ENCOURAGING ACTIVISM IN GLOBAL HEALTH THROUGH KNOWLEDGE, INNOVATION AND ENGAGEMENT

Strengthening Links in the African Chain of Survival

Nee-Kofi Mould-Millman, M.D., Assistant Professor of Emergency Medicine at the University of Colorado School of Medicine focuses his efforts in research, development and advocacy in Ghana..

Neighbors and shopkeepers are trickling into the street, curious about the crash they heard moments earlier.

At the next intersection a mangled, smoking wreck points to the cause – a two-car collision. A few men approach the vehicles, looking for survivors.

The well-meaning bystanders yank a victim through an open car window. After a quick glance at his condition they manage his unconscious, bloody body into the back seat of the nearest taxi.

The taxi driver hurriedly transports the unaccompanied patient to the nearest health outpost, about five miles away.

With no pressure or tourniquet to stanch the blood flowing from his arm and thigh, the patient dies before reaching the facility.

This is a common daily scenario in many sub-Saharan countries. In the absence of formal emergency medical services, taxis and personal vehicles informally often fill the role of ambulances. However, there is no substitute for the early care provided at the scene of an incident.

The Emergency Care Continuum

A global emergency care advocate recently joined the CU Anschutz Medical Campus, Nee-Kofi Mould-Millman, M.D.

In a recent paper, Dr. Mould-Millman described an overarching principle of out-of-hospital emergency care; “As a chain of survival, an emergency care system is only as strong as its weakest link.”¹

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At 3:45 a.m. on a chilly Saturday morning in January in the lobby of Children’s Hospital Colorado, a team of 18 doctors and nurses waited behind the front doors, each carrying two large suitcases. After two buses arrived, the team slowly boarded and carefully loaded the heavy suitcases into the back of the bus.

Each year, Children’s Hospital Colorado sends surgical teams to Guatemala City to help some of its most needy children. The inaugural mission took place in January 2012, and since then, teams of 14-18 members including anesthesiologists, surgeons and nurses, assist both in surgery suites and operate a Post Anesthesia Care Unit (PACU).

Surgeries include Ear, Nose and Throat (ENT) (2012); general pediatric (2013 and 2014); and plastic reconstruction (2013 and 2014).

Procedures include cleft/lip palate; tonsillectomies; hernia repair; cyst/mass removals; treatment for undescended testicles; microtia repair; and burn repair.

Patients range in age from 5 months to 18 years. On average, approximately 45 patients are treated during the team’s one week stay.

The team starts preparing for its mission long before the annual January departure date.

As they bring every piece of equipment and material they will use while there, they must begin procuring supplies at least six months in advance. Project CURE, a Denver-based non-profit organization, has been instrumental in assisting with this process.

The teams make an annual visit to the Project CURE warehouse to collect donated supplies.

Once a year Children’s Hospital Colorado partners with Moore Surgical Center, located in Guatemala City, to perform much-needed surgeries on children who have traveled from all over Guatemala requesting their services.

Once the supplies have been procured, the team packs them into large suitcases.

The team coordinator photographs the baggage tags and coordinates with the Moore Pediatric Surgical Center support staff on the ground in Guatemala City to ensure the customs process runs smoothly upon arrival. The safe transport of these cases is of paramount importance.

The Moore Surgical Center, established in 2011, is a 12,000 square foot facility offering three operating rooms, four pre-op beds, 21 recovery beds, nursing station, pharmacy, and family waiting areas. It is professionally staffed with nurses and support staff.

The facilities are modern and high-quality, enabling the visiting teams to complete surgeries without a great deal of compromise.

The Moore Center also recruits a pharmacy student from the Pharmacy School of Belmont University (Nashville, Tenn.) to run the pharmacy for each visiting team.

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This statement emphasizes that out-of-hospital emergency care occurs on a continuum, beginning with bystander action following an incident, on the roadside or in a school, and concluding in definitive care (usually, but not always, in a formal medical facility).

The processes between the beginning and end points necessarily vary by location and by locally available resources.

In sub-Saharan Africa, where Mould-Millman focuses his efforts in research, development, and advocacy, there is a dearth of data related to prehospital care. "Although no Africa-wide emergency medical services (EMS) inventory or assessment has been conducted, available data suggest the existence of only a few formal prehospital care systems in various stages of development, distributed among only a few countries."  

More data from sub-Saharan countries are required to quantify need, improve existing systems, and develop new systems. As such, Dr. Mould-Millman is currently leading a multi-national, multi-institutional research team to conduct the first comprehensive Africa-wide inventory.

Prehospital data is exceedingly difficult to collect, and prehospital outcomes research should be given a high priority. Mould-Millman explains why, "It's a challenging field to test outcomes of interventions or existing processes because prehospital variables, such as bystander response times or ambulance clinical data, are poorly documented. Further, outcomes of prehospital-transported patients are most often recorded in healthcare facilities. Merging and analyzing bits of data from multiple chaotic settings makes it difficult to quantify which link in the chain actually conferred the positive or negative outcome."

Within the prehospital care system, there are distinct elements such as communication and transportation that are easier to study in isolation, but doing so detracts from understanding the overall strengths and weaknesses of a response system and how they impact patient's outcomes.

In a low-resource setting, it is important to maximize patient outcomes, in a sustainable way, for the least possible development dollars.

“...”

Dr. Nee-Kofi Mould-Millman believes that sub-Saharan prehospital care systems can and should be developed and integrated with facility-based systems. Pre- and in-hospital phases of care are separate but related, and if harmonized, prehospital emergency care systems can both conserve and enhance critical resources at the facility-level.

First and Second Tier Responses

Dr. Mould-Millman is the lead for the Out-of-Hospital working group within the African Federation for Emergency Medicine (AFEM).

In this role, he prioritized the task of defining terminology and concepts associated with Out-of-Hospital Emergency Care (OHEC) to facilitate standardized research, development, and advocacy. Inconsistent terminology has hindered progress in this field, so in November 2013, Dr. Mould-Millman steered 40 experts in African prehospital emergency care to reach consensus in this subject.

It was agreed that in Africa “tier-one” systems should form the foundation of out-of-hospital emergency care systems. This level of care is relatively inexpensive to implement, and by definition is locally-appropriate and sustainable.

Tier-one systems are composed of first-responders, such as basically trained policemen, taxi drivers, and community bystanders, who offer emergency first aid and possibly emergency transportation if no other options exist.
Where possible, these tier-one responders can activate a “tier-two” response system, which would provide more specialized care, for example, via a formal motorbike ambulance system staffed by trained EMS professionals.

This hierarchy is depicted in the model below.²

Dr. Mould-Millman stresses the value of tier-one development in places without any out-of-hospital emergency care. Engaging, empowering and training community members to strengthen the early yet important links in the emergency care continuum may help save lives in life-threatening emergencies.

Further, a robust community first aid program establishes a foundational network for future integration when second-tier services become developed.

In AFEM’s model, tier-two responders are true conduits between the communities they serve and the medical community.

Tier-two responders receive formal training, for example as emergency medical technicians (EMTs). They have more material resources at their disposal, and operate with more advanced infrastructure. Mould-Millman believes that to implement one tier and not the other in a low-resource African region would lead to a fragmented system.

Advocating for strong two-tiered systems of community and professional responders is novel in African settings. Dr. Mould-Millman calls this approach “The African Chain of Survival” (see below). It is modeled after the American Heart Association Chain of Survival, which was originally designed to improve outcomes for patients in cardiac arrest.

Communication and transportation are necessary operational components to realizing an unbroken African Chain of Survival. The availability and awareness of a toll-free public access number is essential for tier-two emergency systems to be activated.

In Ghana, for instance, there is a 9-1-1 equivalent, which is 1-9-3. The number is widely known among healthcare providers, but lesser known among community members. Emergency medical transportation services in Ghana have similarly limited saturation in the communities. The nationalized ambulance service is commonly used for inter-facility transport.

Only in the most serious circumstances are ambulances used to convey patients from incident scenes to definitive care facilities. In Ghana, like many sub-Saharan countries, there remains a large informal network of emergency medical transportation provided by taxis and personal vehicles.

Unfortunately, bystander care is rarely delivered.³ The AFEM model capitalizes on these gaps and existing assets.

Strengthening the communication and transportation infrastructure around prehospital care must be balanced to assure that EMS services are neither overwhelmed by high call volume, nor left “in the dark” due to lack of efficient communications.

Funding and Future Directions

Researching, coordinating, and implementing an out-of-hospital response system is elaborate and often costly. Mould-Millman is realistic about timing and scale-up.
He emphasizes that important elements of the out-of-hospital care system can be fairly low cost; for example, community trainings, basic first aid kits, cellphone texting programs, and retrofitted bicycles and motorbikes.

Still, there is a debate around whether it is ethical or appropriate to develop prehospital care when facility-based emergency care is underdeveloped in many sub-Saharan African nations.

Dr. Mould-Millman counters that the concurrent development of prehospital and in-hospital care leads to a more fully integrated continuum of care, and therefore better outcomes. Besides, studies have shown that basic prehospital confers a modest survival benefit independent of in-hospital resources.

While global funds for research and development dwindle, sub-Saharan countries must find locally sustainable ways to provide emergency care services.

A fee-for-service structure seen in many developing settings is one approach to bolster shrinking budgets. While patients with emergency conditions are transported free of charge, elective non-emergency transport is associated with a fee. Stop-gap approaches like these allow prehospital development to continue in a limited funding environment.

Mould-Millman believes that situating prehospital care in the broader, and better-funded, global health agenda is another strategy to bring attention to outstanding research priorities.

“...at least three of the United Nation’s Millennium Development Goals can be significantly improved with well-researched and well-developed acute care systems.

Nee-Kofi Mould-Millman, M.D., Assistant Professor of Emergency Medicine at the CU School of Medicine

To learn more about Dr. Mould-Millman and his work; contact him at Nee-Kofi.Mould-Millman@ucdenver.edu

By Molly Terhune

Global Health Symposium
Information coming soon!

How can I submit an abstract so I can share my work at the Symposium?

How can I nominate an individual for the Excellence in Global Health Award?
Mission Brings Surgeries to Some of Guatemala’s Neediest Children

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Once the team arrives, they are met by the Moore Center staff to receive orientation and unpack supplies.

Once orientation is done, the teams receive a list of surgical candidates they will screen the next day, each identified to best fit the surgical specialties of the visiting team.

During the pre-operative screening process the team sees anywhere from 75-100 patients. They identify approximately 60-70 surgical candidates who will receive treatment that week.

Then the anesthesiologists, surgeons and nurses work together to construct a schedule of surgeries for each day.

Surgeries begin on Monday at 7 a.m. The team works from 7 a.m. to 8 p.m., ensuring the final patient has recovered in the PACU before leaving for the evening.

After a quick dinner, team members rest for the next day of surgeries. By Friday, the team is both exhilarated and exhausted.

As one team member, Gregory Allen, M.D., Associate Professor of Pediatric Otolaryngology at the CU School of Medicine and Associate Medical Director of the Cleft Palate Clinic at Children’s Hospital Colorado, put it, “We have been stretched to the limit physically, mentally and spiritually. We have been to the mountain top; we will never be the same.”

The goals of the trips are to increase access to surgical procedures for low income children in Guatemala, to provide high quality and family-centered care for the children and families, and to provide an opportunity for Children’s Hospital Colorado staff to experience the provision of health care in a developing country.

Team members agree the goals are far exceeded. The teams return to Children’s Hospital with a renewed sense of gratitude, commitment and compassion.

To learn more about Children’s Hospital Colorado’s work at the Moore Surgical Center, contact Lauren Heller-Szafran at lauren.heller-szafran@childrenscolorado.org

Gregory Allen, M.D., Associate Professor of Pediatric Otolaryngology at the CU School of Medicine and Associate Director of the Cleft Palate Clinic at Children’s Hospital Colorado

Heidi Childs, a nurse at Children’s Hospital Colorado assists a young patient in the recovery room.

Stig Somme, M.D., Assistant Professor of Surgery at CU School of Medicine and Director of the Surgical Neonatal Intensive Care Unit at Children’s Hospital Colorado (overlooking patient in green mask) and team prepping a patient for surgery.
This international health course is a two week course offered once a year as part of the University of Colorado School of Medicine Global Health Track. The first week of the course is the Global Health section of the course and the second week of the course is the Children in Disasters section.

This course prepares its participants for international experiences and future global health work. This is an interactive training course which incorporates readings, lectures, small group problem based learning exercises, technical skill sessions, online coursework and a disaster simulation exercise.

Learning Objectives for the Two Week Course

Global Health
- Students will learn to diagnose and treat major tropical diseases, including malaria, dengue, typhoid, and intestinal parasites.
- Students will learn about the major public health issues facing communities in the developing world.
- Students will learn about the impact and management of TB, HIV, and chronic disease in the developing world.

Children in Disasters
- Students will understand what makes a disaster.
- Students will recognize the components of disaster response.
- Students will understand the need for disaster preparedness and training.
- Students will learn about the American Academy of Pediatrics (AAP) and Pan American Health Organization (PAHO) Pediatrics in Disaster training program.

Registration

Students, Residents or Fellows

Students, Fellows or Residents currently in a training program. Please note: if you are a student with the University of Colorado School of Medicine or Colorado School of Public Health and you are taking the course for credit, you must register for the course via your school. You do not complete this registration form and payment.

Week 1 - $50  Week 2 - $50  Both Weeks - $100

External Participants

An external participant is anyone who is not currently in a training program as a student, resident or fellow or taking the course for credit with the University of Colorado School of Medicine or Colorado School of Public Health.

Week 1 - $600  Week 2 - $600  Both Weeks - $1,000

Click here to register and learn more about the course!!
An Evening Around the World with CU Students

Robinson Durst Scholarship recipients present their global health work and meet one of the scholarships endowers, Peter Durst at his gallery.

On April 23rd, students, faculty, and community members gathered at the Durst Studio on South Broadway to learn about current global health activities.

The research presented was conducted by students of the University of Colorado who had received the Robinson Durst Scholarship.

The Robinson Durst Scholarship was founded in 1997 by Professor Emeritus William Robinson, M.D., Ph.D., and Denver sculptor/ceramicist Peter Durst.

The scholarship has provided over 50 health sciences graduate students from the University of Colorado with opportunities to enjoy a culturally diverse research experience.

“We’ll have them all make pinch pots!” Peter Durst jokes, gesturing to his table of works-in-progress. He had cleared a large space inside the Durst Studio, Gallery and Sculpture Garden where guests could mingle, snack, and sip wine.

The front of the studio is a gallery that is home to Peter’s completed works, but the rear of the studio is ordered mayhem, as workshops tend to be.

Almost every inch of space has something interesting to look at. Bits of inspiration hang from the ceiling, and unglazed pieces huddle together on shelves lining the walls.

Guests enter in twos and threes, walking through the space, and chatting with colleagues and contacts. Making a last stop at the hors d’oeuvres table, guests find their seats and settle in for the presentations.

Somehow the rain, which is quite heavy on the skylight, enhances the mood. It almost feels like storytelling!

The presentations cover a range of topics from cervical cancer screening to the risks of artisanal gold mining. Sites in Malawi and Tanzania hosted two and three projects respectively, with other projects taking place in Bolivia and Kenya.

We toured through these diverse countries and learned just how widespread the University of Colorado presence really is.

We kicked things off with Heather Hageman’s presentation on breastfeeding practices in the high-mountain city of La Paz, Bolivia.

Hageman, a registered nurse and a recent (December 2013) recipient of a Master of Science at the CU College of Nursing, spent six weeks providing lactation training in the summer of 2013.

Knowing that only 60.7 percent of infants were breastfed during the first hour of life, and only 39.5 percent were exclusively breastfed up to four months of age,

Hageman’s goal was to increase the number of infants who received the benefits of early and exclusive breastfeeding. She did so by implementing the World Health Organization Lactation Counseling Training Course.

She found that the training held traction among nurses immediately following the course, but later follow-up indicated that nurses had fallen into old habits surrounding breastfeeding practices.

Across the Atlantic, in an easterly province of Kenya, third year CU School of Medicine student Abigail Nimz also worked with mothers and infants.

Her research centered on the efficacy of an HIV prophylaxis drug called nevirapine. Nevirapine is given to HIV positive mothers during pregnancy and breastfeeding to prevent transmission of HIV to their children. Abby’s assessment found that 18 months after birth, her overall HIV transmission rate with nevirapine treatment was reduced from 22 to 5.5 percent!

Just south of Kenya, in Mwanza, Tanzania, Levi Bonnell and Denise Hartsock, both M.P.H. candidates (Levi in Epidemiology and Denise in Community and Behavioral Health) at the Colorado School of Public Health, worked under the mentorship of Deborah Thomas, Ph.D., Associate Professor of Geography and Environmental Sciences at the CU Denver College of Liberal Arts and Sciences.

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Denise’s objective was to develop a culturally appropriate first-draft of educational materials for health workers in the artisanal gold mining areas of Tanzania.

Artisanal miners are exposed to high levels of mercury and arsenic, so training materials addressing prevention are especially important.

Levi, on the other hand, used survey data collected in August 2013 to evaluate trends in knowledge, attitudes, and awareness of rabies in Kasulu and Kibondo Districts of Mwanza.

Among other interesting findings, Levi determined that many of those surveyed believed there was a relationship between rabies and malaria.

Elsewhere in Tanzania, Emily Chasco, a Ph.D. student in the department of Health and Behavioral Sciences at the CU Denver College of Liberal Arts and Sciences, used her scholarship funding to do research in the small city of Ifakara.

Emily reported that Tanzanian women under the age of 64 have a cumulative risk of cervical cancer nearly four times that of other women worldwide. Her research asks how perceptions of cervical cancer among Tanzanian women influence their uptake of cervical cancer screening services, and how perceptions affect adoption of cervical cancer screening programs.

So far, her data has shown that there is awareness of the disease, but elements of privacy, stigma, geography, and technology all present barriers to care.

Tanzania shares a terraqueous border with Malawi, mainly comprised by the stunning Lake Malawi. Since 2011 Robbie Flick, a third year CU School of Medicine student, has spent time in Malawi researching tuberculosis.

In his latest stint, enabled in part by the Robinson-Durst Scholarship, Robbie implemented active case finding and created linkage-to-care protocols, designed tools for ongoing evaluation, and assessed baseline TB outcomes.

Driven by the belief that evidence-based medicine should not be restricted to the privileged, Flick maintains that by asking the right questions, research has the capacity to bridge the “implementation gap” and ensure that all communities have access to evidence-based medicine delivered through robust systems. Robbie will return to Malawi in May to continue his research as a Doris Duke Fellow.

Our final presenter shared her research from her home-away-from-home in Zomba, Malawi.

It was 4 a.m. for Kate Dovel, Ph.D. candidate in the department of Health and Behavioral Sciences at the CU Denver College of Liberal Arts and Sciences.

With the aid of Skype (and a little caffeine for Kate) we learned about Provider Initiated Testing and Counseling (PITC) offered to men in Malawi at risk for HIV.

Using the high-risk settings of tuberculosis clinics and sexually transmitted infection (STI) clinics, Kate’s research explores the structural barriers to men’s use of HIV testing, specifically examining HIV policy and provider implementation of testing protocols.

Kate’s early results show that clinics offering only STI services are nearly nine times as likely to offer HIV testing than clients seen in clinics offering several types of care. She found that the main reason given by providers for not offering HIV testing is heavy workloads – providers feel they do not have time to properly talk about HIV and HIV testing. Her research is ongoing.

The evening’s presentations spoke to the breadth and depth of the students’ interest and passion for global health. The content of their presentations was informative, and the nuanced delivery was inspiring.

It is clear that the students’ time abroad has impacted their perspectives on healthcare. Universally, it seems the students’ international experiences impart a certain compassion and commitment that is attained by stepping out of the boundaries of comfortable routine.

The next cycle of Robinson Durst Scholarship recipients was announced in early May, and the students will soon be departing for their summer work. The Center for Global Health wishes these new recipients the best of luck in their research endeavors – we can’t wait to hear about your experience!

To learn more about the Robinson Durst Scholarship and other scholarships administered by the Center for Global Health, [click here].

By Molly Terhune
2014 Scholarship Recipients

Congratulations from the Center for Global Health

Rotary Scholarship
- **Madeline Cole** (School of Medicine - MD) – Responding to community needs: Development, implementation and evaluation of an enhanced WHO iMCi strategy for educating community health workers, Peruvian Amazon
- **Krista Eckhoff** (School of Dental Medicine - DDS) – Establishing a collaboration: School of Dental Medicine, Southwest Guatemala
- **Ian Eisenhauer** (School of Medicine - MD) – Empowering the community: Mapping water sources and sanitation concerns – Southwest Guatemala
- **Stephanie Gold** (School of Medicine Resident in the Department of Family Medicine, Global Health Track) – Bedside teaching and precepting, Chiapas, Mexico
- **Karen Hampanda** (College of Liberal Arts and Sciences - PhD) – Gender, Power and Perinatal HIV, Lusaka, Zambia
- **Paul Kim** (School of Medicine - MD) – A retrospective analysis of causative factors of pediatric malnutrition, Banepa region of Nepal
- **Kimberly Psaltis** (Colorado School of Public Health - MPH) – Malaria Prevention: Designing and planning educational outreach activities, monitoring and evaluation practices, Uganda, Africa
- **Kristin Schmid** (School of Medicine - MD) – Improving survival outcomes through community CPR training programs, San Jose, Costa Rica
- **Haley Smith** (School of Medicine - PA) – Assess stunting in pediatric malnutrition, Dhusi, Nepal
- **Rachel Wojcik** (School of Medicine - MD) – A retrospective analysis of causative factors of pediatric malnutrition, Banepa region of Nepal

Robinson Durst Scholarship
- **Kathryn Dovel** (College of Liberal Arts and Sciences - PhD) – Gender and the provision of HIV testing: Examining how models of care influence men’s use of testing services, Southern Malawi
- **Karen Hampanda** (College of Liberal Arts and Sciences - PhD) – Gender, Power and Perinatal HIV, Urban Zambia
- **Paul Kim** (School of Medicine - MD) – A retrospective analysis of causative factors of pediatric malnutrition, Banepa Region of Nepal

Calvin L Wilson Scholarship for Future Leaders in Global Health
- **Kathryn Dovel** (College of Liberal Arts and Sciences - PhD) – Gender and the provision of HIV testing: Examining how models of care influence men’s use of testing services, Southern Malawi
- **Karen Hampanda** (College of Liberal Arts and Sciences - PhD) – Gender, Power and Perinatal HIV, Urban Zambia

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