

Global Surgery: Thoughts on an Emerging Surgical Subspecialty for Students and Residents

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Interest is growing in global health among surgical residents and medical students. This article explores the newly developing concept of “global surgery.” Providing surgical care to resource-limited populations, often found in low- and middle-income countries, has numerous professional and personal developmental benefits. A significant interest is found among most general surgical residents; however, it is necessary to formalize more exchange programs and fellowships like some institutions have done. Medical schools also should establish similar global clinical electives to channel the exuberance of students, develop properly their global health interests, and expose them early to the realities and health needs of the global population. Current opportunities for medical students and residents are reviewed along with the relevant literature. (*J Surg* 67:143-148. © 2010 Association of Program Directors in Surgery. Published by Elsevier Inc. All rights reserved.)

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COMPETENCY: Patient Care, Medical Knowledge, Professionalism, Interpersonal and Communication Skills

Outpouring has been strong of medical humanitarian aid from all across the world after the January 12 Haitian earthquake, including more than 550 surgeons who registered to volunteer through Operation Giving Back. This period is an appropriate time for the surgical community to consider the various aspects of global surgery.

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Global surgery often conjures up images of doctors performing crude operations in small hospitals in the jungle or chaotic environments at the front lines of war or disaster. Because growing numbers of medical students and residents are interested in undertaking clinical rotations overseas in low- and middle-income (LMIC) countries, it is important to illustrate what more global surgical rotations more commonly will entail. Such rotations include the opportunity to experience different cultures and to assist in providing medical care for underserved populations. Recent surveys of American^{1,2} and Canadian³ general surgical residents revealed strong levels of interest to partake in international electives during residency and as part of their professional career. We believe that both students and residents from around the globe are intrigued by this prospect. This article explores what global surgery entails, the benefits to one’s personal development, the unique challenges, and various career prospects and opportunities.

DEFINING GLOBAL SURGERY

Global surgery focuses on providing adequate and appropriate surgical care in resource-limited environments located primarily in LMICs. This requires familiarity with general, trauma, pediatric, orthopedic, thoracic, neuro, urologic, plastic, obstetric, and gynecologic surgical procedures as well as knowledge of tropical diseases and the management of complex wounds resulting from wars or disasters.

More broadly, however, global surgery can be viewed as a surgical subspecialty that needs to be formalized—one requiring skills not routinely taught during Western general surgery training. The World Bank Disease Control Priorities Project⁴ and the World Health Organization Global Initiative for Emergency and Essential Surgical Care⁵ have identified improving access to surgical care as a major priority. Both groups advocate for enhanced surgical training and research, an augmented surgical workforce, and improving the cost effectiveness of surgical

interventions. Improving the delivery of surgical and anesthetic care can contribute to achieving the United Nations Millennium Development Goals 4 (child health), 5 (maternal health), 6 (HIV/AIDS prevention), and probably 1 (eradication of poverty).⁶

BENEFITS OF GLOBAL SURGERY

Although the ultimate benefit of surgical programs must be for the patients involved, programs to facilitate international experiences (IEs) for medical students and residents have been found to confer numerous benefits upon the participants.

Personal Development

Medical student or resident IEs in underserved regions can be personally enriching for a participant. For some, the experience represents the fulfillment of a personal dream or the aspiration to help the underserved. Viewed as acts of altruism, these IEs also often can help physicians remember why they initially pursued a career in medicine.² Other reports also document increases in participant self-awareness and the opportunity to gain insight into the human side of medicine.⁷⁻⁹

Professional Education

The educational impact of IEs has been reported,¹⁰ with some authors noting that participants gained improved history and physical examination skills and learned how to practice medicine with limited resources.¹¹⁻¹³ Specific to surgical education, existing literature reveals that IEs provide surgical residents with exposure to procedures not commonly taught in current residency training.^{1,12,14} It is even hypothesized that this knowledge may translate into increased cost-conscious practice back in one's home country.

CHALLENGES OF GLOBAL SURGERY

Technical

Undertaking safe surgery in resource-poor environments often entails numerous challenges that surgeons from high-income countries (HICs) do not routinely encounter. Many times, surgeons must function in facilities that lack basic infrastructure such as water, electricity, and adequate supplies and equipment, and as an extreme example from war-torn Kosovo, Hoxha et al. detailed the use of kitchen utensils as improvised surgical instruments.¹⁵ These examples highlight the value of flexibility in successfully pursuing surgery in LMICs. A unique skill set is required to function as a competent general surgeon in such a rotation and often is deemed to be valuable in the surgeon's overall professional and personal development.¹⁶ One of the more commonly cited benefits is the increased reliance on good history taking and examination skills and cost-minded effective treatment. The University of California, San Francisco (UCSF)

surgical faculty even has mandated a global health experience as a requirement for surgical training.¹⁷

Cultural

Others report an increased appreciation for global health disparities and improved cultural sensitivities,¹⁸ increased cultural awareness and competence,^{11-13,19,20} and a heightened awareness of social determinants of disease and global health.^{7,11-13,20}

Societal

Participating on IEs serves as an impetus for future service endeavors and correlates with establishing practice in underserved populations.^{3,12,21,22} Jacobs et al.¹⁶ suggested that these opportunities can prepare surgeons for practice in rural settings.

OPPORTUNITIES

Currently, the formal opportunities for surgeons wishing to pursue a longterm career in global surgery are limited, and thus, most surgeons participate in limited "surgical blitzes".²³ Often opportunities develop based on personnel contacts or institutional relationships with various hospitals in need of assistance. In 2004, the American College of Surgeons established Operation Giving Back to provide a central resource for surgical volunteer opportunities and disaster response worldwide.²⁴ The website provides one of the best sources of surgical volunteer information; however, the opportunities are limited to those presented by various organizations and not from LMIC hospitals directly.

Educational Opportunities for Global Surgery

Recently, a formal program, the Paul Farmer Global Surgery Fellowship, was established to allow for the study of the role of surgical care in population-based health care in resource-poor settings, both as a student and as an active participant. This 1-year program allows Fellows to choose and focus on 1 of 2 tracks—either clinical practice or research. The clinical practice track is available for those who already have completed a surgical residency. The research track is suitable for either residents or surgeons who wish to take time during their training to conduct more formalized research. The Fellowship leads to the completion of a Master's degree in Public Health (MPH) through a summer program in clinical effectiveness at the Harvard School of Public Health.²⁵

Increasingly, surgical residents are pursuing an MPH during their research years. Such efforts increasingly are being supported by surgical residency program directors. Although an MPH is not mandatory for future humanitarian work, it can be extremely helpful in understanding the complex issues of public health and how they relate to humanitarian assistance. Many MPH programs have a dedicated component for fieldwork, and surgical residents can choose to serve in a facility requiring

surgical assistance and undertake relevant research. Such facilities either can be chosen via individual contacts or through an established partnership with the home institution's surgical program. Recent literature has shed light on the benefits and complexities of setting up such a partnership.²⁶⁻²⁸ Another option is to pursue a more specific degree, such as a Master's of Science in Global Health or Global Health Sciences, offered by institutions such as UCSF, New York University, Oxford University, London School of Hygiene and Tropical Medicine, and Duke Global Health Institute. Shorter courses are also available; the University of British Columbia's Branch of International Surgery offers an online graduate course entitled "Surgical Care in International Health."²⁹ The Center for Global Health at the University of Michigan offers a certificate in global health.³⁰

Formalized International Rotations Within Surgical Residency Programs

Four American institutions' departments of surgery have established structured faculty-supported surgical rotations as part of their residency program, namely Brown,³¹ UCSF,^{32,33} Mount Sinai,^{18,26} and Columbia.³⁴ Their experiences in terms of challenges and successes have been published. The Yale/Stanford Johnson & Johnson Global Health Scholars Program provides opportunities for residents and career physicians in all fields of medicine to rotate to 1 of 6 preselected sites or an approved independent site and focuses on building educational capacity with these partners.³⁵

Apart from the organized programs, ad hoc IEs are increasingly possible. Two published reports of surgical resident IEs include one from the University of Tennessee Medical Center with 1 dedicated year of global surgical experience in Kenya,³⁶ and a second from St. Joseph Mercy Hospital in Ann Arbor, Michigan where a custom-designed 6th year of residency was undertaken in preparation for a full-time missionary/surgeon career in Kenya.²⁷ These are commendable examples of support and flexibility from the respective program directors and surgical faculties in helping their residents achieve unique career aspirations. Surgical faculties in the United States and other HICs should appreciate the numerous professional, personal, and cultural developmental benefits of global surgical rotations and seek to formalize and improve these opportunities for their residents. Fortunately for interested medical students and surgical residents, a national push is underway to formalize and improve these opportunities.³⁷

Opportunities for Medical Students

Several institutions and organizations provide international surgical electives for students. These include the following:

1. Ohio University's College of Osteopathic Medicine (OU-COM) offered its first international surgery rotation in fall 2008—a 2-week clinical immersion in La Ceiba, Honduras.³⁸ A team of 3rd- and 4th-year OU-COM students,

under supervision, visited La Ceiba's Hospital Suizo. During the first week, students assisted with operations for patients wait-listed at the local government hospital. During the second week, students followed up with surgery patients and visited local health-care facilities as well as the medical school in San Pedro Sula.

2. The University of Toronto has an Office of International Surgery³⁹ that facilitates summer electives primarily for University of Toronto medical students. They have links with the Canadian Network for International Surgery, a nonprofit organization that supports an international surgery program started in the autumn of 2004 and has been placing students in various countries ever since.
3. Many European medical schools such as those in the Netherlands and Germany have a long tradition of sending senior medical students for any number of months⁴⁰ to facilities in Africa and rural Australia.⁴¹
4. The Cinterandes Foundation⁴² is a nonprofit organization set up by Ecuador's former Health Minister, Dr. Edgar Rodas. He pioneered a novel concept of mobile surgery by incorporating an operating theater into a 24-foot-long van. Supported by the country's Health Ministry and the medical schools of University of Cuenca and University of Azuay, Cinterandes has brought surgical care to otherwise underserved populations in the Andean mountains, coastal regions, and Amazon jungles of Ecuador. Since 1990, surgeons via the Mobile Surgery Program have performed more than 5000 operations in general, urologic, gynecologic, reconstructive, and ophthalmic surgery.⁴³ All medical students are welcome to spend time with Dr. Rodas and his team for a "tuition fee" of US \$190 per week on various programs within Cuenca, Ecuador. The fee is used to purchase surgical supplies and to support the work of Cinterandes.

These are but a few examples of medical faculties providing valuable opportunities for students to experience international health care, particularly in the field of surgery. Doing so will foster students' interests at an early stage in their career and increase the chances that they will serve in other underserved environments as doctors with specific expertise. The expanding role of global health in undergraduate medical curricula^{44,45} should be matched by a proportionate increase in the number of international opportunities for students. Didactic teaching of global health issues that relate to access to health care and inequalities in health services and outcomes cannot match the real life experiences of an overseas clinical rotation in developing countries. All medical schools should be encouraged to follow suit and establish similar international surgical programs for the benefit and education of their students.

ETHICAL CHALLENGES

In rural and remote areas where health-care providers are a scarce resource, difficult ethical issues may develop if medical

students or residents are expected to perform at a level higher than they have been trained or taught. Various authors have written on this topic, and it is essential that programs and institutions take ethics into consideration when planning or encouraging IEs.^{46,47} It is advisable for students and trainees to plan and account properly for this scenario, ensuring that a qualified surgeon or physician is always available to supervise any treatment attempted to prevent any inappropriate harm to patients. The lack of a medico-legal system in developing countries to hold one accountable should not be viewed as a license to practice outside of one's training. The popular concept of "some help is better than no help" or "some surgery, however expert, is better than none" is erroneous. Raja and Levin⁴⁸ have a valid point of view that the lack of available resources in a society makes a great imperative for getting surgery done right the first time. A higher rate of iatrogenic morbidity and/or mortality will place an unnecessary burden on an already-stressed resource-poor health-care system. However, students or surgical residents still can be immensely helpful if they can provide services at an appropriate level or standard of care.⁴⁹

Another issue commonly raised is the standard of health care rendered in an LMIC versus that of an HIC. Often, resources are limited, particularly with imaging facilities, often deemed crucial in the preoperative phase. In such situations, established surgical algorithms from developed nations like the United States or the United Kingdom always cannot guide treatment strategies. It has been suggested that, in such situations, independent critical thinking and reliance on anecdotal follow-up and local surgeon experience should take precedence and form the basis of a surgeon's decision making.⁵⁰

PREPARATION FOR INTERNATIONAL WORK

Global surgery is not suitable for everyone; however, if one is interested, then it is imperative to attain an understanding of the fundamentals of safe surgical care and patient management. When one encounters difficult or unknown situations concerning the surgical care of patients, then this baseline training will help to provide competent care. Speaking a foreign language and prior formal training in public health and tropical medicine are also valuable assets. Most recently, Médecins Sans Frontières surgeon Kathryn Chu penned an open letter to young surgeons interested in humanitarian surgery and provided a helpful list of 10 suggestions to help prepare for such a career.⁵¹

Students and surgical residents also must keep in mind that while on IEs, they are merely visitors. A proactive and noncomplaining attitude is vital in making the experience better for the host institution. Being open, flexible, non-judgemental, and culturally sensitive can help expedite one's immersion into the local community. Hearing about experiences from previous participants either via informal discussions or formal presentations at Grand Rounds cannot only help future participants mentally prepare but also spark interest in such work.

Students can read widely and be prepared logistically and mentally before embarking on such trips. For example, the Chief Medical Officer of Kolofata District Hospital, Cameroon dispensed some advice from the field⁵²; and several Doctors Without Borders volunteer surgeons have detailed their experiences in LMICs or conflict regions.^{53,54} Physicians such as Jonathan Kaplan^{55,56} and Khassan Baiev^{57,58} have written memoirs about their time providing surgical care in resource-limited settings, and reading these books can provide further insight into humanitarian and war surgery.

CONCLUSIONS

Despite the multifaceted challenges of working in LMICs, especially in surgery, many potential tangible and intangible rewards exist for the student or trainee—satisfaction from benefiting the health care of grateful patients, experiencing another culture, surgical case variety, increased cost-conscious treatment, and developing flexibility, resilience, and adaptability. Medical students and surgical residents interested in such work should evaluate their own personalities and consider the lifestyle sacrifices and time commitment required. Medical schools and residency programs also should support opportunities to develop and facilitate such interests. It is hoped that as a new generation of surgeons develop, surgery no longer will be branded "the neglected stepchild of global public health."⁵⁹

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