Annals of Global Health VOL. 82, NO. 4, 2016

ISSN 2214-9996/$36.00
http://dx.doi.org/10.1016/j.aogh.2016.09.006

STATE-OF-THE-ART REVIEW

Improved Techniques and Future Advances in Plastic Surgery in Global Health

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Abstract

BACKGROUND Plastic surgery has a long-standing history of being deeply interconnected with global health. This paper reviews the current state of global health as it relates to plastic surgery and makes forecasts for the future.

METHODS This study reviews the most current literature on global plastic surgery, as well as offers insights based on our 2 senior authors' experiences. For our literature search, the MEDLINE database was queried using relevant keywords through both PubMed and OVID user interfaces.

FINDINGS Early exposure to global plastic surgery often leads to a lifelong involvement. Formal integration of global surgery into residencies is becoming more common. Models of care for global plastic surgery range from small to large groups, spanning the full spectrum of reconstructive plastic surgery. The best of these groups have longitudinal relationships with their operative sites to allow for continuous care. Logistics and funding are crucial for successful care. Technological advances will make long-distance care more facile in the future.

CONCLUSIONS Global plastic surgery is rewarding to both patient and physician. Plastic surgery has been and will continue to be committed to providing high-quality global health care.

KEY WORDS plastic surgery, global health, global surgery, medical missions

INTRODUCTION

> "Service to society is the rent we pay for living on this planet."
>
> — Dr. Joseph Murray

Plastic surgery has been involved with global health for many decades and is perhaps its oldest and most notable partner. However, only recently has the medical community as a whole recognized how important surgical care is to global health. In 2008 it was estimated that 11% of the total global burden of disease could be treated with surgery.[1] In light of the estimate that more than 2 billion people lack access to adequate surgical care,[2] international efforts have been made to improve global access to safe and effective surgical care, including the creation of The Lancet Commission on Global Surgery.[3]

Plastic surgery leadership has identified the moral imperative to continue to grow and improve global efforts in light of the tremendous need for global care. The following reviews the current state of global health as it relates to plastic surgery—both how trainees are recruited and how mission work functions—and to make forecasts for the future.

Conflicts of Interest: None of the authors have any conflicts of interest to disclose. All authors had access to the data and a role in writing the manuscript.
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EDUCATION

> "Start early to instill in your students awareness that they are on this earth to help and serve others; that is as important to pass on to them as knowledge."
>
> — Dr. Albert Schweitzer

Historically, cultivating interest in global plastic surgery has been an informal and varied process. Some surgeons are exposed as early as medical school in either an academic medical center or in conjunction with a community practitioner. The opportunities range from patient assistance to hands-on surgical care to mission organization and leadership. In some plastic surgery training programs, the residents at senior levels have the opportunity to travel with attending surgeons who participate in this type of work. Some then develop a lifelong interest in global health care and continue it when they go into practice. More recently, medical centers have developed institution-wide initiatives to provide recurring exposure and ongoing support to 1 or more areas in need.

In 2008 a survey was sent to residents who had participated in the first Operation Smile Regan Fellowship a year earlier. Not only did the residents report that the experience had positive impact on their personal growth, but the experience was also found to foster each of the core competencies described by the Accreditation Council for Graduate Medical Education.[3] In 2011 a separate survey was sent to 45 residents who had participated in cleft lip/palate missions during their residencies. Of the 39 respondents, an overwhelming majority (86.7%) believed their experiences abroad improved their surgical skill and made them more culturally and socially aware. Almost all respondents, 94.9% (n = 37), planned on participating on medical missions after residency.[4]

Acknowledging the positive impact global health experiences have on plastic surgery residents and their training, a group from the University of Wisconsin sent electronic surveys to all accredited plastic surgery residency programs in the United States in 2013 to better understand the current state of global health education within plastic surgery residency. Twenty-six programs (40.6%) reported that global health was a formal part of their education. Only 12% (n = 3) of these programs have formal accreditation by their Residency Review Committee for their global health components. For the 59.4% (n = 38) of programs without a global health component, lack of accreditation, lack of funding, and lack of salary support were listed as the most common reasons for not having it.[5] Because accreditation is an important component of promoting global health curricula, both the aforementioned paper and another from Hershey Medical Center [6] provide guidance as to how plastic surgery residencies can receive accreditation for global health education.

Recently, plastic surgery has reaffirmed the importance of global health training in residency on the national level. In 2014 the American Council of Academic Plastic Surgeons made integration of global health training into residency the focus of their spring retreat in Miami, Florida.[7] The group from Wisconsin wrote that, "Given the paucity of published data regarding the effect of global health curricula on surgical education, research into the outcomes of international surgical experiences was made a priority agenda moving forward. Perhaps most important was the symbolism of the meeting, as it represented the first organized forum where individual plastic surgery residency programs gathered to exchange their attitudes and experiences with global health training."[5]

Although formal global health curricula in residency are gaining momentum, formal fellowships in global plastic surgery are still few in number. Already mentioned is the Regan Fellowship offered by Operation Smile to current plastic surgery residents. This includes a 2-week clinical rotation in different sites around the world.[3] Operation Smile also offers a yearlong clinical fellowship in global plastic surgery after residency that is currently funded by the Hearst Foundation.[8] The Paul Farmer Global Surgery Fellowship is an unfunded fellowship through the department of plastic and oral surgery at Boston Children's Hospital that offers research tracks for medical students and residents and a clinical track for board-certified surgeons.[9] With the limited number of these formal fellowships, one resident writes of his experience in carving out his own academic year in a general hospital in rural Kenya.[10]

However, it is an important caveat that with global plastic surgery, resident education is still only a secondary goal—the primary being safe and effective patient care. Dr. Christian Dupuis warned in 2004 that the "poor of the Third World are not experimental fodder," recommending against giving residents any more autonomy than that which they would be given at home. It is hoped that almost all mission trips connected to academic centers in some way adhere to this philosophy. There will always be a need for senior surgeons to mentor residents on

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surgical mission trips. American Society of Plastic Surgeons have guidelines for mission activities that incorporate this philosophy.

MODELS OF CARE

> "A physician is obligated to consider more than a diseased organ, more even than the whole man—he must view the man in his world."
>
> — Dr. Harvey Cushing

The models of care for global plastic surgery range from the very large well-known organizations with ongoing care in multiple countries overseas to smaller individual groups with contacts abroad with whom they work and assist. A few of the better-known entities include Operation Smile, Smile Train, and ReSurge International (formerly Interplast). Smaller groups include KomedyPlast[11] and those supported by church groups or individual residency programs, such as the University of Miami. Regardless of size, the basic aim of these groups is to meet the surgical needs of the site at which they work. Plastic surgery global health initiatives span the whole spectrum of reconstructive surgery, from craniofacial/cleft surgery to burn reconstruction to hand surgery.[12-15]

The best programs are those that develop longitudinal relationships with the local community. No longer is it sufficient for mission groups to perform a large number of surgeries and leave without ensuring follow-up care. Now the new standard for missions includes teaching and training onsite staff so that the work can be carried out continuously.

Operation Smile compared the cost of their medical mission cleft surgeries in India to those at a local comprehensive care center for cleft lip and palate. They found that local care center provided significantly higher cost-effective care than the medical missions, although both were still considered cost effective according to World Health Organization guidelines.[13] It also makes little sense to introduce technology and techniques with which the local surgeons cannot afford carry on.

Smile Train reports supporting more than 1 million cleft surgeries in 85 countries.[16] They recently published a study evaluating the impact of their partnership hospital model on 12 local hospitals. They found that after pairing with hospitals, follow-up rates improved significantly, the hospitals formed more interdisciplinary cleft teams, and the total number of surgeries increased; however, there was no change in 30-day reoperations or readmissions.[12]

Patient safety and health should be paramount for any global health initiative. Different plastic surgery groups have published guidelines and standards that they recommend employing during mission work. Operation Smile uses World Health Organization and their own safety checklists. The few examples from these checklists include assessing volunteer's credentials, setting surgery-specific exclusion criteria for patients, and strict requirements for surgical and anesthesia equipment.[17] Ethical guidelines exist as well.[18]

LOGISTICS

> "You will not find it difficult to prove that battles, campaigns, and even wars have been won or lost primarily because of logistics."
>
> — General Dwight D. Eisenhower

The level of logistical complexity of medical missions can vary. There will always be a primary need for site approval from the national or local governments as well as the local health care community before a mission. For missions that perform surgeries in sites lacking the basic operative resources (eg, equipment, operating rooms, nursing staff, etc), the logistics will be immense. For certain trips, there may be a need for intensive care or a functioning blood bank. There are papers that comprehensively outline site selection, equipment demands, and personnel demands.[17,19,20] Depending on the country in which a mission takes place, differing levels of support will be required from the local and national government. All of this must be considered before proceeding.

FUNDING

> "The lack of money is the root of all evil."
>
> — Mark Twain

Last, but certainly not least, is funding. Large, established organizations with international experience, such as Smile Train and Operation Smile, do their own fundraising and are able to support their own projects. Global health care projects may also be supported through outside organizations, such as the Hearst Foundations.[8] In many instances

(more often with small- to medium-sized groups), the airfare and travel expenses are paid for by the participants (surgeons, nurses, and assistants) involved with the mission. In some instances, local hospitality may provide housing, meals, and so on. For those missions that require supplies and equipment, companies may provide these through donation programs that support global mission work. This may include surgical instruments or plates, screws, sutures, and more.

FORECASTS FOR THE FUTURE

> "It's the best time ever to be a doctor because you can heal and treat conditions that were untreatable even a few years ago."
>
> — Dr. Joseph Murray

The future of plastic surgery on the global health stage will certainly revolve around advances in technology. In the past, complex problems requiring major reconstructions required face-to-face evaluation of the patient by the physician. This was difficult if the 2 were separated by space and time. The surgeon might be skeptical about traveling a large distance only to realize the problem was too challenging to attempt. Furthermore, surgeons were hesitant to perform exceedingly complex surgeries on patients when they would have little or no chance for close follow-up. Complications cannot simply be left to the host physicians.

Today, technology can afford physicians almost instantaneous transmission of digital data, as well as virtual consultation. Host physicians in less-advanced countries have greater skill than they did in the past. More surgeons have been given the opportunity to train across the globe through scholarships and access to various modalities of learning has multiplied. This has made complex surgery in remote areas of the globe more facile and hopefully safer. Surgeons can inexpensively consult on patients half a world away, travel more easily, and have more complete follow-up with the ultimate goal of delivering safer health care.

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