts submitted through the Bureau on International Osteopathic Medical Education and Affairs (BIOMEA) student poster competition. All participants who submitted abstracts to the BIOMEA competition were welcome to present posters at the BIOMEA seminar, which was held on Sunday, October 7, 2012, during the 2012 Annual Osteopathic Medical Conference & Exposition.

A first- and second-place winner was selected for each of the BIOMEA's 2 abstract categories: research and outreach. The winning abstracts are noted at the beginning of each category.

To enhance the readability of this special feature to the *JAOA*, all abstracts have been edited for grammar and basic *JAOA* style. The content of these abstracts has not been modified. Neither BIOMEA nor the *JAOA* assume responsibility for the abstracts' content. Information provided reflects information that was submitted by the primary author; therefore, institutional affiliations may represent that of the primary author only.

Research

BIO1167—1st Place Winner Effect of Clinical Screening, Treatment, and Health Education on Schistosomiasis Prevalence in Tanzania: A Longitudinal Study

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Background: Schistosomiasis is a neglected parasitic infection that affects 200 million people worldwide, with populations in Africa making up more than half of those infected. Although it is simple to prevent and treat, schistosomiasis has not garnered the attention needed for its prevalence to be effectively decreased.

Objective: This study is an ongoing investigation of schistosomiasis around the shores of Lake Victoria in Northeastern Tanzania. It was started in 2007 by our predecessors in the Touro University College of Osteopathic Medicine and Global Physicians Corps. We believe that a concerted effort involving the following 2 components can drastically reduce the incidence of this infection: (1) proper health education and (2) adequate diagnostic screening and pharmaceutical intervention.

Methods: In the past, our study focused on how schistosomiasis is a significant cause of morbidity and mortality in the 2 villages of Minigo and Masonga. In 2012, we expanded our outreach to include the village of Sota, another community at high risk for contracting schistosomiasis. We used mobile clinics to test fecal and urine samples of more than 800 individuals. Praziquantel was given as treatment for those who tested positive, and we required each individual to answer a questionnaire and attend a health education seminar. To elucidate the long-standing influence of our screening,

treatment, and health education programs, we compared and analyzed prevalence rates in previously screened vs non-previously screened individuals.

Results: When analyzing data from 2011 and 2012, we found that those who previously participated in our program had a significantly lower prevalence of infection than did those who had not participated (27.5% and 46.1%, respectively; $P < .0001$).

Conclusion: These results demonstrate the efficacy of our diagnostic, treatment, and health education programs as a sustainable modality for decreasing the epidemiologic burden of schistosomiasis.

BIO1165—2nd Place Winner Characteristics and Management of Breast Cancer in Taiwan

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Background: Breast cancer currently claims the highest incidence rate and fourth highest mortality rate of all cancers in Taiwan. Studies show that while the 5-year overall survival rate in Taiwan is comparable or higher than in many western countries, it is still slightly lower than that of the United States, at 81% vs 89%, respectively. Despite the difference in survival rate, potential reasons behind these health outcomes remain relatively unexplored. The goal of this study was to help identify unique factors that may be influencing the 5-year survival rate of patients with breast cancer in Taiwan.

Hypothesis: Different prevalence of ER/PR/HER-2 over-expressions, stages of breast cancer on diagnosis, and approaches to management of breast cancer

may contribute to Taiwan's lower survival rate for breast cancer patients.

Methods: Data from ongoing breast cancer patients were collected at Taipei Hospital in New Taipei City, Taiwan. Information collected included age, family history of breast cancer, age at diagnosis, subtype of breast cancer, ER/PR/HER-2 status, stage of cancer, lymph node status, history of surgery performed on the breast, chemotherapy and targeted therapy regimens, and therapy side effects. Comparative data on breast cancer in the United States was collected using the Surveillance, Epidemiology, and End Results database.

Results: A total of 18 patients were included in the study. Twenty-nine percent of patients were diagnosed with no lymph node involvement, 59% with only regional axillary lymph node involvement, 6% with only perineural invasion, and 6% with distant metastases. Overall, 56% of patients' breast cancers were HER-2+, 72% were hormone positive (ER+/PR+), and 5.6% were triple-negative. Among the 9 patients who were HER-2+, 56% were treated with regimens including Herceptin; of the 12 patients with hormone-positive breast cancer, 17% were treated with hormone therapy. The remaining patients were largely treated with traditional chemotherapeutic agents such as cyclophosphamide, anthracyclines, and taxanes.

Conclusion: Our preliminary study identified 3 possible factors that might have contributed to the lower 5-year survival rate reported in Taiwan. Lymph node involvement on diagnosis was greater at 59% vs 33% in the United States. This may suggest that breast cancer may be diagnosed at a later stage in Taiwan. Furthermore, although prevalence of ER+/PR+ was similar to that of the United States, our study population displayed an unusually high level of HER-2 overexpression at 56%, in contrast to the 20% to 25% normally seen. HER-2+ breast cancers

are known for greater likelihoods of recurrence and lower survival rates. Finally, an unexpectedly low percentage of ER+/PR+ and HER-2+ patients were given first-line targeted therapy in lieu of traditional chemotherapy. All of these factors may play a role in lowering the survival rate of breast cancer patients in Taiwan, and larger studies are warranted to explore this complex issue.

BIO1104

Perspectives of Manual Medicine by Patients in Developing Nations

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Background: Manual medicine has been used for thousands of years, across the world, in nearly every cultural group. Despite this fact, there have been limited data collected on how patients perceive manual medicine in terms of acceptance and effectiveness. Manual medicine can be used to manage the same medical conditions as pharmacotherapy manages but without the cost. Therefore, expanding its use in the international outreach setting may be practical and advantageous to medical personnel and patients.

Objective: This study assessed patients' perceptions of various manual therapies to explore how patient need might be better matched with available resources.

Methods: A 9-question survey was designed to investigate the perspective of patients treated with manual medicine in international clinics. The survey was translated into Spanish by a professional translation service for use during 2012 outreach trips to Ecuador, Honduras, and Peru. Data were collected from a convenience sample (N=154) of patients older than 18 years that were treated by a variety of care-givers—including physicians (DO or MD), chiropractors, physical therapists, and cultural healers—who used manual modalities. Data

were analyzed using IBM SPSS version 19 for frequencies, and Spearman and Pearson correlations.

Results: Seventy-eight percent of patients had been treated using manual medicine for pain complaints alone, and the remainder had been treated for psychological conditions, systemic diseases, or a combination of these complaints. Among the respondents, 83.1% reported manual treatment to be “very effective”; an additional 7.8% believed it was worth trying but “scary.” Eighty-five percent of patients experienced relief of their chief complaint after manual therapy. A positive significant relationship was found between patients treated by US-trained osteopathic physicians and patients who reported symptom relief ($r=0.601, P\leq .05$), patients who found treatment to be “very effective” ($r=0.560, P\leq .05$), patients who found more confidence in manual medicine after treatment ($r=0.403, P\leq .05$), and patients who would recommend manual treatment to others ($r=0.595, P\leq .05$) when compared with manual treatment performed by other caregivers.

Conclusion: Manual medicine may be a practical and effective approach to providing patient care in developing nations. Osteopathic physicians in particular were shown to provide quality care, as evidenced by a positive opinion of their treatments and favorable outcomes.

BIO1106

Health Literacy in Latin America

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Context: Health care education is a topic of increasing importance in modern medicine. A major barrier to patient education is health care literacy.¹ Low health literacy has been associated with poor outcomes in variables such as more hospitalizations, low rates of influenza vaccines, poor glycemic control in diabetic patients, and higher mortality.¹⁻³

Studies of health care literacy suggest that inadequate literacy is a pervasive problem.¹

Methods: We assessed health literacy rates with the SAHLSA-50 health literacy inventory among people presenting at free clinics in La Ceiba, Honduras and Lima, Peru.⁴ Participants were asked to complete the inventory, and in La Ceiba, they were also asked to provide their age, gender, and education level. Because the overall adult literacy rates are 80% in Honduras and 92.9% in Peru,⁵ we hypothesized that the health literacy rate would be lower.

Results: Overall, 49.0% of participants had adequate health literacy. In the subset with demographic info, literacy score was strongly associated with years of education (Pearson $r^2=0.734$, $P=.003$), but not age ($r^2=-0.123$, $P=.67$) or gender ($r^2=-0.227$, $P=.43$).

Conclusion: These results suggest that between 50% to 60% of patients seeking care at free clinics in Latin America have inadequate health literacy. Potential interventions for improving health care literacy include presenting the information in graphic format and presenting only the key facts in written format.⁵⁻⁷

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BIO1114

Controversy Over Cesarean Sections: Examining the Trend Through a Cultural Lens

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The rise in elective cesarean sections is partially accountable for the dramatic increase in the rate of total cesarean sections performed worldwide. While the global prevalence rate of cesarean sections has reached 12% of all births, some countries face levels as high as 30% (Stanton and Holtz, 2006). Elective cesareans are controversial because they often place the mother and fetus at risk of further complications when there is no medical need to do so (Minkoff and Chervenak, 2003). While cesarean sections have been a prominent procedure in the delivery process for decades, the conflicting issues regarding the benefits and risks have become a public health concern recently because of the rapid increase in rates, disparities, and health concerns associated with the procedure. A review of the literature shows that there is an overwhelming amount of evidence demonstrating that the risks involved outweigh the benefits in most elective cases. The collective idea and background research for this paper stems from our respective times spent studying abroad within the various Latin, Western, and Asian countries and medical mission trip to the El Testero Women's Health Clinic in El Testero, Mexico.

BIO1121

Patient Demand and Need for Emergency Medicine Specialists in Israel

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Hypothesis: Interviews of Israeli patients in the emergency department (ED) evidentially confirm that there is a demand and need for ED specialist physicians as opposed to the status quo of staffing general board-certified physicians.

Methods: To conduct our research, we first formulated 3 questions that were asked to patients and patients' family members who had come to the ED at Meir Hospital in Kfar Saba, Israel. The 3 questions asked were as follows: (1) How important in general is it to receive care for any disease by a specialist? (2) How important is it that you are seen by an ED specialist? and (3) Do you know what they do? The answer choices for the first 2 questions were: (a) don't know, (b) required, (c) desirable, (d) indifferent, and (e) not important at all. The third question was a yes or no question. We also asked for the participant's age and level of education, but level of education was not included in the results. These questions were then translated into Hebrew and were given to patients and their families in the form of a written questionnaire. We collected 152 surveys over the course of 4 weeks.

Results: Results show that 152 patients interviewed (64%) expect to receive care for any disease by a specialist. When asked about the importance of being seen by an ED specialist (in the ED), 152 patients interviewed (61%) believed that this is also required. When asked if the patient or family member understood the specialist physician's responsibilities, 152 (61%) responded positively. Most importantly, there was a 0.967 correlation when comparing the ratio of patients who require a specialist in any patient care setting to those who

required treatment by an ED specialist. The results show that the majority desire a higher standard of care in which specialist physicians serve in Israeli EDs. The limited positive responses to requiring ED specialists have important implications because they may be a result of the fact that patients recognize the economic restraints entailed in socialized medicine milieu. As a result of the security needs of the state, the government of Israel dictates less allocation to the funding of nationalized health care needs. Resistance met the ED specialty because it developed within the context of high quality medical care and was believed to make only marginal improvements in patient care when compared with the amount of investment needed. The population of Israel is 6.5 million, and there are 2.3 million annual ED visits. The 1991 Gulf War exposed the many inadequacies of EDs in accommodating massive numbers of casualties, triggering major changes in the subsequent years. The Israeli Association for Emergency Medicine was created in 1992. After 1993, a national trauma system was created, instituting 6 level 1 trauma centers and 12 level 2 centers. A year later, ED program directors were substituted with career emergency physicians boarded in other specialties. By 1999, the economics of Israeli medicine dictated emergency medicine be deemed a "super-specialty," in which a board-certified physician spent an additional 2.5 years of training in emergency medicine. Currently, of the 27 general hospitals offering ED care in Israel, only 7 are fully approved for 16 emergency medicine residency program spots. This number pales in comparison to the United States, which has 124 programs and 1136 annual residency graduates. The national certification examination is underway and Israeli ED residency training curriculum and objectives are flexible and have yet to be standardized.

Conclusion: Steps have been taken to accommodate the demands of the high standards of health care in Israel. However, there is an unsettling disparity of emergency medicine specialists to fill EDs

throughout the country. Efforts to bridge this gap need to strive for integration of emergency medicine into the realm of general specialties so that board-certified physicians do not need to take extra time to be emergency medicine super specialized. Emergency medicine is an under-recognized specialty in Israel, and this study shows where the people stand regarding their high expectations of the country's health care standards. Emergency medicine is practiced in a different environment and under different conditions than other specialties and therefore must have different guidelines, workings conditions, and manpower requirements. Israel's health care system is comparable with that of any developed country, and its progress in developing emergency medicine as a distinct discipline is evolving slowly but steadily.

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BIO1122

Chagas Disease Screening and Prevalence in Rural Villages of El Salvador

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There are currently 8 to 10 million people infected with Chagas disease in the Americas. The World Health Organization has reported that an estimated 232,000 people are infected in the country of El Salvador. It is responsible for the highest burden of morbidity and mortality than any other parasitic disease in the western hemisphere. Chagas disease is caused by the protozoan parasite *Trypanosoma cruzi* with the most common route through vector-borne transmission by the triatomine bug. Less than 1%

of all acute cases are diagnosed. During the acute phase, a person may have generalized fever, hepatosplenomegaly, and a sign at the portal of entry (chagoma, Romaña sign). Cardiac and neurologic signs are rare at this stage and are associated with high mortality. The parasitemia remains at a high level and can be detected using microscopy or PCR-based assays with high sensitivity. The chronic phase of Chagas disease manifests in 2 different categories: indeterminate and reactivation. Seventy-five percent of patients with chronic disease remain in the indeterminate or asymptomatic form throughout their lives. Serology has been shown to be the most useful test for this stage of Chagas disease. The remaining patients convert, or reactivate, at some point. This form is defined as to having the classic cardiac and/or gastrointestinal manifestations of the disease. We hypothesize that because of the lack of disease education and the use of preventive measures (ie, bed nets, fumigation), the prevalence within the rural villages of El Salvador will be greater than the known prevalence of the country. This study was conducted in Morazán, El Salvador, within the clinics of Perquin, Torola, and San Fernando. Participants were scheduled or walk-in patients at these clinics. Surveys and blood samples were taken from each participant. Serological testing included enzyme-linked immunosorbent assay and indirect immunofluorescence. Collectively, 310 participants were enrolled in the study, with 135, 100, and 75 participants in the villages of Perquin, Torola, and San Fernando, respectively. On the basis of statistical analysis and prevalence data from the World Health Organization, the researchers had anticipated about 10 positive participants (3.3%). Serological results showed that 25 participants (8.1%) tested positive; this is above the reported prevalence for the country. Preliminary results from positive participants showed that only 24% reported using bed nets; 84% reported that they did not know what causes Chagas disease. This study demonstrates that greater awareness of disease education and prevention efforts is critical

to reducing the prevalence rates within the rural villages of Perquin, Torola, and San Fernando.

BIO1128

Perceptions and Attitudes of Vitamin Supplements by Patients in Guatemala

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Background: In developing countries, populations are often affected by multiple nutrient deficiencies, frequently as a result of poverty and unbalanced diets. Volunteers on medical outreach trips almost always distribute vitamins to patients to combat these deficiencies. The patients take the vitamins as directed from the missions.

Hypothesis: We hypothesized that the socioeconomic and cultural backgrounds of the respondents would influence their perception of possible risks to taking vitamins.

Methods: To understand patients' views on the risks of vitamins, a survey instrument was distributed. It consisted of questions pertaining to the personal use and perceptions of vitamins including any inherent risks to consuming the vitamins. The participants were adult patients (aged >18 years) that were patients of the Rocky Vista University Global Medicine missions in April and May 2012. There was no personally identifiable information collected through the use of the survey. Surveys were conducted in 4 locations: San Antonio Palopo, Concepcion, and 2 locations in Solola. The locations were then grouped into 2 categories: rural and urban. The rural group included San Antonio Palopo and Concepcion, while the urban group included Solola.

Results: With 1 degree of freedom and a χ^2 value of 10.78, the *P* value was approximately .001. This finding indicates that the data are statistically significant, and the null hypothesis of no difference is rejected.

Conclusion: The alternate hypothesis stating that there is a difference in the perception of potential risks in taking vitamins between people who live in rural vs urban regions in the country of Guatemala is accepted. Our presentation will display a brief background along with information regarding the vitamin survey instrument and the statistics of the perception of the potential risk of taking vitamins. Additionally, we will discuss the future of the project and where patient education regarding the use and safety of vitamins will go.

BIO1139

Transcending the International Osteopathic Identity: Cross-sectional Analysis of Osteopathic Principles and Practice in Peru

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Background: Michigan State University College of Osteopathic Medicine (MSUCOM) has been leading international medical missions to Peru since 2008. Until recently, Peru did not recognize or acknowledge the licensure of osteopathic physicians. In 2011, with contributions by MSUCOM, Peru granted practicing rights of osteopathic physicians. Despite continued efforts, many Peruvians are still not aware of osteopathic principles and practice (OPP). If barriers exist to the integration of OPP in Peru, then with identification and resolution there can be further acceptance of the osteopathic medical philosophy.

Methods: Two workshops were held in the national capital, Lima, Peru. The first occurred July 31, 2012, at the national medical licensure and accreditation institution of Peru and had 30 attendees consisting of governmental health policy members and health care leaders. The second was held August 4, 2012, at one of the largest health systems in Peru and had 120 attendees consisting mostly of medical students and physicians. Informative presentations, case studies, and osteopathic manipulative medicine demonstrations were provided by second- and fourth-year MSUCOM students. Research design included a cross-sectional investigation of health perceptions using an optional scale of 1 to 5 before and after surveys. Omitted answers were excluded from the dataset.

Results: Overall response rate was estimated to be 29.3%. Primary attendance was to “learn something new/about osteopathic medicine” (30 [100%]). The majority of attendees (31 [91.2%]) had no prior knowledge of osteopathic medicine. A postevent survey reported that 22 attendees (100%) left understanding a new osteopathic concept, and 18 (78.2%) expressed interest in implementing osteopathic manipulative medicine in their practice. Responses to the probability of implementation and improvement in the general concepts of OPP were generally positive. It is feasible to conclude that the only barrier is knowledge disparity. During our workshop, it appeared that many indigenous perceptions concerning medicine take a holistic approach, and osteopathic principles were well received overall.

Conclusion: We predict that through our workshops, we improved awareness about osteopathic medicine and helped plant the seeds for further promotion. One unexpected outcome included immense national news coverage, including a live 30-minute news interview. One weakness to the study is the possible generalizability given the small sample sizes. Longitudinal studies are needed to evaluate the retention and fidelity of the data.

BIO1142

Efficacy of Prophylactic Treatment of Fishermen for Schistosomiasis in Lake Victoria Villages in Tanzania

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Schistosomiasis is a parasitic infectious disease caused by the parasitic fluke of the genus *Schistosoma*. The parasite enters the body through the skin, and symptoms include fever, abdominal pain, bloody diarrhea, and hematuria, while chronic infection can progress to hepatosplenomegaly, portal hypertension, bladder cancer, and death. Exposure to schistosomiasis is greater in villages around Lake Victoria because of a combination of lack of a clean, safe water supply, adequate disposal of human waste, and heavy use of lake resources by the local population for economic and social needs. The World Health Organization (WHO) recommends that fishermen receive prophylactic treatment because of their increased exposure to infested waters; however, other subsets of the population may demonstrate an equal or higher susceptibility to infection. A cross-sectional study was conducted between June and July 2012 at 3 lakeside villages in Northwestern Tanzania as part of a mobile clinic to diagnose and manage schistosomiasis.

Diagnosis was conducted using the gold standard of microscopic analysis of fecal and urine samples for the presence of *S mansoni* or *S heamato-bium* ova. Demographic information from participants was collected by a survey administered and completed by trained clinic staff who spoke the common languages of the area. Odds ratios (OR) and 95% confidence intervals (CI) were calculated comparing different subpopulations to fishermen. The total sample size was 788 individuals (364 female, 424 male). Compared with fishermen, 3 subgroups had similar prevalence of being infected:

female children (OR, 1.1; 95% CI, 0.6-1.9), male students (OR, 1.1; 95% CI, 0.6-1.9), and all non-fisherman males (OR, 1.5; 95% CI, 0.8-2.5).

Results indicate other population subsets in the Lake Victoria region have prevalence of the disease similar to the WHO targeted population of fisherman. This finding suggests the need to modify the WHO recommendation of prophylactic treatment of only 1 population subset and identifies many groups at equal risk in the Lake Victoria region.

BIO1143

Risk of Acquiring Parasitic Infections or Developing Intestinal Inflammation in Volunteers Traveling to VCOM International Mission Sites in the Dominican Republic and Honduras

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Background: International travelers are at increased risk for contracting an infection by *Giardia* sp and *Cryptosporidium* sp as well as other intestinal parasitic, bacterial, or viral infections. This risk also applies to participants in the Edward Via College of Osteopathic Medicine (VCOM) international medical missions. The purpose of this project was to determine whether those participants acquired parasitic intestinal infections or were affected by inflammatory intestinal disease while traveling to VCOM international sites.

Hypothesis: We hypothesized that mission trip participants acquire intestinal parasites or other inflammatory intestinal disease from traveling to VCOM international mission sites.

Methods: Eleven participants, traveling to the Dominican Republic or Honduras, each completed a gastrointestinal (GI) clinical symptom survey and provided a stool sample before traveling and 2 to

3 weeks after returning. Standard light microscopy was used to determine the presence of *Giardia*, *Cryptosporidium*, or ova of intestinal helminthes in stool samples. Two commercial kits from TechLab (Blacksburg, Virginia), the GIARDIA/CRYPTOSPORIDIUM QUIK CHECK kit and the LEUKO EZ VUE kit, were used for detection of *Giardia* and *Cryptosporidium* cysts and lactoferrin, respectively. Clinical symptom survey data were compiled and used to associate participant GI symptoms to stool sample findings.

Results: None of the pre- or posttrip samples were positive for *Giardia* sp, *Cryptosporidium* sp, or helminthes ova and 1 of the 11 posttrip samples had lactoferrin. The clinical symptom survey indicated that 2 of 15 participants had pretrip GI symptoms and 3 of 11 had posttrip symptoms.

Conclusion: Our results indicate that none of the participants acquired giardiasis, cryptosporidiosis, or other intestinal parasitic infections during their travel, suggesting that the participants are applying sufficient measures to protect themselves from these infections. The presence of one posttrip sample that contained lactoferrin indicates the presence of GI inflammation of unknown etiology in that participant. Further studies are needed to determine the risk factors associated with acquiring other infectious diseases during travel on international medical missions. Our results will allow VCOM to determine the risk of participant exposure to parasitic infections during international mission trips, thereby better protecting participants on future trips.

BIO1146**Assessing the Water Quality in the Mountains of Peru**

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Background: The recent influx of mining in the towns of Cruz Colorado and Shiramaca, Peru, has raised concerns of possible contamination of the Rio Toro, the main water source for the region. It was postulated by community members that there had been a recent increase in renal and gastrointestinal diseases as a result of the mining. In August 2011, a cross-sectional study was performed to analyze the water in the region for possible contamination in conjunction with DOCARE's annual medical service elective.

Methods: A 100-mL water sample was obtained from the Rio Toro using standard sterile water collection protocol, and gas chromatography/mass spectrometry was performed on the sample at the Diagnostic Center for Population and Animal Health (DCPAH) at Michigan State University. In addition, medical records obtained during the medical service elective were analyzed to determine the common illness found in the water sample region.

Results: Of 109 patients seen during the medical service elective, 34 (39.4%) presented with either gastrointestinal or genitourinary complaints. Most common diagnoses included gastritis (32 [74%]) and pyelonephritis (14 [32.6%]). Results from the DCPAH were also contrasted with the Environmental Protection Agency's Maximum Contaminant Levels. While many naturally occurring elements were not found to be elevated in the water source, trace amounts of organic solvents such as ethylene glycol, diethylene glycol, and glycolic acid were reported. These compounds, when ingested frequently, can cause serious nephrotoxicity and neurologic damage, ultimately leading to death.

Conclusion: Although it may be difficult to eliminate these toxins from the water supply, controlling the runoff and regulating the mining practices may be of benefit. This analysis does not confirm that the mining practices are the cause of the water contamination, but the clinical correlation of the rising incidence of kidney disease suggests that an environmental stressor may be the cause. Further studies are recommended to identify a cause and confirm that these water quality toxins were not transient in our study.

BIO1150**Preliminary Report on Health Status of the Chayanta River Valley, Bolivia**

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Background: Despite efforts by the Bolivian Ministry of Health to make health care accessible, more than 30% of the population lacks access to health care. The majority of people who do not have access are indigenous inhabitants of rural areas. Buried deep within the Andes Mountains of Bolivia is a network of impoverished villages known as the Chayanta River Valley. A difficulty in providing health care to this area is a lack of knowledge of common health issues faced by its inhabitants.

Objective: To outline the prevalence of communicable and chronic diseases including, but not limited to, dermatologic conditions, upper respiratory infections, gastrointestinal diseases, and hypertension in the inhabitants of the Chayanta River Valley.

Methods: Patients aged 18 to 100 years receiving care during community clinics were invited to participate in an anonymous survey consisting of a socioeconomic and physical assessment portion. The physical assessment portion was broken into categories with yes/no questions pertaining to specific symptoms. The categories reviewed were

as follows: general, head, eyes, ears, nose, throat, neck, respiratory, cardiovascular, skin, musculoskeletal, vascular, breasts, gastrointestinal, urinary, endocrine, genitalia, neurologic, and psychiatric. The physical assessment portion also included height, weight, age, blood pressure, heart rate, and respiratory rate. The socioeconomic portion included questions pertaining to diet, occupation, and education. When possible, the survey was administered in Spanish. When individuals spoke only Quechuan (native language), translators were used in survey administration. Surveys were administered in 5 different villages during a 6-day period. Data were entered into an Excel spreadsheet and stratified based on village, gender, and age group. Survey data were analyzed using descriptive statistics.

Results: One hundred sixty-nine patients (mean [standard deviation] age, 52.65 [20.1] years) completed the survey; 65.9% were female and 32.1% were male. The 5 top complaints were headache (59.28%), general weakness (52.10%), muscle or joint pain (50.30%), back pain (40.72%), and heartburn (34.73%). These results reflect the total population surveyed. Full data including age and gender stratification will be presented.

Conclusion: The results of this study will be used to help direct the Bolivian Ministry of Health in establishing health care services in the underserved villages of the Chayanta River Valley. The high prevalence of musculoskeletal complaints suggests that education on osteopathic manipulative techniques could possibly play an important role in the progress of health care in this region.

BIO1157

Assessing the Risk of Pediatric Double Burden in International Models

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Hypothesis: Recent studies suggest an increase in body mass index (BMI) worldwide, indicating growing obesity and noncommunicable disease incidence. The paradox of growing numbers of overweight and obese populations existing in tandem with wasting and starving populations has been termed the double burden of disease. If there is increased incidence of childhood obesity, then there will be significant changes in prevalence.

Methods: Anthropometric measurements were taken at the Clinic Centres in La Libertad, Peru, on patients aged 2 to 19 years. Surveys were also administered at these sites. Height was measured to the nearest 0.01 cm using a field anthropometer. Weight was measured to the nearest 0.1 kg using a body composition monitor. Height and weight were assessed according to standard procedures. Participants were classified by weight status according to growth charts developed by the Centers for Disease Control and Prevention and the World Health Organization. Only patients with complete data for height, weight, and BMI are presented here from 2010 (n=325) and 2011 (n=178). The Progressive Aerobic Cardiovascular Endurance Run (PACER) used a random pediatric subpopulation assignment from 2 local schools of 73 children aged 10 to 15 years. The protocol for the participants was classified as fit or unfit according to FITNESSGRAM standards. PACER is considered a valid test to estimate cardio-respiratory fitness. A survey was administered to Spanish-speaking individuals and collected information on diet, exercise, sleep, watching television, attitudes toward weight, and food insecurity (n=177). If questions were

answered unintelligible or not at all, they were not included in the findings.

Results: In 2010 and 2011, 139 (42.7%) and 46 (25.9%) participants in the pediatric population were overweight or obese, respectively. Children aged 2 to younger than 5 years were the most overweight and obese subpopulation. In 2010, 10 (18.9%) were classified as overweight and 25 (47.2%) as obese. In 2011, 11 (22.0%) were classified as overweight and 9 (18.0%) as obese. PACER Results according to the FITNESSGRAM found 93.1% of the male children and 29.5% of the female children classified as unfit. In 2011, survey participants reported eating an average of 2.7 meals (n=172) and 1.9 snacks (n=160) per day. In addition, 44 participants (61.1%) reported positive attitudes toward weight compared with 28 (38.9%) who reported negative attitudes toward weight.

Conclusion: Our data suggest obesity rates in resource-limited countries may be greater than comparable populations in the United States. Alarming-ly, the large prevalence of obesity among the 2- to 5-year-olds could indicate an increasing incidence. Results of PACER suggest poor cardio-respiratory function and increased disease burden, which appears to impact more male children than female children. Survey results suggested that parents were unaware or not concerned about their child's weight. These data demonstrate a need for intervention.

BIO1158

What DO We DO When the Medicine Runs Out?

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Hypothesis: For most US osteopathic medical schools, the required osteopathic theory and method is an integral part of the first 2 years of education. By the second year of training, the student has

acquired knowledge of basic osteopathic manipulative treatment (OMT) and can provide care under supervision. Despite the involvement of osteopathic physicians on medical missions in developing countries, the use of OMT has not been well documented. It is ideal for medical outreach trips because it only requires 2 basic tools: one's hands and one's OMT skills. Thus, any osteopathic medical student can meaningfully contribute while on medical outreach trips by using OMT.

Materials: Osteopathic manipulative treatment should be used by medical relief teams because it is applicable in most clinical environments, is adaptable to many cultures, and transcends language barriers. Furthermore, OMT does not require extensive laboratories or equipment and can be used to treat patients with acute and chronic conditions either alone or in conjunction with more traditional medical treatments. It has a low side effect profile and the benefits can be immediate. During our trip to Peru, we realized how extremely powerful human touch is and how readily OMT was accepted by patients. Many Peruvians from underserved areas were apprehensive of pharmaceutical remedies but receptive to the loving nature and healing powers of human touch.

Methods: We are 4 osteopathic medical students from 3 different schools supervised by an osteopathic physician board certified in family medicine and osteopathic manipulative medicine. We joined the 1-week annual outreach medical mission trip to Mala, Peru, organized by Health Bridges International, a nongovernmental organization based in Portland, Oregon. Our mobile outreach clinics involved health screens, primary care medicine, dental care, health education, and OMT.

Results: The inclusion of OMT into the delivery of health care by osteopathic physicians on medical mission trips should be considered essential. When access to the tools of modern medicine is limited, a well-trained human hand is a powerful tool for both

diagnosis and treatment. Although operator dependent, the application of appropriate OMT in these settings is cost-effective, long-lasting, and bypasses the barriers of language. In our experience, OMT was efficacious in our goal of providing relief of musculoskeletal pain and maximizing homeostatic balance by resolution of somatic dysfunction whenever possible. This was evidenced on numerous occasions during our trip by gathering immediate patient feedback and re-evaluating patients after treatment.

Conclusion: There are many opportunities for DOs to use their unique skills to improve the health and well-being of underserved communities throughout the world through the use of OMT. Further investigation is needed to formally and scientifically validate the impact and effectiveness of OMT on medical outreach trips to underserved areas.

BIO1162

OMT: Reducing Pain and Changing International Patient Perception

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Background: During a Michigan State University College of Osteopathic Medicine (MSUCOM) medical mission in Mala, Peru, osteopathic manipulative treatment (OMT) was offered to patients.

Hypothesis: If OMT reduces pain in these patients, then this treatment will induce positive perceptions and patients will seek out OMT again in the future. Because Peru recently granted medical practicing rights to osteopathic physicians (ie, DOs), we felt that exposing patients to OMT would be helpful in furthering the practice of the profession in Peru. Patients were referred to OMT by physicians

because of complaints of pain, headache, and other issues that were not appropriate for pharmaceutical intervention.

Methods: Osteopathic manipulative treatment was administered by second- and fourth-year osteopathic medical students from MSUCOM to 57 patients from August 6-9, 2012. Six patients were excluded from this study because of incomplete data. To measure the change in pain, a pre- and posttreatment survey was given. Pain was assessed by a subjective pain scale of 0 to 10. The surveys also asked about knowledge of OMT and what treatment they had received in the past. After the treatment, patients were surveyed on how they felt about the treatment they received, if they would seek out OMT again, and if they felt that OMT would be useful for other medical problems. The treatment used for most somatic dysfunctions was muscle energy. For patients complaining of headaches, suboccipital release, sinus release, and other cranial techniques were used. Twenty patients (39%) had superior innominate shears that were managed with high-velocity, low-amplitude technique. Forty-nine patients (96%) reported a reduction in pain (mean, 3.4 points). Two patients did not report any current pain but instead reported numbness that improved in sensation after treatment. Eighteen patients (35%) described the treatment as relaxing, whereas others simply stated that it was “bien.”

Results: After treatment, 50 (98%) reported they would seek out OMT again and 49 (96%) said that it would be useful for other medical problems. Twenty-three patients (45.1%) previously sought outpatient care for their pain; 5 had seen a chiropractor or Huesero (Peruvian bone setter). Fourteen (28%) received hospitalization and nonsteroidal anti-inflammatory drugs, which was the most common type of treatment received.

Conclusion: Osteopathic manipulative treatment reduced pain in patients seen at the clinic in Mala, and patients will seek out OMT again. However,

the lack of DOs practicing OMT in Peru will keep patients from getting the care they seek.

BIO1164

Achieving Effective and Efficient Musculoskeletal Pain Relief Through TCM and OMM

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Background: More than 100 million Americans suffer from acute or chronic pain. Living with pain impinges on all aspects of life: health, structure and function, work, and emotional well-being. In addition, the cost of treating patients with pain is expensive. For example, in 2005, \$85.9 billion was spent on managing back and neck pain alone. The goal of this research is to understand the advantages of pain management approaches using traditional Chinese medicine (TCM) and osteopathic manipulative medicine (OMM).

Hypothesis: We hypothesized that OMM and TCM can be blended to improve pain treatment.

Methods: Observational data were collected at the Traditional Chinese Medicine Hospital in New Taipei City, Taiwan, as part of Touro University-California's Global Health Internship program in June 2012. Eighty cases of pain and how these patients were examined and how the conditions were diagnosed and managed through TCM were documented. Literature research was also performed to compare TCM with OMM approaches.

Results: The general TCM approach to treatment consisted of the following: (1) palpation of the location of the pain, (2) Tui-Na, (3) acupuncture, if Tui-Na was not sufficient or pressed for time,

and (4) patient education on stretches, correction to posture, and herbal medication (if prescribed). Each patient who presented with pain was treated, on average, for 30 minutes and left the clinic with no pain or a substantial reduction of pain. The most common TCM treatment modality used for pain management was Tui-Na, which is a branch of TCM manual manipulation. During observation of 80 patients with these practitioners, the Tui-Na screening, diagnosis, and treatment seemed to be integrated into 1 process, similar to how OMM is practiced by an experienced osteopathic physician. Two distinct Tui-Na methodologies were observed. Dr Hwang used an articulatory approach similar to high-velocity, low-amplitude, and cavitation could be appreciated by the patient and practitioner utilizing a single impulse. Although patients left pain free or with substantially less pain, Dr Hwang told them that their dysfunction and discomfort would return if the myofascial plane was not also treated. Dr Chiu used a method similar to myofascial and balanced ligamentous tension to balance tissue tension to achieve release followed by articulatory techniques if needed to achieve restoration of joint motion. This approach took more time, but patients experienced greater long-term pain relief. Patients treated by Dr Chiu also received acupuncture for further relief if needed or if Dr Chiu needed a quicker method to relieve the tissue tension. It was also observed that patients who received Tui-Na and acupuncture had longer relief from their symptoms.

Conclusion: Both OMM and Tui-Na have effective methods for dealing with pain and structural dysfunctions. The 2 Tui-Na approaches observed appeared to use similar mechanisms of action to high-velocity, low-amplitude; articulatory; and myofascial ligamentous OMM techniques. It is unclear if acupuncture is required because of insufficiencies in particular manipulative techniques or if there is a self-selection bias in the types of patient seen by these practitioners. Patients with complex

pain syndromes often require a multi-disciplinary approach to manage their pain. It appears that acupuncture used in conjunction with OMM would be a cost-effective, multi-disciplinary approach to pain. We observed acupuncture used as adjuvant therapy with beneficial outcomes for pain patients. Further research is needed in this area.

Reference

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BIO1170

Examining the Prevalence of Overweight and Obese Adolescents in Contrasting Elevations of Rural Peru

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Hypothesis: High body mass index is associated with increased risk of cardiovascular disease, diabetes mellitus, and premature death. This study addressed this growing concern in children by comparing growth and development data between low- and high-altitude rural regions across Peru. As discovered by previous health screenings in high-altitude regions of Peru, we suspected the participants (aged 2 to 18 years) to be overweight or obese.

Methods: BIOMETRIC measurements were assessed according to standard procedures on 231 participants in Mala, Peru. Height was measured to the nearest 0.01 cm using a field anthropometer. Scale measurements were taken using a Seca scale. Weight was measured to the nearest 0.1 kg. Body composition was assessed with skinfold thickness in the abdomen using Lange calipers. Participants were then classified by weight and height status according to standards set by the Centers for Disease Control and Prevention (CDC) and the World

Health Organization. The data were compared with similar measurements taken in 2010 and 2011 in high-altitude, rural areas of Peru.

Results: According to the CDC, 36% (n=185) of the 2010 and 2011 sample populations were classified as overweight or obese. In 2012, the CDC classified 86 participants (37.2%) to be overweight or obese. The majority of the participants (144 [62.3%]) were classified within a healthy weight range.

Conclusion: This slight increase in the percentage of overweight or obese participants from high-altitude regions may be a result of greater access to consumer products high in calories. Overall, the data show a growing trend toward overweight or obese children regardless of altitude in which they live. Further studies should be conducted using larger, more diverse populations to investigate the growing trend of overweight or obese children in Peru.

BIO1171

Management of Chemotherapy-Induced Nausea and Vomiting in Taiwan—A Retrospective Study

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Background: Chemotherapy-induced nausea and vomiting (CINV) is one of the most commonly reported adverse effects in cancer patients. Research has shown that correct use of antiemetics can prevent CINV in almost 70% to 80% of patients. Interestingly, it has been suggested that Asian ethnicity may play a role in the development of CINV. The

goal of this study is to help identify effective management for CINV.

Hypothesis: It is hypothesized that by studying CINV management in Taiwan, more efficacious solutions can be reached to reduce CINV in high-risk patients.

Methods: While participating in the Touro University Global Health Program Summer Clerkship, we shadowed a hematology-oncology physician at the Taipei Hospital. In conjunction with the hospital, a retrospective medical record review of 19 female breast cancer patients was performed to analyze the management of cancer and CINV. All patients were given a combination of different chemotherapies, one of which belonged to either high or moderate emetogenic risk categories. Relevant variables were collected for analysis, and a literary review was performed to support our efforts.

Results: Among the 19 patients studied, 13 reported CINV during the course of treatment. Twelve were given some forms of antiemetics before or after chemotherapy treatment, independent of a CINV diagnosis. Among the patients who developed CINV, 2 had no documented use of antiemetics. Antiemetics used were either a 5-HT₃ receptor antagonist, a corticosteroid, or both. Our preliminary data also showed that there was no use of NK1 receptor antagonist as antiemetic, although it is unanimously recommended in the United States for highly emetogenic chemotherapy and, generally, for moderately emetogenic chemotherapy.

Conclusion: To manage and prevent CINV effectively, in addition to optimizing the use of antiemetics, the following practices may be considered: (1) implementation of a standardized CINV management protocol; (2) use of a NK1 receptor antagonist (NK1RA), such as Aprepitant; and (3) other treatment modalities, such as osteopathic manipulative medicine, may be added to appropriate management of CINV. Osteopathic manipulative medicine is a

noninvasive technique which has the ability to help modulate and restore proper autonomic homeostasis to the body. Integrating these practices may help to reduce CINV in high-risk cancer populations.

BIO1172

Assessment of Maternal and Reproductive Health in Women of Mala, Peru

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Background: The state of maternal health care in Mala, Peru, is not well defined. Assessment of key interventions and practices is integral for adequate international care; the guidelines of the World Health Organization (WHO) were referenced in this study of maternal health in determining this standard of care.

Hypothesis: We hypothesized that the health care being implemented in Mala, Peru, does not meet the interventions laid forth by the WHO and that there is a need for improvement on the basis of these guidelines.

Methods: Fifty-eight mothers were surveyed at a free community clinic provided by Michigan State University College of Osteopathic Medicine in Mala, Peru. The survey consisted of 31 “yes or no” questions and 6 short answer items in Spanish. The questions were developed using standards established by the WHO’s Essential interventions, commodities, and guidelines for reproductive, maternal, newborn, and child health. Each question assessed the presence or absence of certain interventions identified as critical in the study. The only criterion for exclusion in the study was being nulliparous. If illiterate, a Peruvian medical student was on site for assistance.

Results: Prior to pregnancy, 73.2% of mothers reported having access to family planning advice

and contraceptives. Furthermore, 73.7% received education regarding the prevention of sexually transmitted infections and human immunodeficiency virus. Prior to pregnancy, only 35.1% reported supplementing their diet with folic acid. A majority of women (93.2%) reported receiving a tetanus vaccine. For the prevention of pre-eclampsia, 22.2% reported taking aspirin. To prevent eclampsia, 26.8% reported taking magnesium sulfate. Forty percent reported cesarean sections. After delivering, 76.5% reported receiving nutrition counseling. Approximately 58.5% of women were treated for maternal anemia and 31.1% received screening and treatment for postpartum sepsis. The average age at first pregnancy was 20.02 years. Average duration of breastfeeding was 21.62 months.

Conclusion: This study is significant in identifying areas of focus for future public health interventions. As elucidated in this study, several areas may benefit from further intervention; these include pre-pregnancy nutrition (ie, folic acid) and the prevention of pre-eclampsia and eclampsia. These areas must be addressed further as they remain some of the principle causes of maternal death in Peru.

Outreach

BIO1141—1st Place Winner Malaria Education of School-Aged Children in Kwahu-Eastern Region, Ghana

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Objective: To increase the knowledge of school-aged children in rural Ghana regarding the vector, signs and symptoms, and prevention of malaria.

Methods: The faculty at the New York Institute of Technology (NYIT) Center for Global Health, School of Education, Wisser Memorial Library, and the Jesse M. Rohde Foundation created a story based on West African folktales to increase malaria awareness around Oworobong, Ghana. Using a multi-disciplined approach, researchers from the Wissler library, faculty from the Center of Global Health, and the School of Education created a play “Anansi Tricks Mrs. Mosquito.” A local New York artist was able to create culturally appropriate puppets that were both portable and durable. Using Anansi the spider, an established folk character as the protagonist, students and faculty from NYIT College of Osteopathic Medicine performed the play. The interactive play was shown at local schools and community health clinics. A question and answer session was also conducted following the play to clarify any questions the children had. The educational content was also reinforced by the creation of an illustrated book, published by the Publications and Advertising Office at NYIT, that was given to children at the end of the performance.

Results: The children were consistently engaged in the play and were able to recognize and identify with the characters. They had immediate recall of the disease vector as the mosquito, the signs and symptoms of malaria, and the prevention of malaria by the use of a bed net. Through the generosity of BestNet, a bed net company, we were able to distribute bed nets to a number of schools and clinics after the performance. Children were seen in villages days after the presentation with the books in hand walking to school. The publications were also reported to be teaching tools in some classrooms, as well as being reinforced in the clinics.

Conclusion: This deceptively simple 20-minute performance was created over several months to be successful. By combining the local talents from a number of specialties (education, medicine, visual arts), we were able to create an agenda

for the creation of this educational tool that could be applied to a number of diverse cultural backgrounds. Many control strategies have overlooked children's roles in malaria prevention. By using easily identifiable characters, the students were able to recall the educational objectives and thereby reduce their risk of malaria exposure by modifying their behaviors.

BIO1159—2nd Place Winner Unique Collaborative Approach to Managing Schistosomiasis in Northwestern Tanzania

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Schistosomiasis is an intravascular infection of parasitic *Schistosoma* trematodes characterized by anemia, diarrhea, and undernutrition. Chronic infections may progress to portal hypertension and squamous cell carcinoma of the bladder. Classified by the World Health Organization as a neglected tropical disease, the current worldwide disease burden is nearly 70 million disability-adjusted life years, and prevalence can be greater than 50% in villages surrounding Lake Victoria. The tropical climate and biodiversity support the unique life cycle of *S haematobium* and *S mansoni*, and a strong socioeconomic dependence on the lake potentiates sustained epidemic infections. A cross-sectional public health intervention conducted in 2012 in Shirati, Tanzania, expanded on a project initiated in 2007. A collaborative effort between community, academia, and nonprofit organizations has evolved here to provide a sustainable public health approach to decrease the disease burden of Schistosomiasis. This partnership reproducibly and reliably reduces the disease prevalence, and the methodology can be effectively extrapolated to a larger scale. Students from Global Physician's Corps and Touro University's global health program collaborated with staff from Shirati Hospital to operate a mobile clinic over the course of 7 days, examining 807 patients.

Stool and urine samples were screened for *Schistosoma* using the gold standard for diagnosis and treatment. Patients also underwent screening of signs and symptoms and were educated about transmission and prevention. A decrease in the prevalence of schistosomiasis and a cost per patient seen of \$2.35 highlight the success and efficiency of this intervention. Prevalence in Minigo decreased from 30% in 2007 to 12% in 2012, while prevalence in Masonga decreased from 48% in 2011 to 45% in 2012. These markers are significantly below accepted averages and are trending downward. This collaboration between community, academia, and nonprofit organizations establishes a partnership in which resources can be pooled to create sustainable public health projects that are both practical and efficacious.

BIO1047

Anthropometric Measures to Assess Stunting in Honduran Children: A Training Program for VCOM Medical Missions

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A simple process to prepare workers to obtain consistent and reliable body mass index (BMI) measures is being developed for VCOM Medical Missions. In remote regions, BMI values are simply, easily and economically obtained and the only objective indicator of nutritional status. Accurate BMIs are critical to differentiating various forms of malnutrition in children. Honduran children experience a higher prevalence for stunting than children in neighboring and similar income countries. In Honduras, 29% of children aged 5 years or younger are stunted. In one-third of Honduras, particularly in rural areas, stunting occurs in 50% of these young children. At birth, 10% of infants present with a low birth weight and by age 5 years,

8% are underweight. In contrast, children at risk for being overweight in Honduras have doubled over a 5-year period. Accuracy and consistency in height and weight measures are necessary to calculate reliable BMI. Accurate measures depend on data collectors trained in proper technique. At triage, a child's age, any known adverse health conditions, and special dietary practices are recorded. Height and weight measures are made without shoes and a minimum of clothing using calibrated equipment. Handheld devices for data entry, conversions to common units, and referencing Honduran growth charts eliminate human errors and are preferred. However, premade calculation and conversion charts can be used. The calculated BMI is compared with normal growth charts established in optimal environments (breast feeding, adequate nutrition, nonsmoking environment) specific for Honduran children. Other physical measures can provide additional information, but specific references for Honduran populations are difficult to confirm (eg, head, arm, wrist and waist circumferences). Accurate BMI measures, triage information, and clinical impressions relayed to the pharmacy assist body weight- and age-dependent dosing. In stable populations where repeated measures are possible, the initial accurate BMIs serve as a baseline for comparison to careful measures taken in future medical missions. Detecting small changes in BMI along with additional information from clinical examinations can help identify nutritional, congenital, or comorbid conditions contributing to poor growth. Confirmed stunting or other malnutrition conditions (obesity) can guide policies and direct resources to improve health and quality of life for future generations of Hondurans.

BIO1124

What Is Modern Medicine?

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Background: What is “modern medicine”? Is it defined by the technological and pharmaceutical advancements of the allopathic world? Is it characterized by the rapidly growing osteopathic field as it gains more support as a holistic approach to health? Or is it a revival of the traditional medicine forms that once dominated the ancient Eastern world? It seems that the debate surrounding “modern medicine” has only grown in recent years as advocates for each field fight for recognition and a purpose in the medical world; yet, there remains no clear definition. In the time I spent in India this past summer through the Child Family Health International (CFHI) program, I quickly learned that “modern medicine” is best approached not through the lens of a single discipline, but with a combination of the many forms of healing that exist in the world today. Allopathic medicine is used to treat symptoms in urgent situations; traditional and natural medicine is useful in mild and chronic conditions; and osteopathic medicine serves as a bridge between the 2 types of medicine with overlapping principles and methods from both fields. The most important concept underlying this hybrid of modern medicine, however, is that the patient is at the center of the treatment.

Methods: For my program, I traveled to clinical sites in 3 different cities in Northern India to explore global health care through the lens of 4 types of traditional medicine: homeopathy, ayurveda, reiki, and naturopathy. Traditional medicine and osteopathic medicine are similar in that they are both built around the idea of using the body to heal itself. My experience in India demonstrated how these 2 types of medicine could be integrated, but more importantly, it enabled me to learn what I could offer about osteopathic manipulative treatment to the

clinicians and fellow students who I worked with while in India. Most of the people in my program were on the brink of their venture into the medical world, unfamiliar with osteopathic medicine, and none of the clinicians in India had even heard of the practice. Consequently, my trip was largely an opportunity to educate those around me of the significance of osteopathic medicine and its role in modern medicine, specifically as a patient-centered treatment with the capacity to reach a global scale.

Results: Through observation and discussion with the clinicians in India, I learned how all types of medicine could be used to heal patients on the basis of their specific needs as opposed to simply curing their symptoms. Dr Paul, with a background in allopathic and ayurvedic medicine, used a combination of both of these types of medicine to provide comprehensive treatment for his patients in Patti, a small village in the Himalayan foothills. One of Dr Paul's patients was a 35-year-old woman with epilepsy. She had this condition for more than 15 years. Her body was patterned with burn scars from falling in the fire multiple times after experiencing light-induced seizures while cooking. Frustrated from visiting allopathic doctors with no relief of symptoms, she had come to see Dr Paul, who prescribed her a combination therapy of Epilan (allopathic) and Brahmi (ayurvedic). After a month of treatment, she reported complete remittance of seizure attacks. Dr Nanda is a homeopathic physician in Dehra Dun, in Northern India. With a background in homeopathic medicine, he recommends the use of Western medicine for acute and urgent situations, but believes that homeopathy is ideal for the treatment of chronic illnesses. One of his patients was a 20-year-old woman from our CFHI program. Afflicted with asthma, she relied on her albuterol (allopathic) inhaler multiple times per day on arriving in India. She sat down with Dr Nanda for an appointment to determine her "constitutional type"—her temperament, personality, emotions, fears, etc. Dr Nanda prescribed her *osmium sanctum*. After an expected aggravation of

her symptoms ("homeopathic aggravation"), she no longer needed to use her inhaler for the rest of her duration in India. A month later, she reported continued limited use of her inhaler, but explained that she still experienced activity-induced asthma attacks. In her case, the use of osteopathic manipulative treatment could be used in combination with the homeopathic medication she received to achieve a more effective treatment. Some osteopathic considerations include manipulation of the respiratory components to increase sympathetic response during attacks or treatment of the chest and lungs area to encourage maximal musculoskeletal motion in between attacks.

Conclusion: It is clear that "modern medicine" is not defined by a specific medical practice. It incorporates all types of medical fields, stressing the importance of the patient as the driving factor for all treatments. Sir William Osler once said, "It is much more important to know what sort of a patient has a disease than what sort of a disease a patient has." As practitioners of modern medicine, we have the ability to provide the most effective treatments for our patients with the goal not just to cure their symptoms, but to heal them.

BIO1125

The Ayacucho Mission: A Model of Making a Temporary Outreach Effort Endure

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Background: Poverty and the lack of basic needs go hand in hand in Ayacucho, Peru, a region that has been devastated by war. Though there is a regional hospital operating in the area, its supplies and supporting staff is very limited, leaving much of the population without health care. Although the Ayacucho Mission takes place only once a year, for the 2 weeks that it is in place, the team of medical professionals and general volunteers are able to provide medical,

dental, educational, and technical assistance to the impoverished population who would otherwise have virtually no access to health care. Even with operations in Ayacucho going on only 2 weeks, fundraising, recruitment, and training takes place throughout the course of the year. While many volunteers may have witnessed hardships before, being a part of the mission allows volunteers to see these people who have endured hardships wear a smile and to directly alleviate at least a part of this resilient population's struggle. This mission proves to be an ideal model for osteopathic medical students to develop an understanding of how aiding in one small part of an infrastructure within a system as well as within a person can make a lasting change for the better.

Methods: Applicants were selected through a process that included submitting a personal statement as well as a resume that ensured the mission's needs would be met in terms of personnel, as only 30 people could be accommodated, and those 30 would require skills ranging from translating to operating. Once applicants were selected, fundraising efforts went underway which included galas, bake sales, and online outreach. Medical supplies such as sutures, sterile gloves, medications, and vitamins were provided by the volunteers as well as through donations. Training of the volunteers took place through online workshops, regional clinics, and on-site orientation.

Results: Over the course of 2 weeks in Ayacucho, more than 1500 patients were seen and more than 100 surgical procedures were performed, which is equivalent to the volume the regional hospital is able to see alone in 1 year. In addition, patients who would have otherwise not received any care because of their specific ailments were able to get the treatment they needed. For example, a man with an inguinal hernia required a simple surgical procedure, but was turned away by 3 different hospitals because he had human immunodeficiency virus. The Mission team treated him.

Conclusion: The Ayacucho Mission is a successful outreach effort for providing high quality care to those without access. By providing indiscriminating care, as well as supplies and awareness to the people of Ayacucho in addition to incorporating the natives into these efforts, this mission was able to create and sustain a positive health care model in the region.

BIO1135

Impact of Medical Missions: An Osteopathic Experience in Rural Colombia

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Background: In the United States, patients are expected to return to their physicians for follow-up appointments as deemed medically necessary. However, on the majority of short-term medical mission trips, most of the physicians can only see a patient once. Through the medical mission with *Cristianas Por Fe* in rural Colombia, I experienced some of the constraints imposed on visiting physicians while learning more about the core principles of osteopathic medicine. To increase responsiveness and encourage communication regarding holistic patient care, I examined the impact of osteopathic medical care in developing countries.

Methods: I and 10 other medical students from Lake Erie College of Osteopathic Medicine-Seton Hill worked with Dr Lucas Mendoza in Canito, Sucre, Colombia, through *Cristianas Por Fe*. The village had never had a licensed physician work in its government-mandated clinic facility before we arrived. Throughout the 4 days of the mission, we treated 504 patients with the use of 30 different pharmaceuticals and a variety of osteopathic manipulative treatment techniques. Because only 1 practicing physician was able to attend the mission, each medical student took turns diagnosing conditions and treating patients while consulting

with Dr Mendoza as needed. I also assisted Dr Mendoza in a surgical operation involving encapsulated hematomas on a patient's head. After witnessing patient needs, ranging from malnutrition to pain management, I studied literature on medical missions and the after effects on rural communities in undeveloped nations.

Results: As current and future physicians, we need to be accountable for our actions and provide the necessary follow-up care and patient education to help more than hurt. All of the osteopathic principles apply to this thought process, including the fact that structure and function are reciprocally interrelated. By altering a person's structure through medications, changes will occur and in some circumstances do need to be monitored. Once we have accepted patients, it is important not to abandon them but instead to continue to follow their bodies, minds, and spirits as needed. On this specific mission, Dr Mendoza was exceptionally careful when dispensing medications to ensure that our patients did not need to be monitored after their visit to the clinic. Even though this limitation forced our team to not provide certain medications, overall the villagers were appreciative that we were able to take time out of our schedules to come and provide medical relief.

Conclusion: Understanding the combination of rural, tropical, and osteopathic medicine can provide a myriad of benefits to patients being served by medical missions, especially when health care services are preceded with necessary attention and knowledge regarding follow-up care.

BIO1149

Use of Current Anthropometric Measures to Identify Malnutrition in Honduran Children: A Training Program for VCOM Medical Missions

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The first Millennium Development Goal is the eradication of hunger and poverty. Since 2008 the prior progress toward this goal in Honduras has suffered as a result of food and financial crises. World Bank prevalence rates for acute malnutrition (wasting) in Honduras are 1.38%; underweight, 8.72%; and chronic malnutrition (stunting), 30.15%. Medical missions through Edward Via College of Osteopathic Medicine—Virginia Campus, particularly to western Honduras, where rates of stunting are highest, can identify individuals and target communities needing additional care and resources. Osteopathic physicians and mission team members have a unique opportunity to obtain anthropometric data to accurately diagnose various forms of malnutrition. International anthropometric measures used as diagnostic criteria for malnutrition have been updated and reference standards for Honduran populations established. Stunting is the best indicator for assessing undernutrition in children aged 6 to 60 months reflecting the accumulated, permanent and long-term effects in young children.

Stunting is known to result from the immediate effects of inadequate food intake, low birth weight, and incidence and management of diseases. Recently reliable and valid diagnostic anthropometric measures (ie, heights, weights, body mass indices, and upper midarm circumferences) for malnutrition in children younger than 5 years have been established. Height-for-age measures identify stunting. Weight-for-height measures are the primary measure for wasting. Body mass indices

are used to identify children as underweight, overweight, or at risk for overweight. Pitting edema, muscle wasting, and related clinical observations help identify the specific nutritional deficiencies contributing to starvation. Children experiencing insufficient protein will have bilateral edema and kwashiorkor. Marasmus is distinguished with anthropometric and clinical data and is the term for starvation from both calories and protein. Training professionals on proper diagnosis of various forms of malnutrition using the recommended anthropometric and clinical criteria will help target specific types of malnutrition. Specificity of diagnosis will enable improvements in treatment and prevention plans and policies. Additional factors at both the household and community level need to be considered to address the root problems. The sustained burden of malnutrition is prohibiting Honduras from accomplishing at least 6 of the eight 2015 Millennium Development Goals.

BIO1153

PACE-MedSpanish Immersion

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Background: A medical diagnosis is often made on the basis on obtaining an adequate medical history. In the United States, health care practitioners are increasingly met with Spanish-speaking patients. This language barrier can result in difficulty obtaining a diagnosis, an increased risk to life and limb, and concurrent medico-legal risk. In the United States, communicating in Spanish is rapidly becoming an essential medical skill. PACE-MedSpanish was started in 2002 as a sister program of PACE (Providers Aligned for Care in Emergencies) to address this issue. It has had more than 400 participants from all levels and areas of medical training. These participants experience rapid improvement of language skills and cultural literacy, while

receiving a meaningful experience in global health and medicine.

Hypothesis: We hypothesized that PACE-MedSpanish is effective at addressing the need for language skills and cultural literacy.

Methods: In San Miguel de Allende, Mexico, or other UNESCO World Heritage sites, students attend the program for 1 to 4 weeks. They learn general Spanish in a health care setting, receive individualized daily instruction, and may earn up to 50 continuing medical education credits. The students receive intensive tutoring focused on performing histories and physicals, understanding intercultural concerns, and they have unparalleled access to see actual patients in hospital and prehospital settings. Performance is assessed by precourse and post-course test scores of medical Spanish language skill and cultural competency.

Results: MedSpanish students have consistently improved when comparing the pre-course with the post-course test scores and anecdotally have become better providers of health care for Latino or Latina patients. Additionally, some students help to develop PACE training programs for local, Mexican providers.

Discussion: There is a clear need for tactical medical Spanish instruction for health care providers in the United States. The PACE-MedSpanish program addresses this need by providing high quality Spanish instruction and cultural literacy to English speakers. PACE-MedSpanish also engages the provider in global health experiences and comparative health care systems.

Conclusion: Effective communication skills are crucial in the care of patients and in developing therapeutic relationships. PACE-MedSpanish combines formal language instruction with cultural immersion to create an efficient approach to improving these skills.

BIO1154**International Health Education
in Rural El Salvador**

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The United Nations Developmental Programme has reported a rise in the net enrollment rate for children of primary school age from 82% to 90% between 1999 and 2010. As more children attend school, the expanding field of global health is now presented with new opportunities to bring effective and widespread health care education to the emerging generation. Each year, students at the New York Institute of Technology (NYIT) complete a Global Health Certificate Program through the Center for Global Health. In July 2012, 7 students participated in a fieldwork trip to rural El Salvador as part of this program.

As an outreach component of the fieldwork, NYIT students took the opportunity to organize health fairs at various grade schools in the Morazán region of El Salvador. The success of these fairs was contingent on the students' abilities to communicate in an engaging and relevant way while still being able to address specific health discrepancies in the community. Other challenges included overcoming language barriers, considering cultural differences, and maintaining realistic health care goals.

The following discussion of students' experiences is based on their visits to 4 different school environments, each which presented unique qualities and challenges. The schools differed in characteristics such as organization, accessibility of the communities where the schools were located, and private vs public education. The health fairs were presented to groups ranging from ages 6 to 18 years, and encompassed lessons in nutrition, exercise, cardiopulmonary health, oral health, and sex education.

The enthusiasm and feedback of the Salvadorian students suggest that it is possible to effectively adapt this educational agenda across other cross-cultural settings. The curriculum outlined in this report may serve as a helpful foundation for other health care workers to build upon in future educational efforts.

BIO1160**Effect of Health Education on the
Incidence of Schistosomiasis in
Lakeside Villages of Western Tanzania**

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Schistosomiasis is a parasitic infection characterized by the World Health Organization (WHO) as a neglected tropical disease. The Centers for Disease Control and Prevention estimates that there are more than 200 million people affected worldwide, with 85% of cases occurring in Africa. Infection occurs through contact with contaminated fresh water, and prevalence could be reduced by modifying socioeconomic and cultural behaviors. Lake Victoria is known to be a major source of the parasite, and proximity to it confers an increased risk for infection; lakeside villages of Western Tanzania exhibit a prevalence rate greater than 50%. In 2012, a group of medical students and physicians from Touro University examined the effect of education on the incidence of schistosomiasis by conducting a public health intervention in lakeside villages in Western Tanzania. Currently, the WHO aims to reduce the incidence of the disease by regular treatment with the drug Praziquantel. However, examining the effects of health education alone can determine whether prevention education would be an effective addition to the current regime. In our study, a total of 804 residents from 3 villages (Sota, Minigo, and Masonga) were tested for the parasite using stool samples, and 796 participants were asked how

they believed schistosomiasis was contracted. Odds ratios (ORs) were found for each village using those who tested negative as controls, and correct answers were interpreted as exposure to education. In Sota the OR was 0.75 (95% confidence interval [CI], 0.4194-0.9546), in Minigo, OR=0.833 (95% CI, 0.2772-2.5047), and in Masonga, OR=0.63 (95% CI, 0.4498-1.2727). For all villages combined, the OR was 0.65 (95% CI, 0.4903-0.862). With each case having an OR less than 1, these data indicate that those educated on schistosomiasis were less likely to be infected, therefore illustrating the efficacy of education in preventing the disease. While periodic treatment reduces the short-term burden of disease, health education is more sustainable and leads to a lifetime reduction in morbidity. It is therefore a better approach to reducing the disease burden than prophylactic treatment alone.

BIO1161

Need for Sanitation Measures in Rural Ecuador

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Background: In the United States, chronic health conditions such as heart disease, diabetes mellitus, and cancer affect nearly 1 out of every 2 adults, and are therefore the primary focus of health care efforts. In Ecuador, by contrast, acute respiratory and diarrheic diseases are the first causes of ambulatory care, and their rates are increasing, particularly in rural areas. High rates of acute infectious disease can largely be attributed to lack of access to clean water and latrines.

Objective: The aim of the clinic I participated in was to provide primary health care to residents of southern rural Ecuador, many of whom lacked access to these sanitation measures.

Methods: Through the Tropical Disease Research Program in Ecuador, I took part in a traveling health clinic that went to 3 communities in 17 days. While there, I rotated through the laboratories, which included processing and analyzing urine and stool samples, as well as assisting with blood draws and blood typing. I also rotated through the vital signs station, and shadowed in the primary care clinic on several occasions. I rotated at the hospital in Cariamanga along with local physicians, which included surgical rounds and shadowing in the outpatient clinic. Lastly, I participated in rural home visits to search for the parasite that causes Chagas disease.

Results: Nearly 700 patients were examined in total. Gastrointestinal parasitic infections were the most common overall diagnoses across patients in the 3 communities, while chronic conditions (hypertension, low back pain, osteoarthritis) only accounted for 15% of total diagnoses. Specifically, giardiasis and ascariasis were prevalent. The majority of the patients with these diagnoses lacked access to clean water to cook and wash with and had no household latrine. Additionally, repeat infections were common. Of the 7 homes I visited, 1 had a household latrine, and 1 had a bathroom structure in the yard; otherwise, the residents of the homes lacked bathroom access completely.

Conclusion: Sanitation measures are the most effective approach to preventing infectious diseases in rural Ecuador. Specifically, there is a need to increase access to clean, running water and to build latrines to limit exposure to sewage. Primary care efforts should include patient education about frequent hand washing and obtaining medications to manage infections before they spread. Much can be done to improve the health of rural residents through such measures.