



## ORIGINAL ARTICLE

# Head and neck surgery global outreach: Ethics, planning, and impact

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## Abstract

**Background:** Head and neck surgical oncology and reconstruction are uniquely suited to address burdens of disease in underserved areas. Since these efforts are not well known in our specialty, we sought to understand global outreach throughout our society of surgeons.

**Methods:** Survey distributed to members of the American Head and Neck Surgery involved in international humanitarian head and neck surgical outreach trips.

**Results:** Thirty surgeons reported an average of seven trips to over 70 destinations. Identification of candidates, finances, on-site patient care, complications, long-term post-surgical care, ethics, and educational goals are reported. We report a success rate of 90% on 125 free flaps performed in these settings.

**Conclusions:** The effort to answer the call for alleviating the global burden of surgical disease is strong within our specialty. There is a shared focus on humanitarian effort and teaching. Ethics of high resource surgeries such as free flap reconstruction remains controversial.

## KEYWORDS

free flaps, mission, outreach, surgery abroad, surgical mission

## 1 | INTRODUCTION

Great disparities in health care exist in underserved and developing countries around the world and are well known.<sup>1</sup> The current impact of surgical outreach has

Ehab Y. Hanna, MD, Editor, was recused from consideration of this manuscript.

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been reprimanded by the Lancet Commission on Global Surgery. The Commission reports that the untreated surgical conditions are large and that there is a lack of focus and resources devoted to treatable diseases.<sup>2</sup> Of the 10 needs outlined by the Commission, the greatest is the need to train surgical providers.<sup>2</sup> Given the world burden of head and neck disease,<sup>3</sup> head and neck surgeons are well suited to directly participate in achieving the goals of an international call for improving surgical care around the world.

Resource allocation and the utilization of free flap surgery in humanitarian settings has been reported by groups describing their individual experiences without a consensus of how multiple groups view their outreach, decisions, and outcomes.<sup>4-8</sup> We set out to better understand the preparation, surgical, and ethical considerations of US-based head and neck surgeons who have established programs of service and teaching in low-resource nations. By collating this collective experience, we aim to articulate safe practices and provide a framework for future program development. To understand the decision making surround the complexity of cases undertaken on these trips, we compared two groups of humanitarian surgical trips: those who opt to use free tissue transfer when necessary and those who choose to perform only ablative surgery with local reconstruction when necessary.

## 2 | MATERIALS AND METHODS

Institutional Review Board (IRB) approval was obtained to survey surgeons through a digital survey platform (SurveyMonkey, San Mateo, CA). The concept and survey were constructed by the authors with approval and recommendation from the American Head and Neck Surgery (AHNS) Global Outreach Committee.

Humanitarian outreach programs that were in correspondence with the AHNS Global Outreach Committee were initially approached to participate in this survey. These surgeons were then asked to identify other otolaryngology surgical outreach teams, from which we identified and contacted 39 head and neck surgeons. Survey respondents were de-identified before data analysis. The collective group of surgeons was divided into two groups: those who perform free flap reconstruction and those who perform only ablative surgery in cases that do not require free flap reconstruction. The survey was constructed to focus on four components: (1) trip planning, execution and post-trip follow-up, (2) operative management, (3) training of local surgeons, and (4) ethical considerations.

## 3 | RESULTS

The survey was distributed to a total of 39 surgeons who perform head and neck surgery in developing nations. The Global Outreach Committee identified 23 surgeons who performed ablative procedures without free flap reconstruction, while the remaining 16 surgeons performed ablative and free flap surgery. Eighty-eight percent (14/16) of those that perform free flap surgery responded to the survey, and 70% (16/23) of the ablative group responded to the survey.

The combined group of responders reported participation in an average of seven surgical outreach trips each (range 1–25) with destinations including Africa (37 locations), Central America, South America, and the Caribbean (19 locations), as well as Asia (16 locations). Many reported multiple trips to the same location (most commonly 1–2 per year), with many intent on building long-term partnerships with host hospitals.

### 3.1 | Identifying surgical candidates

Identification of appropriate candidates for surgery can be completed either in advance with the assistance of local practitioners or on-site during the trip itself (walk-in clinics). In the ablative group, pre-trip patient screening took place 33% of the time compared to 77% in the free flap group. In the case of the ablative group, 40% attributed this approach to a lack of qualified individuals at the host site to appropriately screen surgical candidates prior to arrival. In the group performing free flaps, 85% of respondents communicate with local otolaryngologists and/or general surgeons to identify potential patients ahead of time. Of these, 84% reported strong confidence in local teams to complete adequate preoperative workups.

### 3.2 | Financing head and neck surgical outreach trips

There are several considerations when financing head and neck surgical outreach trips, including equipment/supplies, costs of care, and costs to visiting participants. Regarding surgical equipment, 73% of respondents in the ablative group use host hospital equipment and supplies, while 85% of respondents in the free flap group bring their own supplies with them. This group often acquires these through donations from medical supply and device companies.

Many host hospitals charge fees to the visiting teams for patient care, particularly in the setting of free flap cases. Ninety-one percent of the free flap group respondents reported payment to host hospitals for patient care, either on a per-patient (55%, range \$100 to \$800 per case) or per-trip (36%) basis, whereas 73% of the ablative group reported not rendering payments to host hospitals. Seventy percent of respondents in both groups endorse patients taking on partial financial responsibility with payments to the host hospital for care.

Both groups reported that visiting teams were responsible for travel expenses, with the free flap group indicating a strong reliance (70%) on a small named outreach trip fund maintained by surgeons. Thirty-five percent in the free flap group relied on a large, private donor to sponsor these trips on a continual basis compared to 7% in the ablative group.

### 3.3 | On-site patient care and complications

Reconstruction of benign tumor defects account for most (72%) free flaps performed on outreach trips by the free flap group, with the remainder indications being oncologic (18%) and traumatic (10%) defects. The trend was similar within the ablative group: 70% performed surgeries for benign disease and 30% for malignancy or traumatic injuries. When reconstruction was indicated in the ablative group, this was performed using local facial ( $n = 30$ ), pectoralis ( $n = 29$ ), and supraclavicular ( $n = 6$ ) flaps.

Complications were recorded by surgeons and reported on the survey. The ablative group reported 18 hematomas, nine fistulas/neck infections, six airway emergencies, and four nerve injuries. The free flap group reported 19 fistulas/neck infections. The authors acknowledge that the total number of ablative cases was not captured in the survey, thus these complication rates cannot be fully contextualized. Free flap failures occurred in 12 (9.6%) of 125 cases. Early failures were managed by performing a secondary free flap in over half of these cases, while the others were addressed using regional pedicled reconstruction versus local wound care. Late failures after departure of the outreach team were reported in three (38%) of the eight total flap failures and required sacrifice/replacement with pedicled flaps. In an isolated case of mandibular graft failure, the mandible was left to swing. Some of the respondents reported in detail their complications speaking to the heightened recall of difficult outcomes. Considering the retrospective nature of this data, recall bias needs to be considered in the interpretation of results. We also acknowledge that

**TABLE 1** Long-term post-surgical care considerations

Consideration	Ablative group	Free flap group
Duration of direct patient care by outreach team after major surgery	33% 2–3 days 33% 4–6 days Remainder: outliers	33% 2–3 days 33% 4–6 days Remainder: outliers
Patient follow-up with local providers	Occurs 90% of the time	Occurs 100% of the time
Do local practitioners maintain contact with outreach team?	Yes, correspond using various internet applications and phone	Yes, correspond using various internet applications and phone
Radiation oncology available?	Average of both groups: 25% availability	
Medical oncology available?	Average of both groups: 41% availability	
Speech therapy available?	13% reported as available	39% reported as available
Dietician support available?	23% reported as available	7% reported as available

late free flap failures do occur and it is possible that a small number of such failures have occurred but not been identified due to the challenges inherent with follow-up in many of these settings, such that the failure rate can be accurately described as at least 10%. Table 1 elaborates on various factors to consider when planning long-term post-surgical care.

### 3.4 | Free flap-specific surgical considerations

Given the complexity of head and neck free flap reconstruction, the survey specifically queried surgical practices in this group. Some groups performed free flaps only if the indication presented itself (via walk-in clinics, average 1 per week), while others intentionally scheduled one per day with pre-trip coordination with local surgeons. Most surgeons used host hospital microscopes (62%) for microvascular work, 23% used loupes with 4.5x magnification, and one group transported their own microscope to and from the host hospital.

While all surgeons reported comfort with the idea of performing the same free flap procedures that they do at their home institutions, in practice, most preferred radial forearm and fibula free flaps. Preoperative vascular evaluation for fibula free flaps for all surgeons in these settings consists of palpation of the dorsalis pedis and posterior

tibial artery pulses. Twenty-seven percent of these surgeons additionally confirm distal lower extremity perfusion intraoperatively by placing a bulldog vascular clamp on the peroneal artery and confirming the distal system with a Doppler probe prior to separating the pedicle. Fifty percent of responders reported uneasiness regarding buried flaps and always incorporate a visible skin paddle for monitoring purposes.

Airway management in free flap cases varied. Nasal trumpets were successfully used for cases involving the lateral mandible or temporomandibular joint. For cases involving the anterior mandible or in hemimandibulectomy, the group was divided on airway management: 45% performed routine tracheotomy and the remainder used nasal trumpets.

### 3.5 | Education and training

Many outreach teams actively provide training to local surgeons at the host hospitals. Members of the ablative group reported that local surgeons served as the primary operator or first assistant in 80% of cases. This was the case 54% of the time in the free flap group, where a visiting resident or fellow was the first assistant in the remainder of cases. The presence and roles of US-based trainees on outreach trips differed based on pre-established education objectives. If the emphasis was placed on teaching local surgeons, the local surgeon functions at the level of a fellow, which occurred 33% of the time. If patient volume is instead emphasized, the local surgeon participates in cases as a first assistant, which occurred in another 33% of cases. The remainder of cases may have a variety of levels of participation, including from US-based trainees. The ablative group reported resident accompaniment in 77% of trips, while the free flap group traveled with residents and fellows 55% and 73% of the time, respectively.

### 3.6 | Ethical considerations of free flaps

Surgical outreach trips often raise questions regarding ethics of providing complex care in limited-resource settings. Here we discuss those survey questions that generated a wide range of open-ended responses.

*Question: Are there ethical constraints to performing free flap surgeries on outreach trips?*

*Responses:* 85% of ablative respondents said “yes” with an overall strong tone in the responses. One issue raised was the disproportionate amount of resources allocated per free

flap patient, which might otherwise be spread out to multiple other patients (33% of respondents). Sixty percent of respondents in this ablative group indicated that although they are credentialed to perform free flaps, they choose to not perform them in outreach trip settings due to the amount of postoperative care required. Nearly half of the respondents in this group indicated that the sites they serve have cases that could benefit from free flap reconstruction.

Of those that do perform free flaps, the largest ethical consideration is whether or not to perform them based on indication. The practice is widely accepted when performed for benign disease, but not so for malignant disease, particularly in settings where access to necessary adjuvant radiation therapy is very limited or unavailable. Teams that perform free flaps must also assess the ability of the host surgeons to manage complications that may arise, as it is very unlikely that the host surgeons are able to perform free flaps independently.

*Question: Are free flaps performed on outreach trips a good use of health-care resources?*

*Responses:* When asked if free flap surgery on surgical outreach trips is a valuable use of health-care resources, the ablative group was divided in half with strong opinions regarding resource utilization and local providers resenting the postoperative care needed. Respondents from the free flap group unanimously felt that these surgeries were worthwhile. Strong arguments by multiple surgeons suggested the possible questionable ethics of traveling to do numerous smaller, less complex cases (e.g., thyroid and parotid cases), thereby decreasing the income of other local surgeons who are unable to operate during this time. This further likely to leave more complex cases untreated, ones that would be well suited for visiting surgeons to help manage. This points to the benefit of focused resource utilization in treating fewer but more complex cases—particularly young patients with benign disease. In areas that lack local surgical expertise to treat small or large cases, this argument is not applicable.

*Question: Are there ethical concerns with training local surgeons to perform free flaps?*

*Responses:* Fifty-three percent of ablative respondents indicated it was inappropriate to offer microvascular training to local surgeons, while 91% of the free flap group felt it was indeed appropriate to do so.

Final ethical considerations are presented as open-ended considerations: “For a refugee population, I do not feel that offering this type of trip is ethical.” “Ethics are relevant to complex head and neck surgical

procedures and their indications and not specifically related to free flaps per se. Best surgery with appropriate indications should guide decision making and if a free flap is best solution it should be considered.” “The take-home point is that this needs to be a partnership rather than a Lone Ranger riding in to save the (free flap) day.” “Most important is to establish a local and long-term relationship.” “Not all sites and not all patients are appropriate for flap surgery. Must be smart and selective.”

#### 4 | DISCUSSION

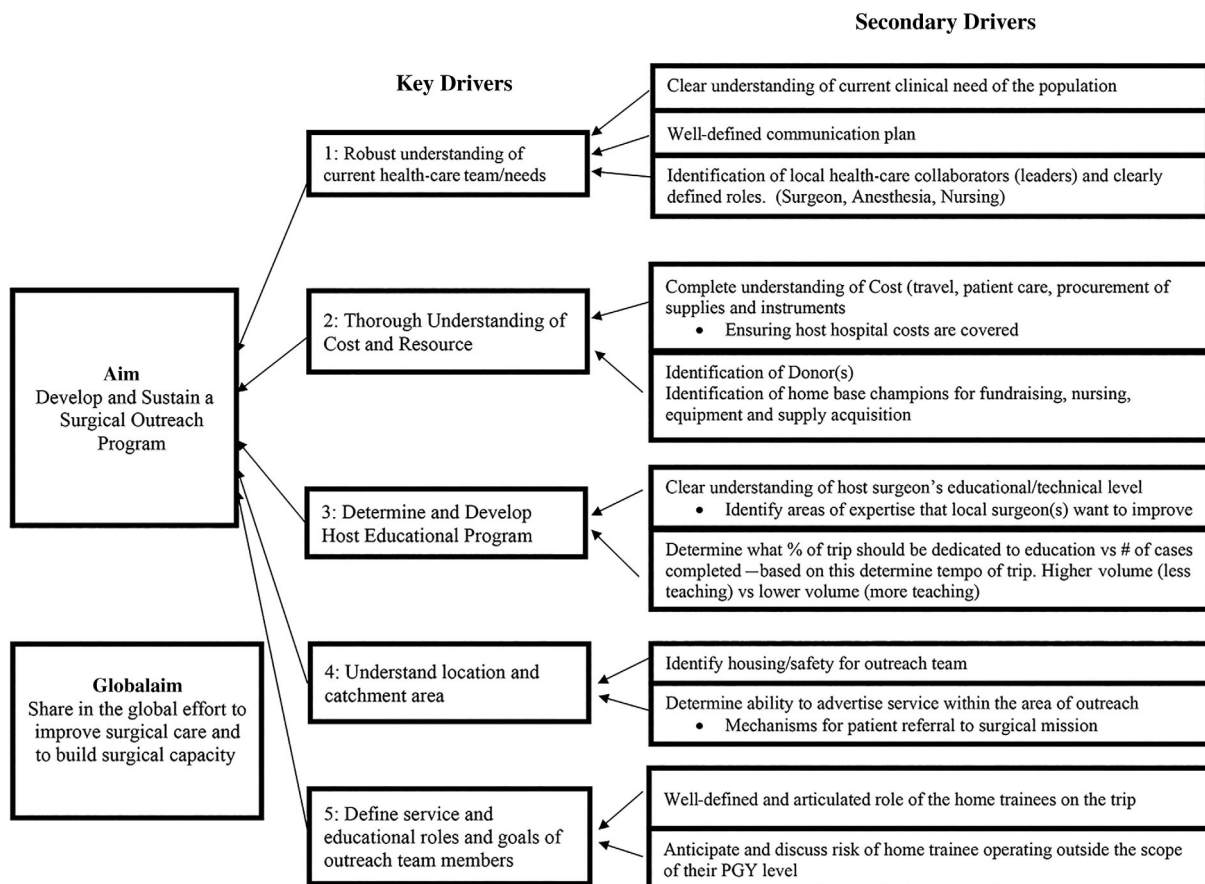
The survey employed in this study sheds light on efforts by US-based head and neck surgeons in outreach programs in low-resource settings, as well as the associated challenges and ethical considerations faced. Summary and synthesis of the survey results has led to the development of a key driver diagram visually displaying the contributing factors that lead to the success of a surgical global outreach program (Figure 1).

#### 4.1 | Financing outreach trips

Financing trips of this nature poses an ongoing challenge. Collectively, both the ablative and free flap groups noted that visiting participants are typically responsible for their own costs, and more than two-thirds of respondents in both groups endorse patients taking on at least some financial responsibility for their care. The most successful groups are those who have secured renewable funding through established partnerships with nonprofit foundations and/or companies. Financial stability is of great importance and allows outreach trips to be conducted on a repeat basis.

Throughout the literature on medical outreach trips, authors discuss the question of cost-effectiveness,<sup>1,9-12</sup> citing the high cost of short-term medical outreach trips both for the traveling team and the host hospital. Although cost to the host hospital is cited in the ethical considerations of this survey, we must strive to be financial fiduciaries as a governing principle of head and neck medical outreach trips. Currently 91% of free flap respondents reported direct payment to the host hospital to

**KEY DRIVER DIAGRAM - Surgical Outreach Development Plan**



**FIGURE 1** Key driver diagram of surgical outreach development plan



cover costs of all care, whereas only 27% of ablative respondents reported reimbursement for use of the host facility. Cost considerations include OR time that is taken from other local surgeons, supplies used, anesthesia time, nursing and travel. It is clear that both ablative and free flap groups were conscious of host resource utilization, but in different ways. The free flap respondents addressed this by bringing extensive supplies and directly paying the hospital for patient care. On the other hand, the ablative groups chose to keep a smaller footprint and consciously elected to use fewer resources. Our discussion of this topic intends to ensure we strongly consider our impact on host institutions.

## 4.2 | On-site patient care

Both the ablative and free flap survey respondents had significant common ground in approach to on-site patient care. In an article by Maki et al, the following concerns regarding medical outreach trips are articulated: lack of follow-up data, concern regarding poor relationship with the local health care system, and a lack of sustainable effort in a single location all leading to an overall negative effect.<sup>10</sup> The respondents in each group here also shared these concerns as ethical issues and ensure they are addressed as a central component of their outreach. Unfortunately, both groups had poor access to speech and language pathologists, dieticians, radiation oncology and medical oncology. This lack of access was likely a major contributing factor when prioritizing which surgeries to perform.

Despite the ethical and logistical challenges presented by a low-resource environment, the survey respondents were in strong agreement that the much-needed treatment of people in these regions is possible and often within reach. The African Head and Neck Society and an article by Cervenka et al suggest that successful treatment of head and neck cancers is possible in low-resource environments with adaptation to treatment methodologies.<sup>13,14</sup> Cervenka et al specifically suggest that it often involves upfront surgical resection and any involved or at-risk lymph nodes. To demonstrate, they elaborate that when adjuvant therapy or reconstruction is not available, alternative approaches to treatment are necessary.

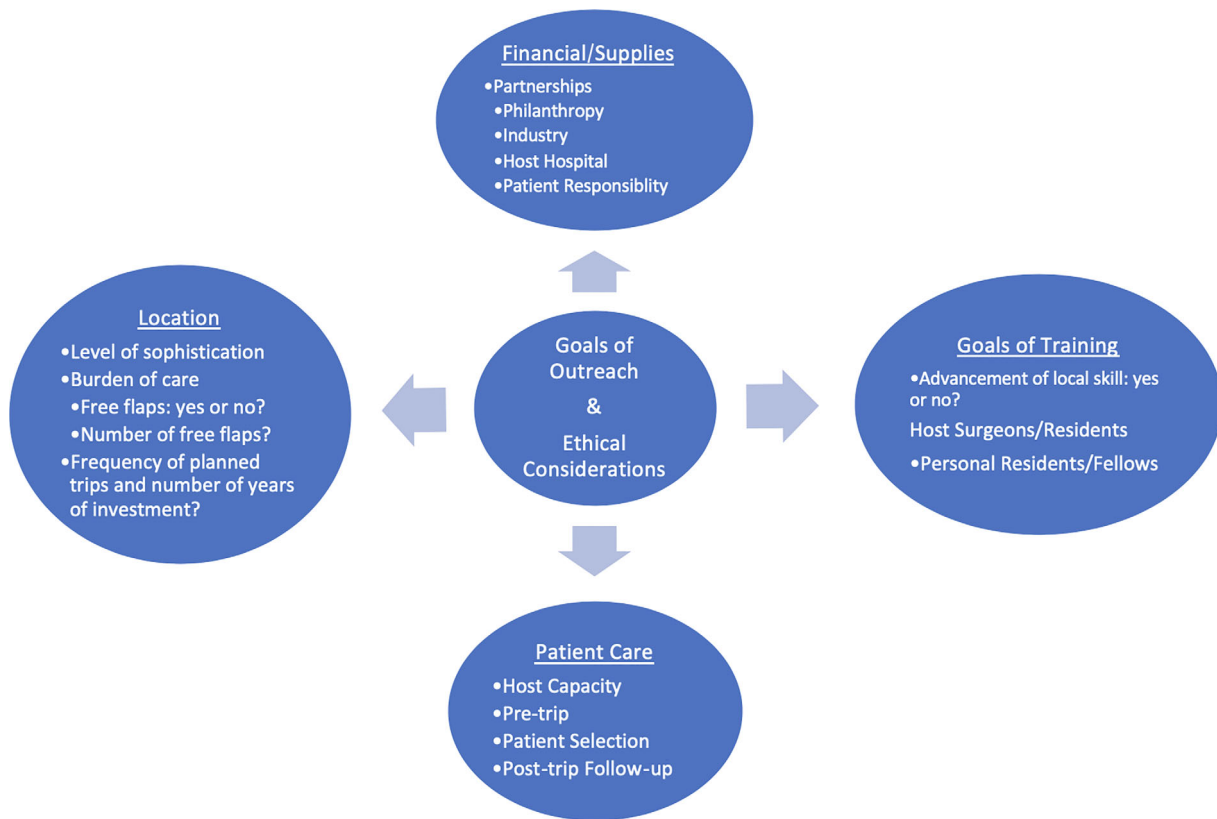
## 4.3 | Education and training of local surgeons and visiting participants

Many of the outreach teams actively provide training to local surgeons at host hospitals, as well as opportunities for US resident and fellow accompaniment. Both groups

reported that local surgeons served as primary operator or first assistant (80% ablative, 54% free flap). When educational advancement of local surgeons is a key objective for the leaders of an outreach trip, the local surgeon(s) should serve as primary surgeon to the extent possible with the visiting surgeon participating as they would with their own residents in the United States. While this approach inevitably lengthens operative time and decreases the potential number of patients directly treated during a short-term outreach trip, this may however extend to allow treatment of more patients if the surgical competency of local surgeons improves from such encounters. Education of local surgeons occurs far more seldom in free flap cases compared to ablative cases (54% vs. 80%, respectively). This occurs in situations where local surgeons are interested in learning to perform ablative cases, but care for patients who require free flaps. In these circumstances, visiting teams may perform the free flaps independently while the local surgeons participate in other concurrent cases. Ideally, this arrangement occurs in longer short-term trips (e.g. 2 weeks), where the visiting team may monitor for and address any complications that arise.

In addition to the advancement of local surgeons, outreach trips afford educational opportunities to US-based trainees as well, oft-criticized for several reasons. Trainees should be allowed to participate in such trips; however, their roles should be established and understood prior to travel, particularly on trips that prioritize educating local surgeons.

Central to head and neck surgery outreach trips is an effort to foster the education of local surgeons at the host sites. As an example, 90% of the free flap group indicated it is appropriate to train local surgeons to perform free tissue transfer and 60% purposely engage in training local surgeons. These efforts are best accomplished over an extended period of time with repeated visits to the same site working with the same team. It is beyond the scope of this survey to discuss the development of such a program; however, the authors, based on their long-term experiences, emphasize that is the deliberate training of local surgeons that allows such outreach to become sustainable. It would be the recommendation of the AHNS Global Outreach Committee that *Skills and Knowledge Transfer Assessments* be implemented in these settings to ensure accurate and complete educational initiatives. In addition, multiple respondents in both groups indicated the importance of coupling the trips with observerships whereby surgeons from low-middle income countries (LMICs) visit a US institution for a period of weeks to months. AHNS members have also advocated for and participated in short-term educational workshops at major academic centers in the developing world to



**FIGURE 2** Consideration of the goals of a humanitarian outreach initiative is multifactorial and can at times be in conflict with one another. Establishing the purpose and vision prior to the trip and refining as the outreach program matures will help protect ethical standards that are essential [Color figure can be viewed at [wileyonlinelibrary.com](http://wileyonlinelibrary.com)]

reinforce knowledge and skills as a type of continuing education.<sup>15</sup> Ultimately, these efforts are collectively directed at the Lancet Commission on Global Surgery to train surgeons in LMICs to be able to do more and have greater confidence.<sup>2</sup>

Visiting surgeons must reflect on their work in these settings and ensure their efforts improve the health of the affected communities and the education and well-being of the local surgeons under their tutelage (Figure 2). The former entails tracking patient outcomes either through the local surgeons or by communicating directly with patients. The latter involves ensuring that trips that provide free or low-cost care do not cause devaluation of the care provided by local surgeons in the absence of outreach teams. For this reason, it is important to encourage patients to pay for at least a small fraction of their care, a common practice in the majority of outreach trips surveyed here.

Limitations of this survey include those inherent to surveys, including selection bias among survey respondents (participants were invited and the survey was not made publicly available within the AHNS), as well as a small percentage of US head and neck surgeons surveyed. The authors also acknowledge that the survey

did not quantify ablative case volume and as a result may have underestimated total reported complications due to recall bias. Additionally, the open-ended questions on ethics presented a challenge in terms data analysis, but allowed for unrestricted responses to help the authors understand the ethical concerns of the respondents, an important consideration in any global outreach effort.

Overall, individuals who participate in medical outreach trips seek to use their skillsets to achieve positive contributions in these settings, both by treating patients directly and investing time in advancing the education of local surgeons. One respondent captured the essence of long-term goals for outreach efforts: “When setting up successful programs, there has to be an overarching plan of how the team will affect change both short term (take tumors out) and long term (train local physicians). Remember, education can never be taken away and really adds to the local medical care on a long-term basis.”

#### CONFLICT OF INTEREST

The authors have no conflicts of interest.

## DATA AVAILABILITY STATEMENT

We are happy to respond to reasonable requests for survey data.

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