

sites and includes an HMS faculty member as a Rwanda-based research advisor and technical support. Research capacity building activities have been prioritized. District-based research trainings develop skills to both produce research and integrate research findings into practice. To develop research leadership, students are supported to complete MPhil/PhD degrees at UR-SPH. To bridge the mentorship gap due to a large student body and small faculty at UR-SPH, these students are co-supervised by UR-SPH and HMS faculty.

Outcomes & Evaluation: The following outcomes have been observed. 1) Increased interest in research: 103 PIH/Rwanda, RMoH and UR-SPH colleagues have completed training programs since 2012 and demand for training far exceeds capacity (only 25-50% of applicants accepted into trainings). 2) Increased research productivity: The number of publications highlighting PIH/Rwanda-supported programs has increased from 1-5 peer-reviewed publications per year from 2006-2012 to 10 publications in 2013 and 15 publications published/accepted/submitted as of September 2014 (published/accepted/submitted as of September 2014). 3) Increased Rwandan leadership in research: The first Rwandan-led manuscript describing a PIH/Rwanda-supported program was published in 2013, and, in 2014, 67% (of 15) were first-authored by a Rwandan. 4) Increased link of research to policy: Current research is led or advised by RMoH and PIH/Rwanda program leads, better linking results to program implementation/policy.

Going Forward: This work will continue to leverage the institutional strengths of PIH/R and HMS and partnerships with RMoH and UR-SPH. Fostering inclusive research, with clear guidelines, technical support and trainings, remains a priority. However, flexible funding for in-country infrastructure, mentorship and field-based training programs is essential for continued growth.

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Abstract #: 02ETC035

Low cost tube thoracostomy model for training in resource poor settings

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Program/Project Purpose: Tube thoracostomy is an integral procedure in trauma training. The Advanced Trauma Life Support (ATLS) and Primary Trauma Care courses both include chest tube insertion stations. Advanced simulators such as TraumaMan are available, but are often cost prohibitive, particularly in resource-poor settings. Here we introduce a new low-cost tube thoracostomy model made out of widely available five-gallon water jugs.

Structure/Method/Design: Materials: Five-gallon water jug Masking tape Clear packing tape Knife/shears Large construction paper Paper towels Permanent marker Cut a five-gallon water jug in half longitudinally so that there are two half cylinders, one with a handle and one without. Discard the one with the handle. With the remaining half, cut out four parallel, rectangular rib spaces in the transverse plane of the jug. The plastic that remains in between each space will serve as the bone. Cover the "bone" with masking tape to simulate the white color of the ribs and to cover any jagged edges in the plastic. Roll paper towels and place them over the "ribs". Using masking tape, tape these rolls tightly over each rib to simulate the three-dimensional feel of each rib. Flip the jug over so that you are looking at the inner aspect of the

"thorax". Place the clear packing tape longitudinally in order to cover the entire interior aspect of the cutout ribs. This tape serves as the pleura and allows the trainee to puncture through the pleura with the Kelly clamp. Lastly, flip the jug over back onto the other side. Lay a large sheet of construction paper over the outer aspect of the "thorax". This will serve as the skin. Draw important landmarks including the nipples and axilla and tape this to the water jug.

Outcomes & Evaluation: The water gallon chest tube model costs approximately \$15.00 USD. It is durable and reusable. The layering of materials allows the trainee to palpate and identify critical landmarks. The trainee is able to practice every step of chest tube insertion, from palpating the superior margin of the ribs at the nipple line over the mid axillary space to puncturing through the pleural cavity and sweeping a finger inside the thorax. The tape is durable and allows for several punctures through the pleural cavity. The model can be reset easily by placing a fresh sheet of paper over the thorax and replacing the clear packing tape. Limitations include the lack of lifelike tissues to simulate blunt dissection and inability to place surrogate fluid inside the thorax to be drained.

Going Forward: This model is inexpensive, durable and can easily be made from materials that are widely available in resource-poor countries.

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Abstract #: 02ETC036

Cancer genetics education in a low- to middle-income country: Evaluation of an interactive workshop for clinicians in Kenya

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Program/Project Purpose: Clinical genetics is becoming the standard of care in the treatment of many inherited disorders, including some forms of cancer. Retinoblastoma (Rb) is an aggressive early childhood cancer that affects families worldwide. Rb can be heritable or non-heritable, and subsequent treatment of the affected individual, his/her siblings and future offspring is impacted by this diagnosis. While genetic testing and genetic counseling are readily available in developed countries, in low- to middle-income countries such as Kenya genetic testing is limited and genetic counseling is virtually non-existent. Genetic testing is likely to become widespread in Kenya within the next decade yet there has not been a concomitant increase in genetic counseling resources. Our aim was to design an intervention to build capacity in Rb genetic counseling in the health care workforce in Kenya.

Structure/Method/Design: We developed a comprehensive workshop on Rb genetics geared towards physicians and other medical professionals working with the families of Rb patients in Kenya. The workshop took place in Sept 2013 during the Kenyan National Rb Strategy (KNRbS) meeting. Participants were KNRbS meeting attendees: ophthalmologists, pathologists, oncologists, ophthalmic clinical officers and nurses. The workshop included a presentation on Rb genetics, small group discussion of Rb patient case studies and genetic counseling role-play of case studies. We assessed Rb genetics knowledge of participants pre- and post-workshop using a multiple-choice test. One year post-workshop, the test was re-administered to workshop participants at the September 2014 KNRbS meeting. The primary outcome desired was increased Rb genetics knowledge immediately and one-year post-workshop.

Outcomes & Evaluation: Knowledge of Rb genetics significantly increased post-workshop (ANOVA, Tukey post-hoc, $p < 0.05$). The greatest increase in score was found in questions related to recent discoveries in Rb genetics. Post-workshop feedback surveys were generally positive, with participants indicating that they found the lecture material useful and relevant to their practices, and role-play an informative experience. Knowledge of Rb genetics one year post-workshop was not significantly different from the pre- or post-workshop results (ANOVA, $p > 0.05$), suggesting that knowledge retention of Rb genetics requires more frequent reinforcement.

Going Forward: Future research will include further analysis of the one-year knowledge retention test to pinpoint what aspects of Rb genetics are not being retained in the target population. This information will be used to refine the content of the Rb genetics workshop. More frequent implementation of the Rb genetics workshop, for example at each annual KNRBS meeting, will be considered.

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Abstract #: 02ETC037

Improving nursing and midwifery clinical education by developing local faculty mentoring capacity in Malawi

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Program/Project Purpose: Nurse Midwife Technicians (NMTs) play a critical role in Malawi's health workforce, particularly in the staffing of rural health facilities. In 2010, I-TECH conducted a needs assessment of Christian Health Association of Malawi (CHAM) colleges that train NMTs. A key finding was that NMT clinical instruction suffered due to inadequate supervision and support, and deficiencies in faculty clinical teaching abilities. In an attempt to address these gaps, I-TECH, in 2011, established a faculty mentoring program to strengthen faculty clinical teaching skills and address system issues that hinder the delivery of effective clinical teaching.

Structure/Method/Design: The program goal is to facilitate an environment for improved clinical teaching at CHAM colleges. Over three years, the program has evolved from relying on expatriate mentors to exclusively using faculty based at each college. Local mentors were selected through nominations from college administrations; records from previous mentoring rounds were referenced during selection. Mentors work side-by-side with tutors, clinical instructors, and staff at practicum sites to help address gaps in clinical teaching skills. Mentors documented progress through use of tools developed to assess mentee progress, administrative buy-in, and systemic challenges. In 2014, joint supportive supervision visits, facilitated by Ministry of Health, CHAM, Nurses and Midwives Council of Malawi, I-TECH, and technical expert representatives, were introduced to improve overall quality.

Outcomes & Evaluation: Initial analysis showed that systems and resource limitations have been significant barriers to successful programmatic uptake. Ongoing limitations include mentor attrition due to faculty transfers, resignations, and mentors' desire to work with projects that offer better remuneration. Additionally, mentors are challenged by lack of support from college administrators and balancing mentoring responsibilities with current workloads. Programmatic successes have been mixed. Some college administrators showed exceptional support, including by allocating college funds to the program. Three colleges have an active mentoring program, with 10 trained mentors and 22 mentees;

the remaining five have 18 mentors, but have not yet commenced implementation. The pilot evaluation showed that both mentees and mentors stated the program was helpful, but requested more frequent support from mentors and the supervisory team, respectively.

Going Forward: Ongoing interventions are required to increase the potential for success and long-term sustainability. Additional hands-on support to mentors and college administrators will be provided during quarterly joint supportive supervision visits, check-ins that focus on addressing issues identified during visits, and more frequent contact by email and phone. I-TECH will additionally train more mentors to address faculty mentor attrition across CHAM's network.

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Teach the teacher: Faculty development in Haiti

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Program/Project Purpose: A current priority of the Haitian medical establishment is to increase human resources for health via expanded medical and nursing training programs. Needs assessments have demonstrated a shortage of faculty with experience in program supervision and education. The Teach the Teacher (T3) program is a joint project between the University of Mirebalais Hospital (UMH) and the NGO Physicians for Haiti aimed at providing faculty development opportunities for medical and nursing faculty at UMH, and through this improving the quality of education for resident physician and nurses at the institution.

Structure/Method/Design: The T3 program combines small group teaching on topics in adult education and faculty development with direct observation of participants while they provide education to their trainees. To date, participants have been any UHM faculty (medical or nursing) who were free to participate within periodic week-long training sessions — we have had 5 such sessions over the first year (from September 2013 through September 2014) with an average of 16.75 participants per session. Long-term, the hope is that UHM faculty with particular interest in medical education will take on the role of running the T3 program, shifting non-Haitian roles to supportive ones. We also aim to scale up the program should it prove successful, rolling it out to other Haitian residency and nursing training locations in turn.

Outcomes & Evaluation: We have monitoring and evaluation data from the initial 5 sessions that demonstrate favorable short-term outcomes via anonymous pre/post knowledge testing and participant feedback forms. For those lectures with pre/post quizzes, 5 out of 6 topics demonstrated improvements in knowledge after teaching. Feedback from participants has also been consistently positive, with a broad consensus that these sessions are pertinent and important to their work in education.

Going Forward: The biggest challenge for the T3 program is ensuring value, both directly for the faculty participants, and on a programmatic level by showing that our efforts are leading to actual change in participant abilities. Our monitoring to date has been on an anonymous, program-level basis — this precludes long-term evaluation of participants. Our next