WILDERNESS INSTRUCTOR

Wilderness Medicine Within Global Health: A Strategy for Less Risk and More Reward

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In the last several years, healthcare workers and trainees have demonstrated an unprecedented interest in global health and the medical challenges facing developing countries and regions in crisis. Perhaps nowhere is this interest so apparent than in our medical schools and universities, where educators have moved quickly to create programs that meet this enthusiasm. It is now common for medical schools to build relationships with partners overseas and to create formal programs in global health education.¹ The Association of American Medical Colleges (AAMC) documented that 45 US medical schools have some sort of global health component in their curricula, with 29.9% of graduating US medical students stating they have had a “global health experience.”^{2,3} However, these programs vary widely, making it unclear whether schools are meeting a baseline standard of global health knowledge in the types of academic and hands-on opportunities offered to students.^{4(p11)}

Collaborative groups such as the Global Health Education Consortium (GHEC) and the Consortium of Universities for Global Health (CUGH) have made preliminary attempts to standardize global health curricula by identifying core competencies for medical school global health programs. However, few efforts have been made to assess the risks of institutions sending students abroad, or to decide what skill sets are needed as preconditions to go overseas in a medical capacity.

Although there is ample literature on the benefits of short-term international medical training experiences, the dangers associated with sending ill-equipped students to train in resource-poor regions are more difficult to quantify. Little data exist describing accidents occurring among students and trainees working abroad. The US State Department incident database is the most widely cited for injuries

abroad, and consistently reports that injuries and injury-related deaths occur at higher rates abroad than in the United States, especially in low- and middle-income countries.⁵ Other groups that collect travel-related data include the World Health Organization, the Forum on Education Abroad, and the United Educators Insurance Company, yet these databases are limited by underreporting and none stratify for students serving in a foreign country in a healthcare capacity.

Many students are becoming increasingly interested in studying and working in these nontraditional regions; however, they often travel without adequate training to prepare and protect themselves in such unfamiliar places. Many reports describe injuries to medical trainees, often preventable—motor vehicle accidents, noncompliance with medical prophylaxis for endemic diseases, and increased risk-taking behavior.^{6,7} There is a clear consensus among those who have studied both the documented and potential risks to medical trainees working in resource-poor settings that students should be better prepared before they go abroad on clinical electives.⁶ Yet few institutions or groups have described any formal effort to this end. Likewise, there is no consensus to date of published core competencies to guide students or institutions with overseas experiences. Thus, thoughtful educators are left with the conundrum of how best to prepare their students for the physical and mental challenges they may encounter while working abroad.

This article describes a unique medical elective with the goal of teaching senior medical students high-yield clinical skills, self-sufficiency, and an ethical mentality with which to work meaningfully in resource-poor settings. We have drawn on the experience of our institution’s Wilderness Medicine (WM) program for lessons of self-reliance and the delivery of medical care in austere and unpredictable environments and applied it to our Global Health Curriculum. We advocate that such skill sets should be part of any institution’s global health

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program to mitigate risk to participants and their institutions, build confidence, and enhance students' learning experience in the rapidly evolving field of global health.

A Brief Assessment of Global Health Curricula in US Medical Schools

With the field, and even the term *global health*, still quite ambiguous, groups are striving to create some agreement about what global health encompasses. (The 2007 CUGH meeting⁸ describes Global Health as “a field of study, research and practice that places a priority on achieving equity in health for all people. Global Health involves multiple disciplines within and beyond the health sciences, is a synthesis of population-based prevention with individual level of clinical care, promotes interdisciplinary collaboration and emphasizes transnational health issues and determinants.”) GHEC has created a guidebook for US medical schools on global health curricula, with the hope that eventually every medical school will provide at least an “Introduction to Global Health” course to all of its students.⁸ The organization has suggested a set of global health curriculum core competencies that all such programs should include if they intend to “adequately prepare physicians to be active participants in the process of alleviating inequities that form the basis for health disparities.”^{4(p28)} Topics to be discussed may include the following:

- Global Burden of Disease
- Health Implications of Migration
- Travel and Displacement
- Social and Environmental Determinants of Health
- Globalization of Health and Healthcare
- Healthcare in Low-Resource Settings
- Health as a Human Right and Development Resource
- Research, Technology, Epidemiology in Resource-Poor Settings
- Advocacy/Empowerment
- Behavior Change Communication
- Global Health Architecture
- Health Systems

Although each program has its own requirements, all include some combination of lectures, clinical work, a scholarly project, and international field experiences. In creating our global health educational program at Weill Cornell, we looked at our peer institutions' curricula, but it was often unclear how each of these programs personally prepares their students for working overseas. Our own WM program, however, prepares students to improvise and safely adapt to different environments, which we believed was crucial to incorporate into our institution's global health program in some capacity.

Wilderness Medicine at Weill Cornell

In 2005, faculty at Weill Cornell started a Wilderness Medicine program as a “multidisciplinary, university-based program promoting education and research.”⁹ Set in the heart of Manhattan (location of Weill Cornell Medical College), it evolved with a link to disaster response and a strong relationship with its Emergency Medical Services (EMS) Special Operations team. Its rationale was to train members of our healthcare team beyond standard algorithms for large-scale crises. Such an emphasis on functioning in unpredictable circumstances was deemed of great value to the institution, with recent memories of the World Trade Center terrorist attacks and the New York City Blackout of 2003. The program runs 6 weeks of WM student electives semianually, emphasizing comprehension of austere and improvisational care principles through a combination of lectures, workshops, discussions, and scenario-based learning with moulagged victims in the field.

Global Health Education at Weill Cornell

In the fall of 2008, a working group of students and faculty at Weill Cornell began to weave a longitudinal Global Health Curriculum into the 4-year medical school curriculum. The curriculum includes both coursework and hands-on components with three courses over 4 years of medical school:

- Introduction to Global Health: A Case-Based Approach (Year 1)
- Foundations in Global Service (Year 1)
- Global Health Clinical Skills for Resource-Poor Environments (Year 4)

The program also includes a clinical preceptorship with resource-poor or immigrant populations in New York City, a monthly Global Health Grand Rounds lecture series, and two mentored Applied Experiences.

The Global Health Clinical Skills for Resource-Poor Environments course, scheduled in the winter of the fourth year, was designed as a way to prepare senior medical students for a global health experience during their last semester of medical school. The 2-week, 40-hour course teaches high-yield skills in infectious diseases, disaster management, maternal/child health, travel medicine, and orthopedics. We recognized that students' individual global health experiences in their spring semester varied widely as a result of factors such as engagement with preceptors, geographic location, cultural gaps, and differing pathology, which would allow for more-thorough immersion in some areas than in others. Our course was an attempt to fill in these gaps by

providing an overview of pathology and concepts relevant to global health.

A Merger . . .

There has been no report in the literature of an effort to merge WM skill sets into an educational program focused on global health education, and certainly the fields of wilderness medicine and global health are not mutually exclusive. Many practitioners in the field of global health consider WM skill sets an integral part of the work they do, but when comparing the content of the two fields, there are some conspicuous differences. In suggested global health core content, there is little teaching about extreme weather environments, injurious flora and fauna, and skills for personal wellness and survival. Yet those students traveling abroad who were competent and had confidence in creating an effective medical kit, safe water procurement, food and shelter preparation, and other survival skills would certainly be more prepared to adapt to unpredictable environments.

Preparation for the unknown became an essential component of our Global Health Curriculum, best emphasized in the clinical skills course for senior medical students. Part of our assessment of competency was not only a student's understanding of pathophysiology and public health concepts but also self-reliance. Our rationale was simple: Traveling abroad can be stressful and unpredictable, especially the first time. Students who are able to take a proactive role in their own wellness have more energy to embrace the dynamic environment that they are practicing in—making them better learners and caregivers.

Lessons From Humanitarian Response

Such an approach to global health education is needed, especially for responding to humanitarian crises. The tsunami that devastated Southeast Asia (2005) and the earthquakes that hit Pakistan (2007) and Haiti (2010) drew health responders from across the world. There were many media reports from each of these disasters that highlighted that certain healthcare providers, habituated to resource-rich environments, were woefully unprepared to care for their own needs, including shelter, food, and water. These responders were unable to contribute to the relief effort and were a drain on the limited resources available. Even competently trained humanitarian responders in the field face formidable threats to their mental and physical well-being.^{6,10} These experiences have raised the question of which minimum standards should be mandated for US-trained healthcare pro-

viders going abroad, and the responsibility of the institutions that send them.

Organizations have attempted to set guidelines.^{11,12} The Sphere Project in 1997 was a collaborative effort to establish standards—albeit for humanitarian response—which advocated for humanitarian agencies to ensure qualified and competent responders who have undergone training and preparation prior to any emergency situation.¹³ Leaders in the field of humanitarian response now advocate standardization in the training of humanitarian aid workers, and a formal certification program to ensure that all workers have a consistent basic skill set and understand how to be effective in their roles.^{14,15}

Similarly, many nongovernmental organizations have recommended formal training for responders, but few programs exist in medical colleges or residency programs.¹⁶ It is our view that academic global health programs should train students in self-reliance as a precondition for responsible engagement abroad.

Our Global Health Curriculum

We developed our clinical skills elective along traditional norms in global health education. Days were dedicated to maternal and child health, chronic and tropical diseases, and humanitarian response. Yet, part of our mandate was to teach skills that would reinforce self-sufficiency and well-being. From our WM experience, the lecture on infectious diarrhea included a discussion of water filters and field halogenation, reinforcing the important differences between protozoa, viruses, and bacteria in choosing water disinfection methods. We also incorporated traditional WM lectures on pack-loading, and methods to mitigate heat and cold stress. Orienteering using sun, compass, and GPS were also discussed.

We have included an outline of our clinical skills elective, and highlight its WM components. Roughly 15% of our course content overlapped with the WM curriculum (see the Table). Many of the topics' teaching points changed as they were transitioned from the WM curriculum to the global health elective. For example, the topic of medicinal botanicals is less geared to in-the-field identification and more toward understanding the pharmacologic principles of naturopathic medicines that students may encounter in their practice settings.

Conclusions

The growing presence of global health programs in medical schools is changing the scope and practice of medical education in the United States.¹⁷ The growth of WM in the past few decades as an academic discipline reveals a body of knowledge well poised to augment global

Table. Weill Cornell Medical College: clinical skills for resource-poor environments (40 hours)

Wilderness medicine—originated topics (7 hours)

- Safe water procurement—pathogens and field disinfection (1 hour)
- Travel 101 (1 hour)
 - Personal gear and backpack
 - Your medical kit
 - Blister care
 - Orienteering
 - Shelter and fire creation (workshop)
- Principles of medicinal botanicals (0.5 hour)
- Drowning injuries and prevention (0.5 hour)
- Improvisational care workshop (2 hours)
 - Suturing and foreign body removal
 - Splinting
 - Litters and carries
 - Burn care
- Bites and envenomations (1 hour)
 - Dogs
 - Snakes
 - Scorpions
 - Spiders
 - Jellyfish
- Extreme weather (1 hour)
 - Lightning
 - High altitude
 - Hypothermia
 - Hyperthermia
 - Climate change and the impact on the developing world

Traditional global health topics (33 hours)

- Introduction to contemporary challenges in global health (1 hour)
- The global burden of disease (1 hour)
- Global institutions (1 hour)
- Trauma and surgery with practical laboratories (3 hours)
- Ophthalmology (1 hour)
- Orthopedics workshop (2 hours)
- Chronic diseases (4 hours)
- Pediatrics (3 hours)
- Parasites (2 hours)
- Complex humanitarian emergencies (3 hours)
- Torture survivors (1 hour)
- Tropical medicine: malaria, tuberculosis, human immunodeficiency virus (4 hours)
- Obstetrics and gynecology (2 hours)
- Travel medicine (3 hours)
- Future careers in global health (1 hour)
- Ethics in global health (1 hour)

health education. By incorporating its most applicable lessons, medical educators can better prepare their students going abroad. Clearly, data need to be collected to substantiate that such an investment in knowledge and

skills will have a positive impact on global health participants. We should also pool data to better understand the risks for students traveling abroad.

We advocate for such a strategy as a way to mitigate risk and liability as well as to increase the potential of students to contribute as care providers, thereby sitting higher up on the learning curve of global health education.

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