phones, LCD screens, Macs and PCs. These video laryngoscopes were used to teach laryngoscopy during a first-year anesthesia orientation training course in Uganda with good reception.

Findings: Creation of functional video laryngoscopes for less than $20 per unit is feasible and may be able to increase access to this technology for educational and clinical purposes in LMICs. More formal testing and development of these low-cost video laryngoscopes is planned.

Funding: None.

Abstract #: *2.020_TEC*

A Novel, low-cost intraoperative fluorescent imaging system for surgical use: Opportunities for research capacity in low- and middle-income countries

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Background: Capacity-building efforts to train surgeons in low- and middle-income countries (LMICs) have increased the population of surgeons in these countries. Some of these surgeons may be interested in pursuing research but face prohibitive resource obstacles. For example, intraoperative fluorescent molecular imaging has emerged recently as a promising surgical adjuvant to better identify tumors, metastatic disease and diseased lymph nodes. The technology involves using a light source, filters and camera during surgery to view cancer-selective fluorophores that absorb and emit specific wavelengths of light. This growing area of research would welcome contributions from LMICs, but imaging systems remain expensive and not readily available. Our objective was to design a low-cost, easy-to-use fluorescent imaging system compatible with any traditional endoscope. Demonstrated efficacy of such system indicates that surgeons in LMICs can be not just recipients of training and resources but also drivers of research and innovation.

Methods: The imaging system was constructed solely from readily available commercial materials. We performed verification testing of three design iterations to incorporate an LED light source, minimize loss of light output, and develop an effective filtering system for fluorescence detection. The device was tested in vitro and in an animal model (chicken) using fluorophores known as quantum dots of different concentrations.

Findings: Criteria for an effective imaging system were satisfied. First, the system's "white light" intensity was comparable to that of standard clinical xenon light sources. Second, the viewing lens provided the magnification and resolution required for intraoperative imaging. Third, the system distinguished fluorescent tissue from non-fluorescent tissue with appropriate sensitivity and specificity, both *in vitro* and *in vivo*. Finally, the entire system was constructed for under 500 U.S. dollars.

Interpretation: Prohibitive cost remains an obstacle to surgeons in LMICs who pursue basic science and translational research. In the field of intraoperative fluorescent molecular imaging, we demonstrate that an imaging system can be designed at low cost and with applicability to preclinical testing. The system is compatible with standard clinical endoscopes and accommodates various fluorescent molecular contrast agents. This study represents a successful effort to potentially broaden the surgical research capacity in LMICs.

Funding: None.

Abstract #: *2.021_TEC*

Community education program developed with community members for emergency referral in northern Ghana: Lessons about active community participation for innovation and ownership of interventions

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Project Purpose: Ghana has a maternal mortality ratio of 380/100,000 live births and a neonatal mortality rate of 28/1,000 live births. Although most of these deaths could be prevented by timely access to quality care during medical emergencies, the country lacks a functional emergency referral care system. The most common options for emergency transportation in Ghana's Upper East Region (UER) are foot, bicycles, donkey carts and motorbikes. In 2012, Sustainable Emergency Referral Care (SERC) Initiative—a comprehensive system of transportation and communication for emergency referral—was launched in UER to address this need. However, the absence of an educational component to enhance utilization of SERC's transportation services was an identified implementation gap. This project focused on developing context-specific and culturally-tailored community education materials required to facilitate community members' capacity to recognize signs of obstetric and neonatal emergencies, and consequently utilize SERC's transportation services to access medical care, promptly.

Methods: The project was in three parts. The first was a qualitative study to describe community members' ability to recognize and respond to signs of obstetric and neonatal emergencies, and to elicit recommendations for effective community education. Seven focus group discussions conducted among community members in three districts were audiotaped, transcribed verbatim, coded in NVivo 10.2 software and analyzed using framework analysis. Findings guided the second part, which comprised production of educational videos in the local dialects; conceptualizing, developing and compiling educational illustrations; and organizing local groups to compose educational songs. Training of trainers and developing a curriculum to guide educational activities formed the last part.

Outcome: Qualitative study revealed mistaken beliefs and detrimental practices that merit specific focus in an educational program. Educational materials produced include two educational videos, a 40-page flip chart and jingles. Two implementation assistants

were trained and these, through training 15 trainers, have trained over 200 frontline facilitators to implement the educational program.

Going Forward: Although process and outcome evaluation of the educational program will be conducted to share the impact on utilization of SERC services, active participation of community members and other stakeholders appeared to enhance ownership of, and willingness to utilize, materials.

Abstract #: *2.022_TEC*

MundoComm: Information communication technology for maternal health in Costa Rica and Latin America

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Project Purpose: Funded by the United States National Institutes of Health Fogarty International Center in 2015, the overall goal of the MundoComm project is to develop an innovative training program to enhance the ability of community-based teams in Latin America to use Information Communication Technology (ICT) to improve maternal health. Though improvements have been made in child health in Latin America, progress in reducing maternal mortality has stalled or worsened. Evidence indicates that technological innovation, including ICT, can impact maternal mortality. Based in Costa Rica as a regional technology hub, MundoComm builds upon our group's 16-year partnership among researchers in the US, Costa Rica, and the Dominican Republic.

Design: MundoComm faculty from the United States, Costa Rica, and the Dominican Republic will train a total of 8 community-based public health teams over 3 years, with each team participating in a 1-year mentored course of training and follow-up. Training includes monthly interactive on-line modules, and 2 in-person week-long short courses in Costa Rica. The goal for each team is to develop and test an innovative ICT project to address a local maternal health problem. A "collaboratory" environment will provide ongoing mentoring and support. A mixed methods qualitative/quantitative research component will provide data on the cultural context of the maternal health problem and ICT readiness. Summative and formative evaluations will evaluate the training model and ICT innovations resulting from trainees' projects. A conference in year 03 will facilitate sustainability of the MundoComm network.

Outcome: Four year 01 teams, from Costa Rica (2), Dominican Republic (1), and Honduras (1) completed the first short course in October 2015 that included training in bioethics, use of ICT for maternal health improvement, ICT options (e.g., PhoneGap, OpenMEAP, Epi-Info, Cloud Computing, social networking), and project planning. Baseline evaluation of the 12 participants indicated gaps in knowledge of ICTs, with the highest familiarity reported for social networking (Mean: 3.3/5). Post training evaluation indicated increases in knowledge across course content areas. To date, MundoComm has demonstrated the ability to recruit and train public health teams across Latin American countries to generate ICT-based projects to address local maternal health problems.

Abstract #: *2.023_TEC*

Engaging students in global health interprofessional education

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Program/Project Purpose: As academic global health departments create curricula in global health education, a key challenge is making instruction engaging, relevant and participatory for learners. At the University of Texas Medical Branch at Galveston, Texas, we have a longitudinal year long Global Health Interprofessional Core Course (GHICC) for students interested in global health from the schools of medicine, health professions, graduate school and nursing.

The course initially consisted of large group foundational lecture sessions with small group problem based learning; however, poor attendance among large group sessions resulted in small group time being spent recapitulating important global health concepts from large group sessions. Greater interprofessional engagement with global health content did not reliably emerge. We redesigned the GHICC course structure and content to improve student participation and engagement with each other and global health content.

Structure/Method/Design: We conducted key stakeholder interviews with GHICC faculty and student co-facilitators to identify areas for course improvement. Based on these discussions, GHICC was re-designed to include once monthly experiential sessions where previous large and small group content would be combined, mandatory attendance, integration of different teaching methodologies with group activities and active reflection.

Anonymous paper based surveys were administered to students to evaluate session content, relevance, objectives, level of interaction and willingness to recommend the course to others. GHICC faculty were also surveyed on the level of interaction, engagement and student participation in the new format.

Outcome and Evaluation: Overall, both faculty and students were highly satisfied with the redesigned GHICC curriculum. Students reported high rates of satisfaction with each individual session, level of interaction and relevance. GHICC faculty reported high rates of student engagement, participation and involvement with the reformatted curriculum.

Our educational innovation encourages active interprofessional learning by employing experiential sessions that utilize a variety of teaching methodologies, placing students at the center of active decision-making and encouraging them to draw upon shared experiences. Improved student participation and engagement has greatly enhanced the interprofessional environment.