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International Surgical Residency Electives: A Collaborative Effort From Trainees to Surgeons Working in Low- and Middle-Income Countries

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Abstract

In today's ever-globalizing climate, the academic sector bears a certain responsibility to incorporate global health opportunities into residency training programs. The worldwide unmet surgical need has been growing; it has been estimated by the World Health Organization that by 2030, surgical diseases will contribute significantly to the burden of global health. International electives (IE) offered during training may partially address this growing need. In addition, it can help trainees develop a heightened awareness of the social determinants of health in resource-limited areas, as well as gain insight into different cultures, health beliefs, and pathologic conditions. General surgery residency programs that offer IE may also stand to benefit by attracting a broader applicant pool, as well as by having the ability to train residents to rely less upon expensive tests and equipment, while further developing residents' physical examination and communications skills. The challenges that IE pose for trainees include the required adaptation to an environment devoid of an advanced and modern medical system, and a difficulty in learning a new language, culture, and local customs. However, IE may also be hazardous for home institutions as they may drain local resources and take limited educational experiences away from local providers. Despite the active promotion of international volunteerism by the American Board of Surgery, few surgery residency programs offer IE as part of the curriculum, with cost and supervision being the major obstacles to overcome. Consequently, it may be difficult to generate American surgical leaders in international health. In this article, we outline the steps needed to bring IE to an institution and how general surgery residency programs can help bridge the gap between surgeons in high-income countries and the growing surgical needs of the international community.

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Keywords

education; international electives; training; residency; global health; global surgery; residency review committee

COMPETENCIES:

Patient Care; Professionalism; Interpersonal and Communication Skills

INTRODUCTION

Global surgery has become a vital component of international health and one that will require more attention from the academic community in the coming years. The fundamental aspect of international electives (IE) involves working in an underserved or resource-constrained population. It can help trainees further develop physical diagnostic skills in a less sophisticated technological setting; gain expertise in addressing global health needs; and help acquire an aptitude in seeing health issues in our own society from a different, deeper, and broader perspective. Surgical residency programs may stand to benefit as well by helping train more efficient, confident, and broadly trained surgeons. In the pursuit of providing an enriching experience for trainees completing an IE, it is also essential to consider the many challenges that it can bring to both the home and host institutions, as well as what approaches can help circumvent these potential hurdles.

Pursuing an IE has often been cited as one of the reasons why medical students choose to become doctors.[1] Although most continue to have an interest in IE throughout medical school, they have a difficult time in securing opportunities. The stress and time constraints of classes and wards may pose a roadblock in pursuing any extracurricular activities, such as traveling overseas to learn clinical medicine.[2] However, a lack of resources, information, and guidance may also prove to be an equally important contributing factor. These barriers do not end in medical school and if trainees are not well versed in finding opportunities and securing the right resources to complete IE while in school, they will continue to face similar challenges in residency training.

The present body of literature shows a disconnect between the international surgical burden of disease and the care received from high-income countries.[3] Groen et al.[4] collected data from households in Sierra Leone and found that nearly 25% of the population reported unmet surgical needs with almost a quarter of them attributing a death in the household the previous year owing to a lack of surgical resources. Surgery is beginning to shed its image as the “stepchild” of global health[5] and the World Health Organization predicts that by 2030 surgical diseases will significantly contribute to the burden of global health.[6] In recent years, there has been increased interest in IE, as well as recognition of IE by the American Board of Surgery (ABS) in 2011. In this article, we outline the steps needed to bring IE to an institution and describe how general surgery residency programs can help bridge the gap between surgeons in developed countries and the surgical needs of the international community.

THE TRAINEE

Medical students and surgical residents are highly motivated in acquiring IE experience. According to a study, 92% of general surgery residents are interested in IE, and 73% would use vacation time to participate.[7] This has changed over time. In 1978, 5.9% of graduating medical students had completed an IE and by 2004 nearly 23% of students completed an IE before starting residency (Association of American Medical Colleges). The destinations that students frequently volunteered in were Mexico, Africa, and the Caribbean. Despite the active promotion of international volunteerism by the ABS, few surgery residency programs offer IE,[8] and even fewer medical schools offer IE as part of the curriculum, because costs and supervision are major obstacles to overcome.

How does one get involved? If an institution does not offer IE then the trainee may need to research and connect with several possible host organizations. The best connections are with organizations that work with a local government to develop sustainable and locally driven efforts in providing health care. Table 1 outlines a list of sources to begin one's search.

Several factors will determine whether a host organization is appropriate to serve as a location for pursuing an IE (Table 2). There should also be an attempt to estimate the surgical burden in the community, to determine the most frequently presenting illnesses, to identify the level of training of the staff at the host institution, and to ascertain their experience in teaching. The decision to include an attending surgeon from the home institution to accompany the trainee should be discussed with the staff at the host institution. In addition, without being too assertive, trainees should also inquire about the role that they would play on the team. It is important for the trainee to clearly outline their goals, as well as to understand their limitations so that all parties can maximize the experience.

Once a trainee has found a suitable host, the next step will be to draft a well-researched proposal and present a plan to the mentor or program director. The trainee must carefully choose a mentor who has experience in international medicine. It is important to note that many students or residents pursuing an IE may come across some early resistance. In this case, being persistent and networking with influential people in the surgical department can help to garner support. Once people recognize the determination and passion of the trainee, they are more likely to offer assistance. The proposal should include information about the host institution, goals for the trip, the duration, and the role the trainee will serve while volunteering. It is important to provide as much detail as possible understanding that this undertaking may function as the catalyst for a longitudinal initiative between the surgical department and the host institution. Thus, it may not only serve as a vehicle for providing clinical experience, but also a link for collaborative efforts in outcomes-based research.

The ideal time to pursue an IE is during the latter half of training—the third and fourth years of medical school or residency training when trainees will have more of a foundation to build upon during the IE. Students that choose to work abroad before this will be at a disadvantage because of their limited clinical aptitude. However, in pursuing an IE, trainees should start early as it may take up to a year to finalize preparations for the trip. The trip should be at least 2 weeks long, but optimally it is 4 or more weeks to truly maximize the

experience. This is supported by the fact that most IE offered during medical school and the various funding opportunities available to students require at least a 1-monthlong commitment from the trainee.[9] Fourth-year medical students that have traveled abroad for an extended period of time have reported feeling that they benefited more fully during their international elective and contributed more while on site. Funding and time constraints are certainly issues that trainees must take into consideration.[9] However, do realize that host institutions may invest heavily with respect to resources and community time to make trainees feel welcomed. If the trips are too short, a large expenditure of the host institutions' resources may bring them limited return. This may negatively affect their decision to participate in the training of future students or residents.[9]

Many places are in need of medical supplies and equipment. Medical supplies should not be brought without asking the host institution. They will frequently have information on what is most desired or they may decline all offerings. A variety of resources (Table 3) are available to help with this part of the trip. Alternatively, reaching out to the chief executive officer or dean of the home institution's health system may also help to secure donations. In acquiring medical supplies, it is important to note that expiring antibiotics has become a sensitive issue, with most countries not accepting these donations.

Before embarking on the trip, it is essential to understand the political situation and history of the destination. This will help the trainee appreciate the host's health care system, and the factors that influence health care decisions. Talking with past volunteers is the best way to ensure a safe and productive trip. Consult the Centers for Disease Control and Prevention website (www.cdc.gov/travel), as well as your local travel clinic for appropriate vaccinations and medications to take. In the week before the trip, the trainee should pack conservatively and only take items they would not mind losing. No matter how much one prepares, there are always surprises and knowing how to adapt to new situations is an important attribute to have.

Medical students that have participated in IE report greater ability to recognize disease presentations, better physical examination skills, less reliance on expensive imaging/tests, and a greater cultural sensitivity.[10] Surgical residents can learn to work in novel environments, allowing them to learn innovative and different skills/techniques in a setting of limited resources. In the technologically driven world of surgery and the emphasis on the minimally invasive approaches, IE can serve as a vehicle for providing care for disorders diagnosed without high technology examinations and may help trainees become better prepared in handling failed minimally invasive cases that require open surgery. Although "imageless" exploratory laparotomies are often performed in low and middle-income countries, most American residents are not used to performing truly exploratory laparotomies. Meanwhile, IE may be the only time that a trainee will observe the ill effects of untreated tuberculosis or typhoid. In addition, the success of surgery relies more heavily on the communication skills of the resident with persons of varying cultures in lieu of technology-dependent procedures that may not be available or is not cost effective. And lastly, completing an IE may help residents become more resource efficient. A preliminary study concluded that residents generate an average of $122 less in orders per patient per month after completing their IE. However, this particular study had a small sample size and

could not conclude a causal relationship.[11] Whether the trainee plans on incorporating global health as part of their future practice or if this IE will be the only attempt at serving internationally, this experience will be sure to make a lasting impression on their career.

THE MENTORS AND PROGRAM DIRECTORS

Mentors play an essential role in a trainee's career and can be instrumental in helping secure IE opportunities for their mentees. The mentor serves as an advisor and provides motivation, emotional support, and role modeling. They also help the mentee explore career opportunities, set goals, develop contacts, and identify resources. The greatest benefit is often gained by the mentee, not the mentor.[12] Surgical trainees have had an increased interest in traveling internationally to secure clinical experience.[7] Parallel with this increase arises the need for improved mentorship to maximize the effectiveness of IE and to ensure continued guidance as trainees graduate and enter independent careers.

The role of the general surgery residency program director is to provide an organized educational program with guidance and supervision of the resident. This should facilitate their personal and professional development while ensuring safe and appropriate care for patients. Across most general surgery residency programs, there has been a recent trend in going lower in the rank list to fill categorical positions.[13] This may be related to a disconnect between what programs offer residents and what aspiring surgeons are looking for. A large proportion (89%) of residents are interested in incorporating international surgery into their future careers and operating was the most commonly listed aspect of interest.[14] Increasing the number of IE in general surgery residencies may help to attract the best and brightest medical students to this field, which has tended to enticefewer and fewer applicants throughout the country in recent years.[15,16]

THE LOCAL SURGICAL TEAMS

Many people may stand to benefit from IE. The local population at the host institution may be in need of additional man power from health care providers. Other countries have qualified surgeons that may benefit from a partnership aimed at helping support outcomes measurements. However, some may argue that IE perpetuate a simplified view of global surgery and further the flawed notion that an abundant, younger, and even underskilled work force is the way out of the development conundrum.[17] When constructing IE, care must be taken to avoid negative consequences to the local surgical teams. In addition, it is important to screen out disingenuous volunteers that may have a hidden agenda for the trip, such as those who display a predominantly vacation mindset.[18]

THE CHALLENGES

There are also challenges for both the trainees and host institutions to be aware of when starting an international elective. The current generation of future doctors is unfazed by sophisticated medical equipment, electronic medical records, and supportive ancillary staff. However, these are oftentimes unavailable or nonexistent at host institutions. Thus, trainees will need to adapt to a workflow that they may not be accustomed to. This unperturbed

notion toward modern health care delivery may be fueled by the ignorance of the perceived costs of medical devices and systems. According to a survey of 503 physicians, attending physicians correctly estimated the cost of a particular orthopedic device only 21% of the time, and residents did so 17% of the time.[19] Trainees may also find it difficult to learn a new language and culture, to eat different foods that may be detrimental to certain dietary restrictions, and to adjust to both local weather and political climates. Ironically, much of the same qualities that we find admirable in persons that chose to pursue a surgical career such as decisiveness, persistence, ability to take charge, and an aggressive personality are detrimental in the resource-drained environments of IE. Trainees must also appreciate the delicate balance of joining a host institution's surgical team, while trying to not encroach upon the local provider's turf because they may be deferential or even initially resistant to outside aid. It is also important to be aware of the drain in resources that IE may impose on the host population. Local trainees depend on the OR time with staff surgeons and often have limited exposure to teaching and equipment. Extreme caution must be exercised to not take opportunities away from local trainees but rather to defer to local practice patterns, which may not always align with practices found in high-income countries. Instead, these may be more appropriate within the particular resource constraints and culture of the host environment. Provision of care can instill dependency when it need not exist and this should be avoided. Without attention and value to the skills and expertise of local physicians, IE may unintentionally perpetuate feelings of inferiority, inadequacy, and humiliation among local providers. The goal of an IE must be to learn while maximizing the benefit gained by the host institution, its providers, and patients.

THE EMERGENCE OF FORMALITY

A cross-sectional study of 253 general surgery program directors showed an overwhelming interest in instituting formal IE to their programs but the need for standardization exists.[20] In 2011, the General Surgery Residency Review Committee and the ABS approved IE for credit toward residency graduation requirements. How can a program director bring formal IE to their program? The Residency Review Committee has issued a set of requirements for the installment of IE in the curriculum (Table 4). In addition to the formal regulations governing the introduction of IE at an institution, there are also practicalities that need to be addressed. There must be a system in place to properly orient trainees to the local language, culture, and medical environment, preferably before arriving at the host institution. Furthermore, there must be time partitioned for postvisit debriefing, including review of the learning objectives. Measuring outcomes is entirely necessary as it provides objective data about the effect that the IE has on the host institution. This is imperative as it can help avoid any ill effects that IE may have on the host institution or its patients.

BUILDING AN INTERNATIONAL ELECTIVE

The general surgery programs at the University of California, San Francisco and Icahn School of Medicine at Mount Sinai have reported their experience in IE and have proposed a guide to help jumpstart an IE.[21,22] The best way to scout a location is with a small committee of attending physicians and residents to help establish initial contacts (Table 1). Reaching out to the host institution and stating the goals of the venture is entirely

acceptable, especially if there is a prior relation. But the request for partnership and the terms of that partnership must come from the host institution. This will ensure a sustainable IE. Safety is of utmost importance when choosing a location and special consideration should be paid to the crime rate and sociopolitical instability. Case volume and distribution is also an important consideration when choosing a location and should coincide with what the potential residents are trained in performing. It is also desirable to choose locations where local providers do not routinely perform the services that will be provided by the trainees. Funding is often a potential roadblock, but there must never be a financial burden imposed on the host institution. The issue of supervision and mentorship is supreme and is often the rate-limiting step in bringing IE to the curriculum. If a local physician provides the supervision, there must be an attempt to ensure that the training received by residents is maximally beneficial. If the supervision is supplemented by local providers but largely carried out by a US surgeon that will not be accompanying the trainee on the IE, there must be a system in place to facilitate open dialog and to ensure adequate emotional processing is occurring. All visiting parties should be careful to not offer unsolicited advice or attempt to change practice patterns. Visitors rarely have the answers and if there were a “quick fix,” it is likely that it would have already been done.

Although this is a learning experience, excellent patient care should remain paramount in all health delivery opportunities. Some may argue that the patient needs are greater in developing countries and justify the delivery of care by unsupervised learners. However, this can not only hurt the population served but also instill ill-advised techniques and management of surgical complications in impressionable trainees. Having dedicated supervision should be considered essential when establishing an IE. It is conceivable and at times more appropriate for host institutions to provide mentors for trainees but this should be discussed beforehand and there should be a clear understanding of the skill level of the trainee in the American system. For example, American interns may not be properly trained to perform procedures traditionally done by the interns of the host institution, such as an appendectomy. Optimally, there would be a long-standing relationship between both the institutions so that it is clear who is supervising. There are also alternatives that are worth exploring. Yale has experimented with sending chief residents committed on global health tracks to serve as attending physicians on trips to Uganda and have shown promising results.[23] IE should not be made a mandatory requirement in the curriculum but should be widely available and highly encouraged.

THE SURGEON OVERSEAS

Perhaps the best way to ensure proper supervision is to have a faculty member permanently stationed at the host institution or have long-term positions filled by a small pool of attending surgeons. For example, a Vanderbilt faculty pediatric surgeon lives in Kijabe, Kenya full time and routinely trains residents.[24] However, the existing population of surgeons that have chosen to dedicate their careers to global surgical care are rarely in academic positions and are not routinely exposed to trainees.[25] Short-term positions on “relieftrips” impose a discontinuity in the mentor-trainee model that is perhaps more important to surgery than in any other branch of medicine. However, inappropriately short trips may be challenging in multiple regards. The high volume of patients and cases may

encroach on meaningful teaching time, and the acclimatization of trainees, while learning a new health care system and disease processes, may consume a great deal of time.

Having a surgeon stationed at the host institution can serve many roles. Perhaps the most important role is that of a promoter to transform the host institution into a training program for local physicians. This not only strengthens the relationship between the home-host institutions but also can ensure long-term sustainability of its clinical services to the local population. Axt et al. reported that the differing health care systems of the United States and of Kenya can present difficulties to visiting physicians, and these can be remedied by having awareness of the local customs and traditions of the host population. In the United States, the decision for managing complications of surgical procedures is often found in textbooks, whereas the correct approach in Kenya relies on the financial burden on the patient or their families.[24]

What are the qualities of a surgeon who should take on the role of mentoring residents overseas on a long-term basis? Huang and Rhodes[26] discuss what qualities they saw most fitting for this role. The surgeon does not necessarily have to be a faculty member from the home institution but he/she should be intimately familiar with the residency training process and knowledgeable about the skill level of residents at different levels of training. The surgeon should have a rapport with the local population and take pride in serving as the liaison between the community and visiting trainees. Perhaps the most important quality is to have the willingness and ability to effectively teach residents in resource-limited settings. Another important attribute is language acquisition. Although charting, and such, may be written in English, the patients may not be able to speak English. And lastly, the technical skills taught in the operating room may not be the most important teaching opportunity. DeGennaro et al.[27] describe that over their 9 years of operating in Haiti, the most important aspect of successful surgical missions is what happens before and after the patient enters the operating theater. Without the knowledge of local customs, traditions, and cultural considerations, even the most experienced teams will have higher rates of unfavorable outcomes.

CONCLUSION

Global surgery can be thought of as a surgical subspecialty and one that does not receive enough attention in US general surgery residency programs.[28] This article describes methods to support the growth of the next generation of surgical leaders in global health.

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TABLE 1.

Resources to Find Mission Trips

Operations giving back	The American College of Surgeons has recently started a division to serve as a comprehensive resource center where volunteers can find opportunities to participate with both national and international surgical teams on short- and long-term mission trips. http://www.operationgivingback.facs.org/
International medical relief (IMR)	IMR provides medical, dental, and surgical care to underserved populations throughout the world through mission trips. http://www.internationalmedicalrelief.org/
Mission finder	An excellent resource that lists mission trips from all over the world. You can search trips based on type, duration, location, skill level, and funding. http://www.missionfinder.org/
Direct approach/personal contact	Using the resources available at your institution can prove to be the most effective and reliable method in making initial contact with a host organization. Networking within your department can often yield contacts involved in various mission trips.

TABLE 2.

Desirable Host Organization Attributes

Desirable Attributes
High surgical burden
Available mentorship
Dedicated operating room
Language interpreter available
Committed staff of trained health care workers
Experience working with international groups
Ability to provide safe housing, meals, and drinking water
Supply of medicines and equipment

TABLE 3.

Resources to Help Secure Donated Medical Supplies

Advocates for world health	Nonprofit that recovers and redistributes medical product. It is a student-led initiative where college students actively participate in collecting medical supplies. http://www.awhealth.org/
Direct relief	Through generous contributions from individuals, pharmaceutical companies, and medical equipment manufacturers, Direct Relief has equipped health care professionals and organizations with essential medical supplies. http://www.directrelief.org/
MedShare	MedShare is a nonprofit organization dedicated to improving health care and the environment through the efficient recovery and redistribution of the surplus of medical supplies and equipment to those who need it most. http://www.medshare.org/
AFYA (Swahili for good health)	AFYA supports ongoing health initiates in Africa and the Caribbean by collecting medical supplies and equipment from corporate and private communities. http://www.afyaafyafoundation.org/
Local support	An important but untapped resource is often the home institution. Networking within your department may help connect you with the right people to help supply you with discarded medical equipment

Table 4.

Residency Review Committee International Elective Application Guidelines

PGY Level 3 or 4
Duration of rotation
Submitted to WebADS
Supervision from member certified by the American Board of Surgery
Home institution must be accredited on 4-year cycles
Statement detailing the goals and objectives of the IE
Statement detailing the rationale behind the IE and what educational experience it can serve that the primary institution does not
Statement regarding how the resident will be evaluated
Description of the clinical experience
Type of center (government, private, etc.)
Scope of practice available at the host institution
Host institutions case load and type
Statement describing the role of anesthetic, radiologic, laboratory, and critical care infrastructure
Verification of an outpatient component
Verification that the resident will enter operative experience for credit
Verification that salary, travel expenses, health insurance, and evacuation provided by sponsoring institution
Description of educational resources available at host institution
Statement addressing physical environmental issues including housing, transportation, communication, safety, and language

Source: http://www.acgme.org/acgmeweb/Portals/0/PFAssets/ProgramResources/160_International_Rotation_Application_Process.pdf