

Addressing WHO Resolution 60.22: A Pilot Project to Create Access to Acute Care Services in Uganda

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The World Health Organization's (WHO's) 2007 Resolution 60.22 tasked the global health community to address the lack of emergency care in low- and middle-income countries. Little progress has yet been made in integrating emergency care into most low- and middle-income-country health systems. At a rural Ugandan district hospital, however, a collaborative between a nongovernmental organization and local and national stakeholders has implemented an innovative emergency care training program. To our knowledge, this is the first description of using task shifting in general hospital-based emergency care through creation of a new nonphysician clinician cadre, the emergency care practitioner. The program provides an example of how emergency care can be practically implemented in low-resource settings in which physician numbers are limited. The Ministry of Health is directing its integration into the national health care system as a component of a larger ongoing effort to develop a tiered emergency care system (out-of-hospital, clinic- and hospital-based provider and physician trainings) in Uganda. This tiered emergency care system is an example of a horizontal health system advancement that offers a potentially attractive solution to meet the mandate of WHO 60.22 by providing inexpensive educational interventions that can make emergency care truly accessible to the rural and urban communities of low- and middle-income countries. [Ann Emerg Med. 2014;■:1-8.]

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INTRODUCTION: CHALLENGES TO EMERGENCY CARE IN LOW-MIDDLE INCOME COUNTRIES

In 2007, the World Health Organization (WHO) adopted Resolution 60.22, Health Systems: Emergency Care Systems, highlighting the paradox between the dire need for emergency care and the almost universal void in emergency care services in low- and middle-income countries. This resolution called for allocation of resources to improve access to emergency care and for collaborations between nongovernmental organizations, governments, and “other stakeholders” to build and monitor emergency care capacity. Unfortunately, to date, there has been little progress on 60.22.¹⁻⁴

There is limited time to successfully intervene when a patient becomes acutely ill or injured. Because patients cannot “choose” where to have an emergency, effectively addressing 60.22 entails making emergency care accessible to all members of the population at all times and properly training providers in emergency care. To accomplish this, countries must not only establish emergency care at the referral hospitals but also design an emergency care system that fills this void throughout all levels of the existing health system. This has the potential to strengthen the country's national health system by improving delivery of all care and reducing morbidity and mortality from common diseases, providing secondary prevention, improving capability for disease surveillance, and strengthening disaster preparedness.

Universal provision of quality emergency care is challenging, especially in a system with limited human resources for health.

There is an overall physician shortage in low- and middle-income countries, which is most severe in rural areas. Currently, sub-Saharan Africa carries 25% of the world's disease burden, yet it has only 3% of the world's health workforce and spends only 1% of the world's health care dollars to address this overwhelming burden.⁵ By 2015, it is estimated that sub-Saharan Africa alone will face a shortage of 420,000 physicians.⁵ Nonphysician clinicians, however, are more numerous in most countries. For example, in Uganda in 2007, there were 21.2 nonphysician clinicians compared with 4.7 physicians per 100,000 population.⁶ Additionally, physicians require longer training times (in Uganda physicians train for more than twice as long as nurses and twice as long as nonphysician clinicians) and significantly higher training costs than other health workers.⁶ In Kenya, for example, total costs for nursing school are roughly half that of medical school.⁷ Therefore, staffing rural facilities with physicians to provide emergency care is unlikely to be a feasible solution, given the human and financial resources available for health care in low- and middle-income countries.⁵

Because of these shortages, the assessment, stabilization, diagnosis, and treatment of acutely ill or injured patients usually falls to nonphysician clinicians. These providers are often nurses untrained in emergency care or in medical decisionmaking. In rural settings, in which the physician deficit is even more severe, a nonphysician clinician will often be the first, and perhaps only, provider to care for these patients. This concept, called “task shifting” (in which services/tasks traditionally provided by a physician are “shifted” to be provided by nonphysicians), can be

effective with proper training, political will, and financial backing to support developing these clinicians.^{6,8} Although task shifting has proven successful in HIV care, surgical care, and obstetrics (ie, vertical or disease/condition-specific programs), to our knowledge there are no reports of outcomes in general emergency care settings (ie, horizontal programming that aims to improve health in patients with any cause of illness).⁹

Here we describe an education and training model for emergency care delivery focused on nonphysician clinicians as the primary emergency care providers in a rural low-resource setting. This initiative represents a collaboration between a local health facility, a nongovernmental organization (Global Emergency Care Collaborative), academia, and the Ministry of Health of a low-income country. It has been argued that to address WHO 60.22, such collaborations are critical.¹⁰ However, there have been a total of only 11 reports of such collaborations described in the literature, all of which focus on physician training in urban areas.¹¹⁻¹³ We also discuss the ongoing assessment of the model's effectiveness, outline a plan for replication and expansion, and identify key components of public-private partnerships required for the program to sustainably affect Ugandan health care delivery. Finally, we discuss an action plan for creation of a tiered horizontal emergency care system that has the potential to fully meet WHO 60.22's mandate and strengthen the health system as a whole.

BACKGROUND: EMERGENCY CARE IN UGANDA

Although emergency care will clearly benefit both pediatric and adult patients, its greatest effect may be on child mortality rates, which are typically 10 to 20 times higher in low-income countries compared with high-income countries. In Uganda, more than half of mortality in children younger than 5 years is due to malaria, diarrhea, respiratory illness, neonatal sepsis, and trauma.¹⁴ For each disease, timely and appropriate treatment will significantly reduce morbidity and mortality. The Ugandan

Table 1. Priority clusters, Health Sector Strategic and Investment Plan 2011 to 2015.

Cluster	Details Related to Acute Care
Health promotion and disease prevention	Disaster preparedness; reduce morbidity and mortality from diarrheal disease; detect and respond to health emergencies
Prevention, management, and control of communicable disease	Mitigate the medical and person effects of HIV and other STIs; reduce the morbidity and mortality of malaria
Prevention, management, and control of noncommunicable disease	Reduce morbidity and mortality from COPD and asthma; decrease morbidity and mortality caused by injuries
Maternal and child health	Reduce morbidity and mortality related to reproductive health; scale up cost-effective child survival interventions

STIs, Sexually transmitted illnesses.

Ministry of Health recognizes emergency care as a priority. In its Health Services Strategic Plan II (2005 to 2010), the Ministry set the goal of opening emergency departments (EDs) in rural district hospitals and regional referral centers.¹⁵ However, few EDs currently exist, and those that do are generally not functional or adequately staffed. Emergency care can at least partially address all 4 "priority areas" recently identified by the Ministry of Health (Table 1).¹⁶ Although several short courses in emergency care have been taught to laypersons and more recently to physicians, currently there is no formal or recognized emergency care education for any level of health provider in Uganda, including physicians.^{17,18}

In June 2008, the Karoli Lwanga Hospital (resources description in Table 2) opened the first rural ED in Uganda. The ED has 6 beds, treats 300 to 700 patients per month, is staffed by the trained nonphysician clinicians described in this article, and has bedside ultrasonography available for immediate imaging by

Table 2. Description of resources at Karoli Lwanga Hospital.

Service or Characteristic (N)	Hours Available	Notes
Bed capacity (150)	n/a	Includes pediatric, adult, and maternity
Nurse/midwife staffing (88)	n/a	Wards staffed by 1–2 nurses and variable number of nursing students. Night coverage of 1 nurse per 2 wards.
Physician staffing (3–4)	Daytime, on call	No specialty training
Clinical officer (3)	Daytime, on call	Roughly equivalent to a physician assistant
Nurse anesthetist (1–2)	Daytime, on call	Ketamine; ether or halothane can be used by bellows
Operating theater (2)	Daytime; 1 team on call	No trained surgeon available. General and gynecologic cases performed. No neurosurgical, vascular, or major orthopedic capability.
HIV clinic	One day/wk	Sponsored by various US government grants
ICU	None available	Critical patients cared for on general ward, no ventilators
Radiography	Daytime; sporadic on call	Ultrasonography and radiograph only
Laboratory	Daytime; on call	Hb, blood grouping, UA, urine pregnancy test, blood slide for malaria, blood sugar, CSF analysis, HIV rapid testing, CD4 count (delayed turnaround), brucellosis antibody, Widal test (typhoid)
Internet access	Initially sporadic, now available by cell telephone modem	No electronic records or computers positioned on wards

Hb, Hemoglobin; UA, urine analysis; CSF, cerebrospinal fluid.

providers. A consecutive sample of the ED patients highlighting common emergency conditions was published elsewhere.¹⁹ Although resources are limited, the majority of patients are managed on-site because they cannot afford transport to the regional referral hospital, even if it is indicated.

Before the inception of the ED, care was provided in a manner typical of district hospitals in sub-Saharan Africa.²⁰ The outpatient department was staffed by either a clinical officer (equivalent to a physician assistant) or a physician, and patients were treated during typical business hours. No formal triage system was used; patients with acute complaints waited in the same queue as those with nonurgent problems. Patients requiring admission were sent to the wards with medication orders and a management plan. Often, there were significant treatment delays. When the outpatient department was closed, a hospital watchman was responsible for directing patients to the appropriate ward, regardless of acuity of presentation. On-call clinical officers and physicians were not required to remain in the hospital. If laboratory or radiographic investigations were needed off-hours, staff had to be called to report back to the hospital. Given the paucity of these support staff, long delays from patient arrival to formal evaluation and definitive treatment were common, which undoubtedly worsened patient outcomes (unpublished data).

THE EMERGENCY CARE PRACTITIONER PILOT PROJECT

Review of district health resources indicated that nurses were 10 to 20 times more plentiful than clinical officers or physicians.²¹ Thus, the most sustainable model for providing accessible acute care at this site was to rigorously train nurses to be the first-line providers. Because these providers would assess, diagnose, and treat acute care patients without direct physician oversight, such training creates a new cadre of health providers specifically specializing in emergency care, which we have termed the emergency care practitioner. The Ugandan physicians and Ministry of Health officials involved in the development and revision of the program thought that this term would most accurately reflect to Ugandan health workers the level of care these practitioners provide. The goal is to have graduated emergency care practitioners practice independently, performing patient assessment, ordering testing, and initiating treatment without the need to involve the hospital physicians.

OVERVIEW OF TRAINING MODEL

Although the use of nonphysician clinicians to provide emergency care has been reported from high-resource settings, to our knowledge there is no published curriculum for nurses to independently provide emergency care in resource-limited settings.²² Thus, a new curriculum was developed. Curriculum content was generated from 3 sources: a needs assessment, international consensus on essential skills and knowledge, and expertise from board-certified emergency physicians with experience working in this setting.^{19,23,24}

The resultant 2-year emergency care practitioner program is based on a train-the-trainer model, incorporating graduated clinical and educational responsibilities. The first year of the program focuses on training in basic aspects of emergency care. The second year includes training to be an instructor and stresses more advanced diagnostic and management skills and public health concepts (Figure 1). During the second year, trainees give lectures and tutorials under supervision of fully trained emergency care practitioners or emergency physicians and participate in research and quality improvement projects.

SPECIFICS OF THE CURRICULUM

The curriculum combines clinical teaching, traditional didactic classroom lectures, simulation, and procedural skills training laboratories in parallel. The core competencies and proficiency standards incorporated in the curriculum were adapted from Uganda's consortium of 5 medical schools named Medical Education for Equitable Services to All Ugandans and the US's Accreditation Council for Graduate Medical Education Outcome Project.²⁵⁻²⁷

Clinical Teaching

The cornerstone of the emergency care practitioner course is bedside learning. Each student spends 40 hours per week learning history taking, physical examination, medical decisionmaking, and procedural skills while caring for patients under close supervision in the ED. During the inaugural year of the program, clinical supervision was provided by board-certified emergency physicians. In subsequent years, clinical supervision has been provided by Ugandan emergency care practitioners who are in their second year of training ("senior" emergency care practitioners) or emergency care practitioner program graduates ("qualified" emergency care practitioners), with assistance from emergency physicians. Emergency care practitioner instructors provide bedside teaching and feedback on patient assessments and clinical decisionmaking. This method is analogous to physician residency training in high-income countries. This longitudinal exposure to patient care and progressive increase in responsibility are the foundation of the emergency care practitioner program.

Integral to this, emergency care practitioners learn crucial procedural skills. Direct supervision during procedures is provided until each trainee has achieved competency in the particular procedure. To become accredited in a given procedure, a student must perform a number considered sufficient in other emergency care training programs and demonstrate that he or she is performing the procedure with proper technique and adequate competency. The core procedural skills are listed in Figure 2. Procedures are currently learned at the bedside because no high-fidelity simulation is available.

Didactic Lectures

An obvious obstacle to training nurses to function as independent providers is their lack of detailed knowledge of

Year 1: Fundamentals of Emergency Care for Junior Student ECPs

Symptom-based didactic lectures and case-based conferences, approximately 3 h/wk

Bedside care with clinical teaching, supervised by senior student ECPs or by qualified ECPs

Integrated interactive low-tech simulation, hands-on skills workshops, and oral case-based learning modules

Written and oral examinations throughout the year

Regular feedback meetings with the program director to assess and monitor progress through the course, with an emphasis on knowledge acquisition and patient care skills

Year 2: Trainer Mentorship and Advanced Emergency Care for Senior Student ECPs

Junior student ECP trainees become senior student ECPs and teach the ECP student portion of the course to next class of junior student ECPs

Senior student ECPs take ownership of curriculum (didactic, simulation, and bedside teaching)

Professional and educational mentoring by GECC program specialists and physicians, and qualified ECPs

Participate in 4 wk of advanced clinical rotations at local university (planned)

Continuation of integrated interactive low-tech simulation and oral case-based learning modules for further honing of skills

Regular feedback meetings with the program director to assess and monitor progress through the course, with an emphasis on teaching skills health care delivery in the ED

Computer skills, including making PowerPoint presentations, using basic database and word processing programs

Preparation and presentation of morbidity and mortality lectures

Participation in ongoing research projects

ECP, Emergency care practitioner; *GECC*, Global Emergency Care Collaborative (nongovernmental organization that directs the training).

Anesthesia

Procedural sedation with ketamine (10)

Neurologic

Lumbar Puncture (10)

Ear nose and throat:

Foreign Body Removal (5)

Nasal packing for epistaxis (2)

Orthopedic

Open and closed fracture reduction (10)

Reduction of dislocations (10)

Splinting (10)

Pelvic Binder (using bedsheet technique) Placement (2)

Surgical:

Abscess drainage (including pyomyositis) (5)

Laceration repair (15)

Wound debridement (5)

Burn wound management (5)

Beside Ultrasound:

Extended FAST exam (25)

Trans-abdominal assessment of pregnancy (25)

Gallbladder (25)

Cardiac (25)

Soft tissue (10)

Renal (25)

Figure 2. Examples of procedural skills taught to emergency care practitioners (approximate number needed for competency).

threatening. Didactic lectures, in Microsoft PowerPoint format, focus on common core emergency care topics in a symptom-focused assessment process (Table 3). Each begins with relevant anatomy and physiology, reviews the key components of the history and physical examination, progresses to the formation of differential diagnoses and the interpretation of necessary test results, and finally discusses management. Lectures were developed by Global Emergency Care Collaborative physicians, with input from the hospital medical superintendent, faculty from Mbarara University of Science and Technology, and the Ministry of Health.

A course handbook was developed (each chapter mirrors a didactic lecture for additional depth) and is provided to each junior emergency care practitioner at the start of the course.

Table 3. Sample lecture topics.

Sample Lecture Title	Examples of Topics Covered
Telling sick from not sick	Signs of serious illness, physical examination and assessment of unstable patients, shock (types described), fluid resuscitation
Chest pain	Angina, pericarditis, pneumothorax, pneumonia, TB, empyema
Fever	Malaria, TB, brucellosis, typhoid, pneumonia, urinary tract infection, amoebic liver abscess, measles, meningococemia, dengue, leptospirosis, acute rheumatic fever
Unresponsive patients and altered mental status	Calculation of GCS score, sepsis, CCM, poisoning, hypoglycemia, seizures, stroke, intracranial hemorrhage

TB, Tuberculosis; GCS, Glasgow Coma Scale; CCM, cryptococcal meningitis.

Figure 1. Summary of 2-year emergency care practitioner program.

pathophysiology. This obstacle is more significant in the acute care setting, in which patients present after decompensation from undifferentiated illnesses and injuries that are often life and limb

Junior emergency care practitioners are the primary students of the didactic lectures, whereas senior emergency care practitioners are the primary instructors (they are taught computer and teaching skills to administer lectures). Seniors also have bimonthly continuous medical education classes and tutorials with emergency physicians or qualified emergency care practitioners to refine lecture techniques and learn to become educators. Formal lectures are supplemented with other didactic modalities for educational enrichment and quality assurance. These other didactic forums include focused patient case-based conferences, oral and written quizzes, and continuous quality improvement meetings.

Simulation Training, Skills Workshops, and Research

The third major component of the curriculum uses low-fidelity simulation to reinforce key clinical points, review important but less common disease processes, and build teamwork and leadership skills. Studies have demonstrated better performance and higher retention rates when simulation is used compared with strictly traditional didactic methods of medical training.^{28,29} Medical simulation enables providers to learn, practice, and repeat procedures in a nonthreatening environment. This, in turn, provides an opportunity for deliberate review, feedback, and skills strengthening in a way that is hard to fully create in a busy ED. Examples of simulation scenarios are given in Table 4. Images (ie, positive focused abdominal sonography of trauma examination result) are made available and used as supplemental material according to the scenario being simulated. In each additional offering of the course, simulation has been increasingly used and integrated into the main curriculum, so additional simulation modules are still under development.

Training in research is also being integrated into the curriculum. Nurses in Uganda are not required to participate in research as part of their basic education, so emergency care practitioners are taught basic research concepts through discussion of relevant published articles and participation in

projects being used to evaluate the program.^{19,30} Lectures on basic research concepts are being formally introduced into the curriculum, and emergency care practitioners are encouraged to take more of a leadership role, including presenting research at regional conferences. Additional plans include mentoring emergency care practitioners in the role of lead author on projects of their interest related to emergency care.

Student Assessment

The emergency care practitioner trainees' progress in the competency-based curriculum is monitored by a program director through feedback and observations from all training staff and from a number of assessment tools. During the first year, assessments of knowledge attainment and use are performed with a pretest, written quizzes, monitoring of required procedure logs and patient follow-up logs, and a summative written examination. Written quizzes incorporate topics from a series of lectures and are given periodically throughout the course. To pass the posttest written examination, which is based mostly on clinical case scenarios and multiple-choice didactic questions, students must score a minimum of 80%. Those scoring between 70% and 79% are given an oral case-based remediation test or offered additional time to study and receive clinical supervision. Functional decisionmaking and clinical care are assessed by visiting emergency physician direct feedback (ie, at the bedside) on clinical performance, monthly program progress forms, and formal summative written evaluations by each visiting emergency physician. Objective assessments (quizzes, examinations, case logs, procedure logs) form the majority of the final assessment grade, and functional assessments comprise the remainder. Emergency care practitioners in the second year of training practice each didactic lecture with the visiting emergency physician before presenting to the students and receive direct feedback in a standardized format assessing their lecture delivery and student understanding of material. Second-year functional assessments of clinical care, systems use, professionalism, and teaching ability are performed by direct bedside feedback and monthly standardized progress forms.

Outcomes Monitoring

A quality assurance database was created to allow routine follow-up and evaluation of patient outcomes. Every ED patient is entered into this database (currently includes nearly 20,000 patients), which contains demographic information, resources used for care, procedures performed, diagnosis, and patient contact information. Informal reviews of the database indicated that 65% to 70% of patients supply a telephone number to data collectors. Beginning 72 hours after the ED visit, each patient is called and asked a scripted series of questions to determine overall condition. Admitted patients are followed up on the ward, with a patient interview and review of clinical progress notes. There is no standard method of follow-up for patients treated in acute care settings in low-income countries; this follow-up scheme was devised to assess outcomes of this intervention. Mortality is the major outcome being tracked. Examples of other clinical

Table 4. Examples of simulation scenarios and skills emphasized.

Case Scenario	Learning Objectives
Pediatric burn injury	Proper fluid resuscitation for burn victims, tetanus prophylaxis for burn victims
Pediatric respiratory distress	Recognition of danger signs of respiratory distress, administration of oxygen, proper antibiotic coverage for pneumonia
Ectopic pregnancy	Recognition of various presentations of ectopic pregnancy, pregnancy testing in women with abdominal pain or vaginal bleeding, use of bedside ultrasonography to aid in diagnostic evaluation, activation of early operative care
Adult trauma scenario	Diagnostic evaluation of blunt abdominal trauma in resource limited settings, use of bedside ultrasonography in evaluation of blunt abdominal injury, proper use of blood in resuscitation of unstable patients with blunt abdominal injury, appropriate activation of operative resources

outcomes include malaria case-fatality rates, ultrasonographic diagnostic accuracy, trauma surveillance, and rates of HIV screening and complication rates for specific procedures.³⁰ These methods of follow-up and outcomes have been, or will be, reported separately. Although this is a single site and it is impossible to ethically randomize acutely ill patients to emergency care or standard care, assessment of effect can be measured by comparing mortality rates from emergency care practitioner-treated patients to admitted age-matched cohorts in other reports from sub-Saharan Africa.^{31,32}

REPLICATION OF THE EMERGENCY CARE PRACTITIONER TRAINING MODEL

The program is being integrated into the course offerings of a local university, Mbarara University of Science and Technology. This integration has been formally approved but is nascent and currently in name only. If successful, this would facilitate replication of the training at additional clinical sites within Uganda. To maximize the training capacity, the concept of having several clinical sites for primary instruction remote from the university is under consideration. Specific rotations and didactic sessions would be held periodically at the university campus. Given multiple confounding factors (ie, funding for development of EDs at district hospitals or formal recognition of the emergency care practitioner cadre), an exact timeline has not been developed. This will be a major step toward transferring control and administration of the program to Ugandan stakeholders. Ongoing support of the program by foreign-trained emergency providers will continue until the university has the capacity to manage the program independently.

DISCUSSION

Anderson et al¹⁰ called for collaborations between governments, health facilities, academia, and nongovernmental organizations to develop emergency care in response to WHO resolution 60.22. Additionally, Hirshon et al³³ called for the development of models for emergency care in low- and middle-income countries. The emergency care practitioner training program is one such model and represents an example of a public-private partnership, such as suggested by Anderson et al,¹⁰ that introduces horizontal health programming into a low-income country. This program is unique in its approach and in its aim to fully integrate into the Ugandan health care system at all levels (local provision of care, higher education, and health systems capacity building). Additionally, as a horizontal program, this initiative will provide care to all patients having emergencies, including patients cared for in vertical programs. This approach has many strengths. It builds capacity of a health care cadre that is relatively plentiful in rural and urban areas in most resource-limited countries and imparts them with knowledge and expertise to provide quality emergency care to populations that otherwise would not have access to it. Additionally, the educational model has a structure that will allow sustainability and scalability within the current health sector model.

There are several potential solutions to the challenges currently impeding emergency care development. These challenges are universal to most, if not all, low-income countries. First, emergency care does require some initial funding to become established, and in these settings, health care budgets are limited. However, emergency care, like surgical care, is an economy of scale; the most significant costs are on startup, and once emergency care is established, the fixed costs are shared and the cost per unit service decreases.³⁴ The horizontal nature of emergency care development presents funding and research challenges because it will be difficult to determine causality for improved population health outcomes: the intervention does not focus on a single disease or patient demographic (eg, HIV-positive patients, women of childbearing age). Additionally, patients will experience emergencies regardless of the amount of preventive services in place, so resources required for care will be consumed irrespective of whether providers are trained in emergency care. Funding these startup costs (training and infrastructure) could improve efficiency and quality of care and reduce costs in the long term. Because emergency care can successfully complement vertical programs and deliver public health interventions that are part of the larger health sector strategy, governments and funders should consider devoting some money designated for other programs (eg, HIV care, malaria control and vaccination programs) toward developing emergency care.^{35,36} Rather than detracting from the work of these programs, funding emergency care would protect the investment the vertical programs make in patients' well-being because their emergency care needs would be addressed, minimizing morbidity and mortality from illness and injury related to (or unrelated to) their chronic condition addressed by the vertical program.

Nonetheless, the overall effect on any given vertical program may take a while to become apparent. Tracking easily identifiable outcomes (eg, mortality, morbidity from complications, ability to return to work, satisfaction with care) of patients cared for in the acute setting can highlight numbers of patients in a given demographic, or with a given disease, who benefit from emergency care. The outcomes can be compared with those of patients in regions of the country that still do not have access to emergency care or can be compared with historical controls with a given disease.

Second, the ever-present human resource challenge is exacerbated when care is required continuously, thus demanding an increased number of providers to ensure adequate coverage. By using task shifting, this program should cost less to run and be more rapidly scalable, given lower costs and shorter time to train nonphysician clinicians.⁹ Training physicians to fill these posts would require significantly increasing the output of local medical schools and would take decades longer to generate a comparable number of providers, at a much greater expense. By task shifting the emergency care to nonphysician clinicians in rural areas, the program addresses the need to provide emergency care to this population in a potentially sustainable manner. This program will not eliminate the need to train physicians in emergency care

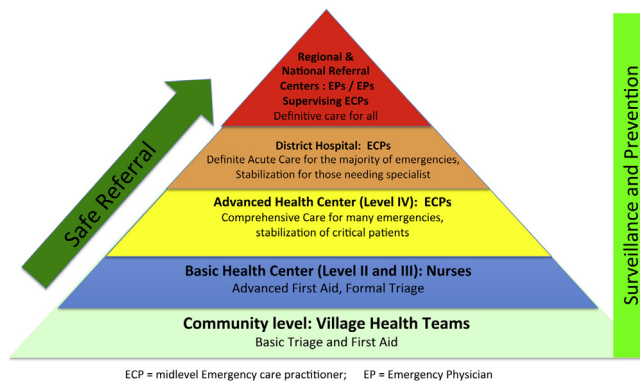


Figure 3. Tiered emergency care system adopted (with permission) from the African Federation for Emergency Medicine.

in these settings. On the contrary, the overall model plans for a tiered approach to a horizontal emergency care system that includes parallel and integrated physician training, emergency care practitioner training, and community education. Physicians will be needed to staff EDs in higher-volume referral centers that receive more complex patients and have the resources to treat a much wider range of emergencies (Figure 3). These emergency physicians can coordinate with district health officers to provide indirect oversight and continuing education to the emergency care practitioners in rural districts. Additionally, these physicians can become the primary educators of the emergency care practitioners through local universities.

Third is the quality of emergency care the emergency care practitioners can provide. Although task shifting in many surgical and medical disciplines has been shown to be a feasible means of providing effective care, to our knowledge there are no previous articles describing task shifting for hospital-based emergency care in low-income countries. However, some skills, such as patient assessment, test ordering, and initiation of care by nonphysician clinicians, have been shown to be feasible in other settings.^{37,38} We are performing an ongoing rigorous assessment of this model to monitor quality of care delivered.

Fourth, developing local support for the concept of emergency care and agreement on the manner and method to provide it are critical. A program that is entirely foreign-driven without “local champions” is unlikely to succeed. For the emergency care practitioner program, the hospital leadership is in strong support of the program locally, key members of the faculty at Mbarara University are advocating the program, and the Ministry of Health, which is supportive of task shifting in general, believes that this innovation of task shifting for emergency care holds strong promise. To replicate the program, this support will need to continue to expand; hence, transferring leadership to Ugandan physicians and educators is the critical next step. In a similar vein, programs such as this will be successful only if run on a relatively low budget and with financial efficiency (which this program is) so that the costs can be effectively weaned to local resources and eventually be entirely supported by the local or national health infrastructure. If the program is not implemented

in a financially feasible manner from the beginning, sustainability of the program will be unlikely.

Fifth, in countries in which task shifting to nurses is not deemed acceptable or desirable, task shifting to other midlevel providers (such as clinical officers) may provide similar benefits.

FUTURE DIRECTIONS AND CONCLUSIONS

The emergency care practitioner program is one component of a tiered emergency care system proposed for Uganda (Figure 3). Other aspects requiring ongoing development are training of village health teams and local clinic providers in basic emergency care, and physician training in general and specialist level emergency care. Taken as a whole, the proposed tiered emergency care system being developed in Uganda represents a potential method to fully address WHO resolution 60.22 by creating sustainable emergency care services that would be available in both rural and urban areas and maximize use of available human resources for health. At the core of this model is the goal that Ugandan health and education systems will gradually assume responsibility and management of the program, with involvement of foreign emergency physicians being phased out over time. While the pilot district hospital phase is established, replicating the model is crucial to demonstrate its scalability. Additionally, further evaluation of the program influence and cost-effectiveness is required. The program offers a potentially attractive solution to meet the mandate of WHO 60.22 by providing an inexpensive educational intervention to make emergency care truly accessible to the people of low- and middle-income countries.

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