

Program/Project Purpose: El Salvador is one of three Central American countries with no emergency-trained physicians and one of five with no emergency-trained nurses (WHO, 2011). It has the lowest percentage of seriously-injured patients who are transported to hospital by ambulance (WHO, 2011). Given these statistics, there is a significant need for a comprehensive emergency response system, including trauma trained physicians and nurses and a functioning transport system. Emergency care is currently fragmented, with a lack of comprehensive emergency medical services, trauma training and high mortality related to traumatic injuries.

Structure/Method/Design: We met with hospital leadership from hospitals in San Salvador, El Salvador and offered Primary Trauma Care (PTC) training. Participating organizations included the Hospital Militar de El Salvador, Hospital Nacional San Rafael, Instituto Salvadoreño del Seguro Social and El Sistema de Emergencias Médicas (SEM). PTC provides a systematic approach to the management of trauma patients. It uses a sustainable train the trainer model and does not require access to high-tech facilities. The curriculum covers the evaluation of trauma patients, the primary and secondary surveys, priorities in resuscitation and stabilization. Simulation cases and skill stations allow participants to practice airway management, immobilization, insertion of intraosseous lines and tube thoracostomy (PTC Manual, 2014).

Outcomes & Evaluation: The first course included 38 participants and was conducted at Hospital Nacional San Rafael. It was led by three certified PTC volunteer instructors from Venezuela, Guatemala and Mexico. The course took place over two days. A registration fee was charged to cover the cost of flying the instructors to El Salvador. Glasswing International, a local non-governmental organization, and Hospital Nacional San Rafael provided materials including mannequins, intubation and immobilization equipment. The chest tube station was not offered during the first PTC training as the majority of the participants were surgeons with prior experience in tube thoracostomy. A focused assessment with sonography in trauma (FAST) station was offered instead. This was the first time a FAST skill station was offered at a PTC course in Latin America and the third time in the world. A multiple choice test written by PTC was administered before and after the training. Of those that past the post-test, 19 individuals were selected to complete an additional one day PTC instructor course.

Going Forward: The PTC training is a part of a larger program assessing trauma care delivery in El Salvador and the effect on critical outcomes such as door to operating room time and mortality. The new PTC instructors have started offering their own courses, and the su

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Applying classical learning theories to quality improvement interventions among mid-level providers in Kenya

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Program/Project Purpose: Quality improvement processes are important globally for strengthening health systems yet few studies have described educational methods to demonstrate quality improvement in non-western settings. This ongoing pilot describes a series of interventions rooted in classical learning theories that aims to improve quality across multiple metrics for a common primary care

diagnosis. Changing practice behavior of mid-level providers in Kenya provides novel insight to adult learning in Sub-Saharan Africa.

Structure/Method/Design: In this pilot, clinical leadership (stakeholders) at two private facilities deploy three brief interventions using different learning methodologies to improve diagnosis and management of urinary tract infections (UTI) among females ages 14-49. As per terms of employment, all mid-level providers (participants) attend brief interventions led by site-affiliate physicians, which last less than 45 minutes and occur on average every 2-3 months. The first intervention utilized processes from a behaviorist orientation, including a PowerPoint lecture to review a clinical practice guideline. The second intervention of peer-to-peer chart review followed by facilitated discussion incorporates processes of cognitive orientation (case examples/problem-based learning) and social learning theory (collaborative learning). The third intervention reveals locally relevant antibiotic resistance data followed by facilitated discussion. This adaptive learning process is rooted in the constructivist approach, which encourages providers to construct meaning of the data and implications for practice. Patient charts are scored before and after each intervention on a series of five metrics to evaluate desired educational outcomes of mid-level providers' guideline adherence. To ensure sustainability, clinical leadership will refine the onboarding process for newly hired mid-level providers using the findings of this pilot.

Outcomes & Evaluation: To date, the first educational intervention (behaviorist theory) has been performed at both sites. Preliminary results show significant improvement in quality metric scores in the diagnosis and management of urinary tract infections. Monitoring and evaluation of all UTI charts will continue throughout the duration of the pilot with subsequent interventions, and then of a representative sample per provider on performance reviews.

Going Forward: Brief theoretically-based interventions provide the basis for understanding mechanisms of learning processes among mid-level providers in Sub-Saharan Africa. The educational interventions utilized in this pilot move from passive transfer of facts to activ

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An orthopaedic clinic for osteomyelitis in Port-au-Prince, Haiti: Past experiences and the need for further epidemiological study

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Program/Project Purpose: Although seldom a life-threatening disease in developed countries, osteomyelitis poses a serious threat to life and limb in areas with inadequate resources to provide proper healthcare. Haiti is a country in which very little data exists regarding the prevalence and morbidity associated with osteomyelitis, though anecdotal evidence suggests the burden of the disease is severe. Reports indicate many chronic osteomyelitis patients require prolonged inpatient treatment due to a lack of available treatment resources and may take up a hospital bed for weeks or months at a time. Orthopaedic Relief Services International (ORSI) has provided infrastructural support to Hôpital de l'Université d'Etat d'Haiti (HUEH) to assist in establishing an osteomyelitis clinic staffed by local orthopaedic surgery residents over the past 2 years.

Structure/Method/Design: An osteomyelitis clinic adjunct to HUEH was established in an available facility space and stocked with preliminary supplies including antibiotics, debridement tools, and wound dressings. Two orthopaedic surgery residents and one attending physician from HUEH staff the clinic. The clinic is open once a week and receives referrals from the HUEH main hospital both pre- and post-surgically. An attempt to maintain a registry of incoming patients for follow up has been implemented. Currently, a framework for data collection utilizing the support of academic medical centers and involvement of medical students in Haiti and the U.S. for infrastructural support is being designed.

Outcomes & Evaluation: To date, approximately 100 patients have been treated in the Osteomyelitis clinic over the past two years. An estimated 10 patients are referred to and treated in the clinic with an average of 2 patients undergoing a surgical procedure related to their condition per week. Difficulties documenting patient follow up have prohibited more robust evaluation of clinical outcomes. The disproportionate disease burden on impoverished patients has presented serious challenges with regards to acquiring antibiotics and treatment supplies and has threatened the financial stability of the clinic.

Going Forward: Establishing a formalized, reliable method for data collection and patient follow-up is paramount. ORSI intends to implement a three phase plan moving forward: 1) An epidemiological and cost-analysis study in tandem with relief services 2) implementation

Funding: There is no established external funding source for this clinic.

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E-mentoring is effective and cost saving in resource limited settings

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Program/Project Purpose: Achieving and maintaining good quality of care in HIV programs is a significant challenge. On-site clinical mentoring has been recommended for building and maintaining healthcare worker (HCW) capacity at treatment sites. However limited numbers of qualified mentors, staff turnover, and changes in clinical guidelines create the need for more sustainable models. Electronic mentoring (e-mentoring) is a novel way of delivering case based learning and longitudinal co-management of patients by specialists and clinicians through the use of multipoint video-conferencing. This model has been shown to improve HCW capacity and lead to improved patient outcomes, but has not yet been shown to be feasible in resource limited settings.

Structure/Method/Design: We piloted e-mentoring to HCWs in HIV clinical sites in ten southern provinces of Vietnam. A multi-disciplinary team consisting of experts in infectious diseases, HIV, and family medicine was connected to clinical sites in the provinces with the use of cloud videoconferencing software and standard ADSL broadband. Participants utilized clinic computers and were provided with webcams, microphones, and LCD projectors when needed. Sessions were held every 1-2 weeks and included case discussion and didactic presentations. Cases were prepared by the provincial sites according to a standard format. Mentors provided recommendations on patient management following standard treatment protocols (e.g.

Vietnam HIV guidelines). We calculated the cost (per site reached) of e-mentoring compared to the cost of traditional on-site mentoring.

Outcomes & Evaluation: During a four month pilot from June through September 2014, 12 video-conferencing sessions were organized. On average, 42 HCWs from ten clinical sites joined each session. Each session included at least one didactic presentation and discussion of an average of three cases. Eighty-six percent (31/36) of participants surveyed rated the quality of the technology as either good or excellent. Excluding start-up costs, the cost per site reached through e-mentoring was \$17.5 per session. In comparison, a traditional on-site clinical mentoring visit to a distant province in southern Vietnam costs \$535.

Going Forward: E-mentoring is a feasible and cost-saving model for delivering HIV clinical mentoring and continuing medical education to HCWs in a resource limited setting. Lesson learned from this pilot will inform Vietnam's national strategy for HIV technical assist

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A pilot project for CPR instruction in urban Peru

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Program/Project Purpose: Cardiovascular mortality is the second leading cause of death in Peru. However, first responders and health care professionals who are likely to encounter situations requiring resuscitation do not consistently have access to cardiopulmonary resuscitation (CPR) instruction. To this end, we conducted CPR presentations at an urban clinic in Peru. We utilized post-intervention surveys to determine the effectiveness of this intervention. The aim of this project was to improve the knowledge of and confidence with CPR for first responders and to assess the impact of intensive practical CPR sessions on knowledge of and willingness to perform CPR.

Structure/Method/Design: Interactive, practical 30-minute CPR presentations were conducted over the course of 2 weeks at an urban health clinic in Peru. Target audiences included emergency and health care workers and educators who were referred to our program by local physicians and hospital employees. Classes were conducted primarily by medical students under the supervision of physicians. To ascertain the existing level of basic CPR knowledge, participant's willingness to perform CPR and the impact of our presentation, we performed pre- and post-surveys. Changes in knowledge level and participant's perceptions of CPR were analyzed by paired t-test and McNemar's test. Continued partnership with local Peruvian organizations will allow the project to continue in future years at the same clinic. The goal will be to expand the pilot program and implement a train-the-trainer model to ensure sustainability.

Outcomes & Evaluation: Participants (n = 100) had a high level of basic knowledge prior to the presentation and demonstrated a statistically significant increase in knowledge after the presentation (pre-test = 88%, post-test = 94%; p < 0.01). There was an improvement both in willingness to perform CPR (pre-test = 80%, post-test = 92%; p < 0.001) and in their confidence with recognizing a situation requiring CPR (pre-test = 76%, post-test = 92%; p < 0.001).

Going Forward: CPR presentations increased participant's self-reported willingness to perform CPR and ability to recognize when