Ethics in Practice

Global Orthopaedic Surgery

An Ethical Framework to Prioritize Surgical Capacity Building in Low and Middle-Income Countries

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Global surgery experiences and structured international surgical initiatives, which involve surgeons temporarily practicing in low and middle-income countries, are becoming increasingly common for North America-based orthopaedic surgeons and residents. For these surgeons, there are many benefits to engaging in such programs; however, the ethical challenges of minimizing harm while maximizing benefit during global surgery experiences are understated in the literature. In the present study, an ethical framework is presented for orthopaedic surgeons, particularly those in teaching programs, partaking in global surgery experiences. The primary objectives for international orthopaedic efforts should emphasize cultural competence, bidirectional education, upholding the principle of beneficence, and capacity building.

The Impetus for Addressing the Global Burden of Surgical Musculoskeletal Disease

There is a severe lack of access to surgical care, including orthopaedic surgery, in low and middle-income countries (LMICs). In these countries, the death toll from trauma outstrips the combined mortality burden of malaria, HIV/AIDS (human immunodeficiency virus/acquired immune deficiency syndrome), and tuberculosis. It is estimated that over the next 15 years, trauma-related disability will incur a loss of an estimated $7.9 trillion cumulative gross domestic product worldwide[1-3]. Orthopaedic surgeons can play a substantial role in addressing the worldwide burden of trauma. A recent study found that >20% of surgical cases completed during humanitarian deployments were orthopaedic[4]. The discrepancy of available resources in the United States and other high-income countries (HICs), as compared with LMICs, poses a serious challenge to altruistically minded surgeons who have not been exposed to resource-poor clinical settings during their training or practice. The mismatch of available technology in disparate clinical settings often leads to scenarios in which many surgeons struggle to adapt to low-resource conditions, which ultimately impact the quality of care provided during humanitarian efforts. This dynamic is exacerbated in the scenario of orthopaedic surgical trainees in LMICs[5-8].

Global Orthopaedic Surgery in LMICs: Is It Morally Justified?

Global surgery opportunities and international electives in LMICs for American orthopaedic surgeons and residents are typically framed as humanitarian endeavors and are rapidly gaining popularity[9]. There are many benefits for surgeons who embark on these experiences in association with nongovernmental organizations, academic institutions, or other groups. The increased volume and advanced pathology seen in LMICs may be perceived as an opportunity to learn as well as to provide benefit to the local population[10]. However, the potential for harm is similarly much greater in such clinical settings. The ethical challenges of minimizing harm while maximizing benefit during global orthopaedic surgery experiences are understated in the literature[6,11-13].

The oft-encountered challenges of global surgery experiences are compounded in orthopaedic surgical care, which

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is often indicated for quality-of-life improvement rather than just life-sustaining treatment. Orthopaedic surgery requires specialized tools and implants, as well as long-term patient engagement during rehabilitation for successful outcomes. Orthopaedic surgical care can result in severe morbidity and mortality if undertaken without proper technique, surgical resources, or optimal follow-up care, all of which are difficult to come by in resource-deprived settings.

There are many logistical barriers that impede the feasibility of orthopaedic international electives and global orthopaedic surgery experiences. The equipment necessary for complex orthopaedic care is often lacking in LMICs. Communication between visitor and host coordinators for these initiatives can be hindered by language and cultural differences. Aside from logistical matters, there are very serious ethical questions that require contemplation prior to permitting North American orthopaedic surgeons to embark on international efforts.

Justification for short-term humanitarian relief efforts has often hinged on a loosely based inverse application of the acts-omissions framework. This idea is often illustrated in palliative care with regard to euthanasia when it is argued that the omission of action (i.e., a physician doing nothing and "letting die") is morally favorable to the "act of killing."[14] This doctrine can be framed for the purposes of global health to suggest that surgeons from HICs who are not contributing their skills in a setting in which they are desperately needed are permitting harm and potential death to befall individuals in LMICs by way of omission of action. The moral argument is that the "act"—care provided by visiting surgeons and trainees from HICs, even if suboptimal compared with the standard acceptable in the home country of the visiting surgeon—would be superior to the "omission," which would result in the neglect and harm that patients might otherwise encounter in LMICs. However, this reasoning imperils the long-term care patients in LMICs receive and also enables a framework of surgical care that relies on external assistance, fails to provide local surgical capacity building, and plays into a morally dubious and unsustainable victim-savior paradigm[15].

The Global Orthopaedic Surgery Ethical Framework—A Collaborative Bidirectional Model

Through input and collaboration with bioethicists, orthopaedic surgeons experienced in global health, and resident physicians, we developed a preliminary 20-point ethical framework for use by American institutions and individuals seeking to embark on global orthopaedic surgery experiences and humanitarian work in LMICs. The purpose of this outline is to address ethical concepts relevant to global orthopaedic surgery and provide guidance for programs and individuals participating in these electives. It is recognized that not every point within the framework may be achievable in the face of infrastructural and pragmatic challenges. Indeed, many worthwhile international orthopaedic endeavors may not meet all of these criteria for various reasons. Rather, the checklist should serve as a starting point, with every item warranting serious consideration for implementation when possible. It is our hope that this framework will also function as a means to promote conversation and stimulate reflection on the ongoing practices in global orthopaedic surgery. Each item corresponds to 1 of 5 ethical principles used as the foundation of a moral framework to properly execute global orthopaedic efforts and structure international orthopaedic electives (Fig. 1). All items should be considered when applicable: (1) justice, the distribution of health resources in a fair manner; (2) beneficence, acting with intent to accomplish maximum good for the patient; (3) autonomy, allowing the patient to make informed decisions free from coercion and working to overcome language and cultural barriers; (4) nonmaleficence, acting to do no harm to the patient or society; and (5) solidarity, feeling social solidarity or union with community ideals.

Discussion

Solidarity and Special Ethical Considerations in Orthopaedic Surgery

Fractures take months—sometimes years—to heal, and orthopaedic surgeons place implants susceptible to infection or other hardware complications that remain with patients for extended periods of time. The nature of orthopaedic surgery is such that active participation from patients is necessary to maximize musculoskeletal function and outcome after surgical intervention. In the context of global health, these unique aspects of orthopaedic surgery dictate a more careful and longitudinal approach to the patient relationship than in other fields. For example, this longitudinal of facet postoperative recovery for orthopedic procedures is in contrast to cholecystectomies, appendectomies, or numerous obstetric procedures in which the offending pathologic tissue is excised and the obligation to monitor patients for complications from surgery is often shorter. Global orthopaedic surgery should prioritize facilitation of longitudinal care through transitions of care. Further, orthopaedic surgeons and trainees engaging in these efforts should participate in designing means of capacity building and near-peer education[16].

The principles featured in this framework were selected with consultation of the existing literature and consensus from the authors on the basis of their respective expertise and experiences. The objective was first to include principles commonly held in the professional ethos of physicians applicable to global health. We also sought to bridge gaps in prevailing wisdom evident in models of international surgical electives and global surgery by introducing the ethical principle of solidarity to guide behavior and considerations when developing an international orthopaedic program or partnership.

Solidarity is embodied by a commitment beyond empathy with others and by dictating willingness to act on their behalf. This principle espouses an approach to ethical decision-making built on the recognition that the fate of an individual is intrinsically tied to the fate of another. For our purposes, this notion is best described in the 2012 study by Prainsack and Buyx, which differentiated the 3 tiers of solidarity along interpersonal, group, and contractual levels and emphasized the importance of symmetry in relationships[17]. By emphasizing bidirectional teaching, the framework addresses the importance of symmetric relationships.

Global Orthopedic Surgery Ethical Framework: The Collaborative Bidirectional Model

PRE-GLOBAL ORTHOPEDIC SURGERY INITIATIVE
Set expectation for surgeons and trainees that the degree of clinical autonomy is not to exceed that permitted in the visitor's home country (NM, J, B, A, S)
Prioritize local surgical capacity building in LMIC in all planned activities from clinical services to planned didactics (NM, B, J, S)
Pre-screen patient cases and orthopedic-specific triage based on necessity, not novelty. Judgments to be made on maximal benefit and corresponding surgeon expertise (J, B, NM)
Ensure appropriate vaccinations and safety measures for visitor adjustment to host country (NM)
Establish mechanism for longitudinal clinical and radiographic outcomes such as fracture healing, hardware complications or infection with case based contingency plan for poor outcomes (J, B, NM)
Provide materials for visitor surgeon to gain knowledge of host country language, cultural norms, and to anticipate potential moral dilemmas. (J, B, NM)
Create implant inventory by pooling data of available visitor and host resources per each anticipated case (J, B, NM)
Complete needs assessment and written contract of learning objectives driven by host country data as well as collaborative bidirectional verbal input (J)
Plan for privacy conscious documentation of all surgical cases and clinical encounters completed (J, B)
DURING GLOBAL SURGERY INITIATIVE
Continuing assessment and prioritization of local surgical capacity building by including host surgeons and trainees in all aspects of elective from surgical indications, logistics, and clinical care (S, A)
Use shared decision-making model for surgical and nonsurgical indications respecting patient cultural beliefs and background. Ensure patient understanding of goals of surgery. (A)
Ensure transition of care to host country providers for follow up for each patient (NM, B)
Incorporate educational component coordinated by host country residents or surgeons for visiting team on topics less frequently encountered in visiting country (S)
Implement moral reasoning framework for dilemmas arising during elective (J, NM, B, S)
AFTER GLOBAL SURGERY INITIATIVE
Analyze case load for trends and orthopedic pathology most frequently encountered (J, B, S)
Create plan for building on elective foundations to prioritize local surgical capacity training (J, B, S)
Debrief with exit interviews, surveys, and reassessments of written agreement to understand whether visitor and host participants believe goals and objectives were met (NM, B, S)
Promote co-authorship of host and visitor residents on any research endeavors or academic discourse resulting from the elective/exchange (S)
Implement periodic follow up and identify and address complications (NM, B, J, S)

Fig. 1

List of items within the global orthopaedic surgery ethical framework, organized by before, during, and after the initiative. Each item includes the corresponding relevant ethical principle(s) in parentheses. NM = nonmaleficence, J = justice, B = beneficence, A = autonomy, and S = solidarity.

In assuming care for any patient, whether abroad or at home, a surgeon must embrace a sense of connection and responsibility for that patient. In global orthopaedic endeavors, the ethical approach of solidarity promotes responsibility for local capacity building to facilitate longitudinal care for patients. As described in the framework, the orthopaedic surgeon abroad acquires a sense of solidarity with their hosts prior to the elective through building a familiarity with the language, culture, and history of the LMIC in which the experience takes place. This principle is relevant to the field of global surgery as a whole, but particularly important for ethically sound international orthopaedics. It is thus a critical concept for orthopaedic surgeons to understand and apply in practice during international programs and humanitarian efforts.

The "Good Enough" Principle: An Ethical Quandary in Global Surgery

The question remains whether the quality of orthopaedic care delivered in LMICs by visiting surgeons can be of equivalent quality to that which would be acceptable in the home country of the surgeon or to the "best standards available."[18] In many cases the imaging and equipment technology available in HICs is not available in LMICs, and the care delivered is different from what would otherwise be expected. An example might be a young patient with a posterior hip dislocation with concomitant incarcerated femoral head fracture. In an HIC, the patient would usually be taken to the operating room within 6 to 12 hours for reduction. In an LMIC, acquisition of proper imaging for diagnosis and preoperative work-up can take substantially longer for such a patient as a result of extenuating circumstances. If methods that are less than the best available in an HIC are delivered in an LMIC, the actions can only be justified by satisfying the moral obligations for all parties and being deemed superior to the alternative means of care. Given that, without global surgical care, the alternative for many patients in LMICs might be forgoing treatment altogether because of limited resources, different standards of care in the context of global surgery may ultimately be acceptable and satisfy the

principles of beneficence and nonmaleficence. For global surgery experiences, the final judgment of what is considered the acceptable standard of care in a host LMIC should be made by the surgeons and patients of that LMIC.

The ethical framework presented in this article attempts to emphasize the importance of infrastructural support, surgical education, and empowerment of local health-care providers as the primary focuses for any global orthopaedic surgery initiative. These goals can be accomplished primarily by teaching and transferring skills to local surgeons to improve delivery of care in a sustainable manner. If that transference of skills is not accomplished, the international orthopaedic program is difficult to justify on a moral basis. Further, it is necessary to acknowledge that orthopaedic surgeons—and particularly trainees—from HICs do not often have the skills to operate with ease in austere environments. For example, surgeons in HICs would often perform operative fixation of a fracture with use of intraoperative radiographic imaging; however, surgeons from LMICs in which such imaging is unavailable may employ the use of other technology or tools (e.g., the SIGN IM [Surgical Implant Generation Network intramedullary] nail system [SIGN Fracture Care International]) to assist in the procedure. As such, surgeons from LMICs would be more familiar with the process of operative fixation in the absence of intraoperative radiographic imaging than would many surgeons from HICs[19]. Asynchrony between the preferred technique of the surgeon and the equipment available in an LMIC can result in more harm than benefit, thereby violating the principle of nonmaleficence. As such, humility is crucial from HIC orthopaedic surgeons and residents interested in global surgery. The mutual benefit and bidirectional learning opportunity for LMIC host surgeons and visiting HIC surgeons should be recognized and prioritized.

Justice, Autonomy, and Cultural Considerations

The goal of these international guidelines is to place the needs of the patient first in accordance with Western ethical reasoning. By attempting to provide patients in LMICs with care that is equal to that in HICs, international medical volunteers exercise the principle of justice as defined by John Rawls: justice emphasizes distributive fairness to produce societal good and is a core principle of the professional ethic of the physician in the provision of health-care services[20,21]. Presuming one regards all patients as having equal value and worth regardless of their socioeconomic status, ethnicity, religion, or other factors, international surgical endeavors and social justice work have clear moral value for physicians and surgeons. These guidelines take this principle further and emphasize that the focus should not only be on nonmaleficence, or avoiding harm, but also on satisfying the principle of beneficence to produce the most good possible. It is not enough to treat patients in LMICs as teaching subjects without inflicting explicit harm; volunteers should elevate the health and well-being of these patients. In orthopaedic surgery, this requires effective transitions of care to accommodate long-term follow-up and thus necessitates a component of local surgical capacity to enable this feature of care.

It is important to understand that the culture of the host LMIC may be at odds with Western ideology. Although justice, solidarity, beneficence, and nonmaleficence are ideals espoused by physicians worldwide, ensuring autonomy may be more culturally biased. Despite the intentions of the physician, paternalism has been the way medicine has been practiced for hundreds of years. The drive to do what one feels is best for the patient, regardless of the desires or level of understanding of that patient, is still the way medicine is practiced in much of the world and may feature in orthopaedic surgery, in which the details of surgical techniques are difficult to effectively communicate to patients.

In a case example by DeWane and Grant-Kels[22], a classic international medical ethical dilemma is proposed in which a local doctor tells a patient they have an infection and gives the patient an antibiotic cream instead of telling the patient they have advanced incurable skin cancer. In this example, the ethical reasoning of the local physician was to spare the patient and family anxiety in their final days as they could not do anything to ameliorate the situation, and dying from unknown causes was common and acceptable in that community. The visiting physician from an HIC did not agree with this decision and wanted the patient to know their diagnosis even though no help could be provided. Which physician is right? Should the physician from the HIC place their values above those of the host LMIC? We recommend respecting and adapting to the values of the local culture while maintaining adherence to beneficence and nonmaleficence[23]. Visitors should be encouraged to observe how care is delivered locally and inquire about local challenges to care provision prior to suggesting changes. Practicing the principles above, it is important to anticipate moral dilemmas, to have a plan in place to manage these dilemmas if the need arises, and to emphasize shared decision-making models of care[24].

Conclusions and Directions Forward

The current systems of care in LMICs are generally insufficient and incapable of handling the existing and growing burden of musculoskeletal disease. The crippling burden of musculoskeletal disease worldwide puts orthopaedic surgeons who are interested in humanitarian efforts in a unique position to contribute to the alleviation of suffering in resource-limited countries. Exposure to international training opportunities and humanitarian relief work benefits physicians and surgeons in training tremendously. However, enthusiasm for humanitarian surgical efforts may not always translate into ethically sound practices[25,26].

At their core, all international orthopaedic programs and humanitarian efforts should focus on the promotion of local capacity building while employing culturally sensitive practices. To do so, visiting physicians must not compromise the fundamental quality of patient care or undermine how the local population perceives the ability of the local physician to deliver care. Further, the visiting surgical team must endeavor not to leave local providers with complications that are unable to be addressed. In this vein, we have proposed an ethical framework

to approach international orthopaedic surgery based in the principles of justice, beneficence, autonomy, nonmaleficence, and solidarity. Specifically, we created a global orthopaedic surgery framework that will help to promote more ethically sound practices during orthopaedic surgical humanitarian efforts. The framework and items within are meant as recommendations to guide international orthopaedic surgery activity, with recognition that the goals outlined may not always be feasible to achieve. It is our hope this framework of moral considerations will ideally advance the dialectic on best methods for building international surgical capacity in LMICs and preparing orthopaedic surgeons worldwide to provide the highest standard of care for their patients. Future directions include establishing curricular milestones for residents and promoting global surgery ethical didactic exercises. These endeavors will build toward creating sustainable global health paradigms for orthopaedic surgeons to incorporate into their training programs, humanitarian relief work, and global surgery partnerships. ■

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