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Pediatric Orthopaedic Observerships in North America for International Surgeons

Perceived Barriers and Opportunities for Visitors and Hosts

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Investigation performed at UCSF Benioff Children's Hospital Oakland, Oakland, California

Background: Despite recommendations for high-income countries to partner with low-income and middle-income countries to expand surgical access, little is known about the barriers that are faced by international surgeons (ISs) who participate in short-term clinical observerships in North America and the barriers that are encountered by their North American (NA) hosts.

Methods: Surveys were distributed to ISs who participated in a pediatric orthopaedic observership in North America in 2009 to 2019 and their NA hosts to assess the perceived barriers that are faced by both partners and identify possible opportunities for improvement.

Results: Responses were received from 181 ISs and 46 NA hosts. The ISs reported facing a variety of barriers prior to, during, and after completion of their NA observerships, including financial burden, language and cultural barriers, and challenges with local accommodations and transportation. Only 49% of ISs reported that their NA hosts had sought feedback from them. Barriers noted by the NA hosts included financial burden, logistical challenges with hosting, language barriers, and lack of support from their co-faculty/staff. At least 43% of NA hosts reported that their observership program was unfunded. Based on the survey responses, potential areas that may enhance the observership experience include funding support, creating a centralized data bank of pediatric subspecialty opportunities that are available at each sponsoring institution, a pre-visit orientation for the visiting surgeon, improving inclusivity by addressing language and cultural barriers, improving access to observing surgical procedures, obtaining post-visit feedback, and creating a virtual community of international visitors and NA hosts for an ongoing exchange of ideas and resources.

Conclusions: The ISs who participated in a pediatric orthopaedic clinical observership and their NA hosts identified limited funding as a major barrier. There are several opportunities for enhancing this unique learning experience and exploring the role of contextual remote learning for all participants. Additional studies are needed to investigate the value of clinical observerships for ISs, including the downstream impact of such opportunities on capacity-building, bidirectional learning, and improving patient care.

Disclosure: The **Disclosure of Potential Conflicts of Interest** forms are provided with the online version of the article (<http://links.lww.com/JBJS/G591>).

Given the vast inequities in surgical care globally, as well as the recent recognition of surgical care as a critical component of universal health coverage, recommendations have been put forth for stakeholders in high-income countries (HICs) to partner with their low-income country (LIC) and middle-income country (MIC) counterparts to expand surgical access¹⁻³. Global surgical education has evolved from short-term medical missions in LICs and MICs to the development of sustainable partnerships that allow for mutual learning opportunities and the creation of funding and career paths that foster collective responsibility in addressing global inequities in surgical care². The need for improving surgical care in LICs and MICs is well known to the orthopaedic community⁴⁻¹¹.

Currently, many North American (NA) academic centers and professional societies provide international surgeons (ISs) short-term opportunities for clinical observerships^{5,7}. In an attempt to better understand the impact of such clinical observerships on ISs and their home countries, a recent study found that participation in an NA pediatric orthopaedic observership had a positive perceived impact on the majority of visiting ISs, did not contribute to substantial brain drain, and may assist with local capacity-building¹². Although the study by Carrillo and Sabharwal and other studies suggest an overall positive impact of short-term clinical observerships on the visiting ISs and their peers and patients, the challenges faced by the ISs and their NA hosts remain largely unknown^{5-7,12-16}.

TABLE I Barriers Perceived by International Surgeons*

Barriers	Total (N = 181)	ISs from LICs (N = 11)	ISs from LMICs (N = 52)	ISs from UMICs (N = 73)	ISs from HICs (N = 45)
IS predeparture barriers					
High cost	61 (34%)	3 (27%)	16 (31%)	31 (42%)	11 (24%)
Difficulty finding a faculty member sponsor	29 (16%)	1 (9%)	11 (21%)	13 (18%)	4 (9%)
Difficulty finding temporary housing	28 (15%)	2 (18%)	9 (17%)	9 (12%)	8 (18%)
Difficulty finding an observership program	24 (13%)	1 (9%)	7 (13%)	14 (19%)	2 (4%)
Difficulty obtaining a visa	12 (7%)	1 (9%)	3 (6%)	7 (10%)	1 (2%)
Discouragement from peers	9 (5%)	2 (18%)	3 (6%)	2 (3%)	2 (4%)
Discouragement from supervisors	9 (5%)	0 (0%)	2 (4%)	5 (7%)	2 (4%)
Difficulty passing health screening/other health issues	8 (4%)	1 (9%)	3 (6%)	1 (1%)	3 (7%)
Discouragement from family/friends	6 (3%)	1 (9%)	2 (4%)	1 (1%)	2 (4%)
IS barriers during observership					
High cost	38 (21%)	2 (18%)	11 (21%)	19 (26%)	6 (13%)
Difficulty adapting to a new health-care system	12 (7%)	1 (9%)	6 (12%)	5 (7%)	0 (0%)
Language barriers	8 (4%)	0 (0%)	0 (0%)	8 (11%)	0 (0%)
Cultural barriers	2 (1%)	0 (0%)	0 (0%)	2 (3%)	0 (0%)
Patients were not accepting of my presence	1 (1%)	0 (0%)	0 (0%)	1 (1%)	0 (0%)
Surgeons were unable to fit me into their daily routine	1 (1%)	0 (0%)	0 (0%)	1 (1%)	0 (0%)
IS post-observership barriers that prevented implementation of changes to practice					
Excessive workload	98 (54%)	7 (64%)	23 (44%)	38 (52%)	30 (67%)
Government/hospital lack of funding	93 (51%)	9 (82%)	23 (44%)	40 (55%)	21 (47%)
Lack of equipment	90 (50%)	9 (82%)	26 (50%)	37 (51%)	18 (40%)
Patient/family's inability to afford treatment	73 (40%)	7 (64%)	30 (58%)	28 (38%)	8 (18%)
Lack of appropriately trained support staff	64 (35%)	7 (64%)	19 (37%)	26 (36%)	12 (27%)
Patient/family's reluctance to accept suggested treatment	25 (14%)	4 (36%)	11 (21%)	7 (10%)	3 (7%)
Discouragement from supervisors	18 (10%)	1 (9%)	3 (6%)	10 (14%)	4 (9%)
Discouragement from peers	12 (7%)	1 (9%)	1 (2%)	9 (12%)	1 (2%)
Discouragement from friends/family	7 (4%)	0 (0%)	3 (6%)	2 (3%)	2 (4%)

*The values are given as the number of respondents who responded with "Considerably" (4 points) or "A great deal" (5 points) on a 5-point Likert scale, with the percentage in parentheses. IS = international surgeon, LICs = low-income countries, LMICs = lower middle-income countries, UMICs = upper middle-income countries, and HICs = high-income countries.

TABLE II Predeparture Information That International Surgeons Would Have Preferred to Receive*

Predeparture Information Type	Total (N = 181)
A program/observership schedule	58 (32%)
Information regarding temporary housing opportunities	52 (29%)
A web-based pre-visit orientation	52 (29%)
Information regarding leisure activities to do around your host-site's town	39 (22%)
Information regarding the institution/organization	34 (19%)
Information regarding health-screening requirements	21 (12%)
Information regarding how to obtain a visa	21 (12%)

*The values are given as the number of respondents, with the percentage in parentheses. Some respondents responded to >1 category.

Therefore, our primary aim was to assess the barriers that were perceived by the ISs who participated in a pediatric orthopaedic-focused observership and their NA hosts. Additionally, we sought to identify opportunities for improvement

based on feedback by the ISs and the NA hosts. We believe that the results of this study will provide an impetus to further enhance the value of these clinical observerships as orthopaedic surgeons strive to develop and strengthen contextual and sustainable global partnerships with their peers.

Materials and Methods

Survey Design and Distribution

Institutional review board approval was obtained. Two separate surveys, one for the ISs and another for the NA observership hosts, were designed to study the barriers and the opportunities for improvement of the pediatric orthopaedic observerships that are offered in North America to ISs (see Appendices A and B). Open-ended questions regarding the respondents' greatest perceived barrier, as well as changes they would like to see implemented, were also included. The investigators (L.A.C. and S.S.) developed the surveys based on gaps that had been identified in the literature, questions that were found in previously published surveys, and suggestions that were made by members of the Pediatric Orthopaedic Society of North America (POSNA) Evidence-Based Practice Committee^{5,7,17}.

Respondents included ISs who participated in a pediatric orthopaedic observership in North America (Canada or the United States) in the years 2009 to 2019 and resided outside of North America at the time of applying for their observership.

Approximate Total Out-of-Pocket Cost for an International Surgeon to Participate in an Observership

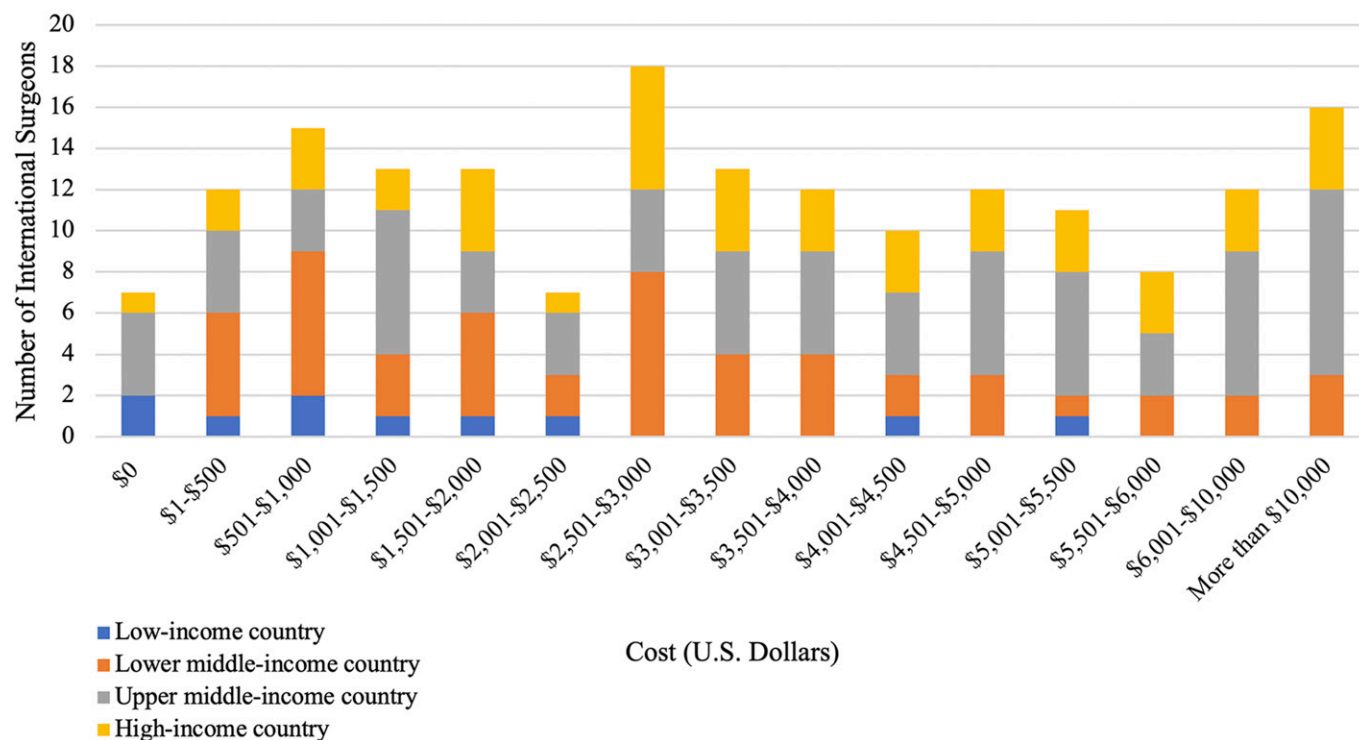


Fig. 1
Approximate total out-of-pocket cost for an IS to participate in an observership based on the income level of the visiting surgeon's country of residence.

TABLE III Methods Used by International Surgeons to Fund Participation in Observerships *

Method	Total (N = 181)	ISs from LICs (N = 11)	ISs from LMICs (N = 52)	ISs from UMICs (N = 73)	ISs from HICs (N = 45)
Self-funded	116 (64%)	4 (36%)	31 (60%)	54 (74%)	27 (60%)
Grant funding	56 (31%)	6 (55%)	21 (40%)	18 (25%)	11 (24%)
Institutional funding	49 (27%)	2 (18%)	12 (23%)	14 (19%)	21 (47%)
Departmental funding	16 (9%)	0 (0%)	3 (6%)	9 (12%)	4 (9%)
Industry funding	7 (4%)	0 (0%)	2 (4%)	4 (5%)	1 (2%)
Fundraising	1 (1%)	0 (0%)	1 (2%)	0 (0%)	0 (0%)

*The values are given as the number of respondents, with the percentage in parentheses. Some respondents responded to >1 category. IS = international surgeon, LICs = low-income countries, LMICs = lower middle-income countries, UMICs = upper middle-income countries, and HICs = high-income countries.

NA host respondents included program directors, program coordinators, and faculty members and/or other types of staff members who were involved in an NA pediatric orthopaedic observership during the same years.

The NA host survey was distributed electronically to active and senior members of POSNA (n = 1,008) and other individuals who were identified while contacting a number of the orthopaedic professional societies and academic institutions that may have offered an observership with a pediatric orthopaedic focus, as described in a recent web-based study¹⁸. The IS survey was sent electronically to ISs who were identified either by one of the POSNA members who had completed the NA host survey or by one of the formal pediatric orthopaedic observership programs that had been noted by Carrillo et al.¹⁸. ISs were asked to complete the survey based on the program that was indicated in their emailed invitation. ISs who visited >1 host site during the same trip were asked to provide an impression of their overall experience.

Anonymous survey responses were collected via Research Electronic Data Capture (REDCap) software from January to May 2020¹⁹. Participants were given the option to share their contact information if they desired to be acknowledged for study participation.

Statistical and Thematic Analysis

Descriptive statistics were calculated to analyze the IS and NA host cohort responses. The Cochran-Armitage trend test was utilized to determine any trends across the response categories using the income classification of the visiting surgeons' country of residence²⁰. As of the 2020 fiscal year, LICs were defined as those with a gross national income (GNI) per capita of ≤\$1,025 in 2018, lower middle-income countries (LMICs) were defined as those with a GNI ranging from \$1,026 to \$3,995, upper middle-income countries (UMICs) were defined as those with a GNI ranging from \$3,996 to \$12,375, and HICs were defined as those with a GNI of ≥\$12,376²⁰. Statistical analyses were performed using SAS (version 9.4; SAS Institute) statistical software and Excel (version 16.38; Microsoft). A value of p < 0.05 was considered significant. Open-ended responses were coded via thematic analysis.

Source of Funding

This study was supported in part by a POSNA Micro Grant.

Results

IS Perspective

After 3 participants were considered ineligible (due to incomplete responses) and 11 duplicate responses were excluded, the responses from 181 ISs who reported visiting at least 54 NA observership sites were analyzed. Demographic details of the ISs, including sex, age, and country of residence, as well as the perceived impact from their observership participation are referenced in a previous publication that utilized these data¹².

Predeparture Barriers

The most common predeparture barriers that were identified by the ISs included high cost (34%), difficulty finding an NA faculty sponsor (16%), and difficulty finding temporary housing (15%) (Table I). Additional predeparture barriers that were noted via free-text response included language barriers and difficulty arranging time off from their local clinical practice. The predeparture information that ISs reported not receiving but would have preferred to receive is outlined in Table II.

Barriers During Observership

During their observership, the most common barriers that were identified by the ISs included high cost (21%), difficulty adapting to a new health-care system (7%), and foreign-language issues (4%) (Table I). A significant association was identified between ISs from lower-income countries and having difficulty adapting to a new health-care system (p = 0.04).

High cost was the most commonly identified barrier, both prior to and during the observership. The reported median total out-of-pocket cost for participating in an observership was \$3,250 U.S. dollars. A significant association was found between ISs from lower-income countries and spending ≤\$3,000 for their total out-of-pocket costs (p = 0.006) (Fig. 1). Additionally, an association was identified between ISs from lower-income countries and the use of grant funding (p = 0.02) as well as between ISs

TABLE IV Themes and Representative Quotes from Visiting Surgeon Responses for the Greatest Perceived Barrier That They Faced and Their Suggested Changes for the Observership*

Theme	Greatest Perceived Barrier	Suggested Changes
Financial burden	<p>“High cost—expenses for accommodation”</p> <p>“Initial arrival costs”</p> <p>“High cost of living”</p> <p>“Lack of income whilst undertaking observership”</p> <p>“The most challenging for professionals who are eager to learn from North American colleagues is getting financial support”</p>	<p>“The cost of visa, travel, and accommodation is very high for people coming from low and middle-income countries, and maybe the scholarship fund needs to consider this”</p>
Excessive pre-observership health screening and other documentation requirements	<p>“Helping [with] the paperwork need[ed] before you start the observership”</p> <p>“Health screening—especially the TB screening test. Most Africans will react to PPD even when they are perfectly healthy. This is thought to be because of the BCG immunization.”</p> <p>“Application of J1 visa”</p>	<p>“A more streamlined application process”</p> <p>“For a novice, I think a support mechanism right from visa application process to eventual team participation during the fellowship would be very useful”</p>
Time away from family	<p>“Not able to travel with my family”</p> <p>“Leaving my baby behind”</p>	
Challenges with living accommodations and transportation	<p>“Moving around many centers at short intervals in an unfamiliar environment”</p> <p>“Accommodation”</p> <p>“Jet lag”</p> <p>“Cold weather”</p>	<p>“Web-based orientation”</p> <p>“Formal orientation within host institution and the surrounding neighborhood”</p>
Language and cultural barriers	<p>“Language barriers”</p> <p>“Difficulty understanding my accent”</p> <p>“Cultural”</p>	
Short observership duration	<p>“Duration of observership too short”</p>	<p>“Increased duration of observership”</p>
Lack of observership structure	<p>“Lack of a clear program/schedule”</p>	<p>“Enhance structure and relevant outcome measures”</p> <p>“Give an opportunity to present fellow’s work”</p> <p>“Participation in teaching and research activities”</p>
Lack of match between visiting surgeon’s subspecialty interest and clinical encounters observed at NA observership site	<p>“The goals of the observership should be asked before as some observers may not be into academic/ research practice. So, differentiate programs and type of involvement, as well as length of observership”</p> <p>“Less surgeries observation and more clinical discussions either with patients or charts”</p> <p>“Lack of patient category I’m specialized in”</p> <p>“I only wanted to advance in hand and nerve surgery. Where my observership turned out, they did very little of this, and there was no availability to grow as I wanted”</p>	<p>“Well-defined goals”</p> <p>“It would be very useful for an observer with special interest to be given a list of cases planned for the observership and to ask the observer what he/she wants to gain out of the observership to help achieve it”</p>
Limited time spent with NA faculty	<p>“Availability of time by attendings”</p> <p>“Provide more chances to participate in your normal schedule”</p>	
Perceived lack of trust from NA staff	<p>“Lack of trust from some part of the staff”</p>	
Lack of belonging to clinical team	<p>“Sometimes I have the feeling you—as observer—bother your mentor, which is understandable when he/she is busy”</p> <p>“Didn’t feel like I was part of a team”</p> <p>“Be accepted as a peer by host doctors”</p>	<p>“Encourage observer/visitor to share their experience with hosts”</p> <p>“Opportunity to share my knowledge, my professional experience and the difficulties to practice my profession in my home country”</p> <p>“Pre-communication with teams who are willing to welcome the scholar”</p>

continued

TABLE IV (continued)

Theme	Greatest Perceived Barrier	Suggested Changes
Feeling isolated as an observer	"I was the only observer during my term. It would be good to have 2 observers at the same time"	"Connect with other observers" "I would like to have been involved in any social activity during the observership"
Lack of familiarity with NA health-care system	"Adapting to the health system"	"To have a pre-course before about medical practice in the U.S.A."
Appropriate access to operating room	"The ability to scrub in for operative cases in order to see better and learn more"	"Allow scrubbing of international surgeons for the surgery even if they don't touch the patient during surgery, allow[ing us] to have a better look and understanding" "Since we are not able to scrub in during surgeries, maybe a cadaver lab or surgical skills lab would be nice"
Restrictive institutional policies	"Institutional restrictions" "Limited permission to join some activities" "Difficult to do research due to observer status"	
Negative impact on home country employment	"It turned out that North American fellowship was destructive for my career because of local (home country) perspective"	

*TB = tuberculosis, PPD = purified protein derivative, BCG = bacilli Calmette-Guérin, and NA = North American.

from higher-income countries and the use of institutional funding ($p = 0.01$) (Table III).

Post-Observership Barriers

Upon return from their observership, barriers faced by ISs when attempting to implement changes into their clinical practice included excessive workload (54%), lack of funding support by their local government/hospital (51%), and lack of appropriate equipment (50%) (Table I). Significant associations were identified between ISs from lower-income countries and the following post-observership barriers: lack of equip-

ment ($p = 0.03$), lack of appropriately trained support staff ($p = 0.04$), the patient's/family's inability to afford treatment ($p < 0.0001$), and the patient's/family's reluctance to accept suggested treatment ($p = 0.002$).

Fifty percent ($n = 91$) of the ISs reported satisfaction with the duration of their observership. An association was noted between ISs who participated in an observership for >4 weeks and having greater satisfaction with an observership's length ($p < 0.0001$). Only 49% ($n = 89$) of ISs reported that their NA hosts asked for their feedback on the observership experience. The most frequent themes that were identified as the greatest barrier faced by the ISs included language and cultural barriers, financial burden, and challenges with local living accommodations and transportation (Table IV).

TABLE V Barriers Perceived by North American Hosts*

Barriers	Total (N = 46)
Lack of funding	16 (35%)
Challenges with the logistics of hosting (e.g., scheduling oversight)	12 (26%)
Lack of faculty/staff to support the observership program	6 (13%)
Language barriers	5 (11%)
Difficulty developing relevant curriculum	4 (9%)
Difficulty obtaining honest feedback from international surgeons	2 (4%)
Cultural barriers	1 (2%)

*The values are given as the number of respondents who responded with "Considerably" (4 points) or "A great deal" (5 points) on a 5-point Likert scale, with the percentage in parentheses.

NA Host Perspective

After 1 participant was considered ineligible (due to an incomplete response) and 2 duplicate responses were excluded, the responses from 46 NA hosts from at least 31 NA sites were analyzed. The most common barriers that were identified by NA hosts included lack of funding (35%), challenges with hosting logistics (26%), and lack of faculty/staff support for the observership program (13%) (Table V). At least 43% of NA hosts reported that their observership program was unfunded. The top funding sources that were utilized included grant funding (24%), departmental funding (22%), and institutional funding (15%).

Additional obstacles that were noted via free-text response included difficulty having ISs participate in the operating room, lack of institutional interest in hosting ISs, and disruption of daily clinical activities, such as time taken away from teaching

TABLE VI Themes and Representative Quotes from North American Host Responses for the Greatest Perceived Barrier That They Faced and Their Suggested Changes for the Observership*

Theme	Greatest Perceived Barrier	Suggested Changes Quote
Large number of requests	"Too many requests to handle"	
Pre-observership international surgeon documentation and onboarding process	"Visa" "Paperwork" "Credentialing"	"A more formalized system for [on]boarding"
Challenges with hosting logistics (i.e., living accommodations, transportation, and observership organization)	"Day-to-day logistics since there are no accommodations at the hospital and the fellows need transportation" "Our observership is an informal arrangement between prospective candidates and 1 or more faculty members. It is ad hoc and not a program as such" "Coordination of visitor's time" "Trouble with organization in keeping them all busy and accounted for"	"More [...] administrative support" "Perhaps have a curriculum we all share. Also, evaluation systems" "A more formalized system for [...] transportation" "Solicit formal feedback on their experiences and how to improve" "Develop a stand-alone committee whose role it is to enhance this experience"
Financial burden	"Lack of financial support" "We would like to host more fellows from resource-poor countries but do not have funding"	"More funding" "Obtain a regular source of funding to increase accessibility"
Lack of interest among peer faculty/institution to host observers	"Unwillingness of many faculty to accept observers" "No institutional interest" "Less enthusiasm with benefit"	"The program should be PHYSICIAN led" "Recognition of the time investment that this type of program takes" "More commitment by current faculty to mentor visitors"
Language barriers	"Variance in ability to use the English language"	"Spend more time vetting their language skills"
Risk management, liability, and patient safety	"Risk management" "Additional source of contamination in OR" "Security" "Patient privacy"	
Time availability to host observer	"Adequate time"	
Disruption to and competition with other trainees	"Disruption to other trainees" "Competition with actual trainees for time" "Protecting resident and fellow education"	
Challenges providing access to hands-on experiences	"Unable to scrub unless licensable"	"Higher level of allowed participation (e.g., scrubbing in on cases rather than strict observation)"

*OR = operating room.

local trainees and negative impact on work relative value units (wRVUs)²¹. The most frequent themes that were identified as the greatest barrier faced by the NA hosts included financial burden, challenges with hosting logistics (i.e., living accommodations, transportation, and observership organization), and language barriers (Table VI).

Discussion

The primary goal of our study was to assess the barriers that were perceived by the ISs who participated in an NA short-term clinical observership and their NA hosts. Lack of funding was the most frequent barrier for both the visiting surgeons and the NA hosts. Examples of the financial burden that was faced by ISs included loss of income while participating in the observer-

ship and costs that were associated with their international travel, accommodations, transportation, food, and other living expenses while in North America. Financial burden was also noted by the NA hosts as their greatest barrier to hosting ISs. Lack of funding support for orthopaedic observerships had been noted in a previous study, and funding support for visiting surgeons was primarily available through professional-society-sponsored observership programs¹⁸. Alternative funding sources such as governments, institutions, departments, industry, nongovernmental organizations (NGOs), philanthropy, and crowdfunding are options that can be explored to help diminish the financial burden for all stakeholders.

Previous studies also have demonstrated the value of using an e-learning or blended learning approach (consisting

TABLE VII Potential Opportunities for Improvement to Address the Perceived Barriers Identified by the International Surgeons and the North American Hosts*

- Create a centralized data bank that can comprehensively list all observership opportunities and facilitate matching ISs with appropriate NA observership sites.
- Perform prescreening to match the clinical interests of the IS with the clinical expertise available at the NA site. The screening should be continued throughout the observership duration to ensure that the clinical interests of the IS are being met.
- Perform a prescreening to verify language proficiency to ensure that there are no major language barriers for the IS. Providing access to an interpreter, if feasible, may help, but this may add an additional burden to the NA host.
- Streamline the onboarding process and provide support to the ISs in completing pre-observership health screening and other required documentation.
- Provide the IS with information regarding affordable housing opportunities and a program/observership schedule prior to their arrival.
- Provide a web-based orientation for visiting surgeons to assist with easier transition to living in North America and observing in an NA health-care system.
- Identify a local NA physician champion who is from overseas or has had immersive experiences living in an environment similar to that of the IS.
- Improve institutional/departmental support for academic NA physicians who host ISs via appropriate recognition and compensation for their time and effort.
- Create an inclusive environment for international observers, such as through planned social activities, scheduling around departmental events or annual meetings, or providing opportunities for observers to connect with other observers and share their unique experiences and challenges.
- Offer e-learning or blended learning opportunities to enhance availability of educational and training resources that are accessible remotely.
- Enhance the ability for ISs to observe surgeries and gain surgical skills via additional means, such as Sawbones and cadaver laboratories, use of mounted cameras in the operating room with narration, or gaining permission for the observer to scrub in (as an observer) upon completion of an appropriate orientation to ensure patient safety.
- Identify everyone's role on the clinical team to ensure feelings of inclusivity for the visiting surgeon and reduce any potential conflicts with NA learners.
- Optimize the duration of observership based on the needs of the observer and availability of time and resources of the NA host.
- Provide ISs with a Certificate of Attendance at the completion of the clinical observership as a token of appreciation.
- Obtain feedback from ISs and NA hosts regarding the observership and make appropriate changes in an iterative manner.
- Explore alternative funding sources (e.g., professional society, government, institution, department, industry, NGO, philanthropy, and crowdfunding).
- Create a community of NA hosts and visiting ISs who regularly exchange ideas/resources and thus enhance the value gained for all stakeholders.
- Explore opportunities for creating sustainable partnerships between NA hosts and ISs (e.g., through research, education, capacity-building, mentorship, and bidirectional exchange of ideas and personnel).
- Partner with local institutions and licensing boards to enable ISs to have increased participation in short-term clinical training activities.

*NA = North American, IS = international surgeon, and NGO = nongovernmental organization.

of both e-learning and face-to-face instruction) in surgical training for a range of learners, including successful use in LICs and MICs²²⁻²⁷. The incorporation of such learning models for clinical observerships that are offered to ISs may enhance their learning experience while offsetting the financial burden. Additional advantages of these learning platforms include opportunities to scale across multiple sites globally to reach a much larger pool of surgeons, minimizing disruption to family and professional activities, and the potential for archiving such educational encounters. Currently, the remote learning modalities are even more relevant given the coronavirus pandemic and its impact on travel restrictions and social distancing. Limitations to the e-learning and blended learning models are also well documented, including issues with intellectual property, cost, internet connectivity, device ownership, English-language literacy, and content relevancy^{23,25,27}.

Only 49% of ISs reported that their NA hosts sought their feedback after the observership. To improve the experience and ensure an observership's relevance and sustainability, consistent evaluation systems can be put in place to collect feedback from all stakeholders. Such feedback may help to identify gaps

in an existing program's structure and content, and hopefully lead to a more mutually beneficial and impactful experience over time. Additionally, the opportunity for bidirectional learning that allows visitors to share experiences from their local practice, including innovative and cost-effective measures for addressing organizational and clinical issues, would bring a diversity of opinion and likely be beneficial for the NA hosts and their trainees.

It may also be valuable to prescreen potential international observers to understand if their learning needs can be met at the NA observership site. By matching the clinical interests of the observer and the host, there is greater likelihood for the development of a lasting partnership, which may result in future collaboration on clinical and research projects of mutual interest and an exploration of opportunities for bidirectional exchange. A similar prescreening method can be used to verify the language proficiency of the IS, which may assist with reducing the language barriers that have been noted by the ISs and the NA hosts. The availability of a centralized organization that provides ISs with detailed information about observership opportunities could also assist with the language proficiency assessment, streamline the health-screening and documentation

requirements, and appropriately match ISs with NA sites that can best meet their needs¹⁸. We also recommend the creation of a virtual community of NA hosts and ISs who can exchange ideas and resources on best practices for hosting ISs for clinical observerships. Such expanded partnerships could lead to the development of mutual and sustainable observerships that ensure that the needs of the ISs are met while taking into account the barriers that are faced by both stakeholders. Professional societies, such as POSNA and the American Academy of Orthopaedic Surgeons (AAOS), can help enable such relationships by creating an infrastructure for such scientific and cultural exchanges.

Furthermore, increased support and recognition of the work done by NA surgeons who are interested in global surgery by the leadership of their academic institutions and surgical departments could assist in reducing some of the barriers that are identified by the hosts. A recent survey of 36 U.S. academic surgeons involved in global activities identified protected time as an important way for their department to show support, and limited ability to have their international work count toward academic advancement was a major barrier to involvement in global health activities²⁸. Additionally, having a dedicated NA physician champion who is either from overseas or has had immersive experiences living in an environment similar to that of the IS may improve the experience and potentially reduce some of the cultural barriers that were identified in the survey.


Other suggestions to improve the bidirectionality of short-term clinical experiences for ISs include the creation of a new visa category and a temporary licensing category that allows ISs to have increased participation in short-term clinical training activities, as well as provide increased guidance for host institutions¹⁶. We have summarized a few potential solutions to the barriers that have been identified in this study (Table VII).

Several limitations were present in this study. A survey response rate could not be determined due to the methodology that was used to identify eligible participants and the lack of a centralized organization that tracked all of the ISs and the NA hosts who were involved in the orthopaedic observerships. We were also unable to match the host and observer responses to directly compare results due to the anonymous nature of the data collection. A recall bias is possible given that individuals may not be able to provide reliable responses to some of the questions. To reduce this issue, we limited responses to individuals who participated in an observership in the years 2009 to 2019. Additionally, those who had a more positive experience may have been more likely to complete the survey. The World Bank income classifications change yearly, and our analyses did not account for changes during the study period²⁰. Similarly,

the estimated total out-of-pocket costs that were reported by the ISs did not account for rises due to inflation during the study period, the varying lengths of the observerships, or the fact that ISs were coming from different parts of the world to various locations in North America. Lastly, it is unlikely that this study included all of the ISs and the NA hosts who were involved in a pediatric orthopaedic observership during those years. Nonetheless, we had a substantial number of NA host and IS respondents from diverse geographic and economic backgrounds. Moreover, to our knowledge, this is the first study that has specifically explored the perceived barriers and opportunities for growth from the perspectives of both stakeholders—the international pediatric orthopaedic observership participants and their NA hosts.

In summary, we have identified barriers that were perceived by ISs who participated in a pediatric orthopaedic clinical observership in North America and their NA hosts, and we have made some suggestions for improvement. Additional studies are needed to fully ascertain the downstream effects of such observerships on capacity-building and improving patient care. In the future, we plan to perform an in-depth qualitative study to explore the experiences of ISs and their NA hosts. Prospective longitudinal studies can also elicit site-specific evaluation of the barriers and the impact of observerships and provide paired analysis of partnering teams to further identify the drivers of sustainable partnerships.

Appendix

 Supporting material provided by the authors is posted with the online version of this article as data supplements at <http://links.lww.com/JBJS/G592> (<http://links.lww.com/JBJS/G593>) (<http://links.lww.com/JBJS/G594>). ■

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