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### Title

Clinical Observership Opportunities in North America for International Orthopaedic Surgeons.

### Permalink

<https://escholarship.org/uc/item/7704w9ns>

### Journal

Journal of Bone and Joint Surgery, 102(12)

### ISSN

0021-9355

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### Publication Date

2020-06-17

### DOI

10.2106/jbjs.19.01150

Peer reviewed

# THE ORTHOPAEDIC FORUM

## Clinical Observership Opportunities in North America for International Orthopaedic Surgeons

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

**Background:** Although efforts have been made to address the inequities of surgical care globally, to our knowledge, there has been no comprehensive analysis of orthopaedic clinical observerships in North America that are available for international surgeons.

**Methods:** Two investigators performed a systematic online search to identify orthopaedic clinical observerships that are available in the United States and Canada for international surgeons. Variables such as host type, geographic location of host site, program type, eligibility criteria, subspecialty focus, application and participation fees, availability of funding, duration of observership, and the quality of online information that is available based on an online content (OC) score were collected.

**Results:** Of the 113 available observership sponsors in North America, 36 (32%) were professional-society-based, 69 (61%) were academic/institution-based, and 8 (7%) were private-practice-based. Most observerships were located in the U.S. ( $n = 85$ ) and, of these, the Northeast was the most common U.S. region ( $n = 29$ ,  $p = 0.008$ ). Of the observerships with a focus, pediatrics was the most frequent orthopaedic subspecialty ( $p < 0.0001$ ), followed by spine and trauma. Professional-society-sponsored observerships offered funding to international surgeons more often than academic/institution-based and privately sponsored programs ( $p < 0.0001$ ). The average OC score for the entire cohort was 2.35 and was similar among the 3 host types ( $p = 0.954$ ). The program structure and requirements such as applicant eligibility, application and participation fees, and duration of observership varied widely.

**Conclusions:** There are opportunities for international orthopaedic surgeons to participate in clinical observerships in North America. Given the greater funding support and lack of fees for professional-society-sponsored observerships, these observerships may pose fewer financial barriers for surgeons from low and middle-income countries (LMICs). The quality of online information was similar among the 3 different host types and can be improved.

**Clinical Relevance:** The relevance and impact of a clinical observership experience in North America for a practicing orthopaedic surgeon from an LMIC need to be explored further.

**Disclosure:** The authors indicated that no external funding was received for any aspect of this work. On the **Disclosure of Potential Conflicts of Interest** forms, which are provided with the online version of the article, one or more of the authors checked "yes" to indicate that the author had other relationships or activities that could be perceived to influence, or have the potential to influence, what was written in this work (<http://links.lww.com/JBJS/F801>).

Approximately 5 billion people lack access to safe, affordable surgical and anesthesia care across the world, and an urgent need to address the large inequities of surgical care globally has been identified<sup>1</sup>. There are major barriers to accessing surgical care in many low and middle-income countries (LMICs), including a lack of facilities, equipment, and clinical expertise<sup>2</sup>. The United Nations' proposed Sustainable Development Goals have led to recommendations as to how high-income countries can work alongside LMIC partners to build sustainable surgical systems<sup>3</sup>. Some efforts have been made to close this gap, including the creation of global collaborations and other training programs to create sustainable development.

Many North American orthopaedic centers and professional societies provide practicing international orthopaedic surgeons the opportunity to observe, learn, and share various aspects of musculoskeletal clinical care and research<sup>4,5</sup>. Some international medical graduates utilize clinical observerships to familiarize themselves with North American medical practices in preparation for a residency program. However, orthopaedic observerships also may be pursued by practicing surgeons from LMICs who are interested in acquiring new clinical skills and knowledge, and they often return to their home country to use the newly acquired skills and share them with their trainees and peers.

In 1992, the American Orthopaedic Association held a conference on international orthopaedic education, where it was identified that a "system was needed to match individual orthopaedic surgeons' (regardless of country of training) educational needs with available resources."<sup>6</sup> The International Center for Orthopaedic Education (ICOE) was created to bridge this gap and facilitate the international exchange of postgraduate orthopaedic educational experiences through the creation of a free online database. From 1994 to 2005, orthopaedic surgeons from approximately 115 countries used the ICOE's service<sup>6</sup>. Numerous testimonials described the benefits to the global orthopaedic community and their patients<sup>6</sup>. Unfortunately, this database is

no longer active today, which may contribute to some of the challenges that international orthopaedic surgeons currently face when seeking advanced learning opportunities in North America.

While some reports have commented on the potential impact of a few short-term international scholarship programs for international surgeons<sup>4,5,7-9</sup>, there is little discussion regarding the overall availability and types of North American observerships that are currently offered to international orthopaedic surgeons. Given the large burden of disability and death from musculoskeletal injuries globally<sup>10</sup>, the purpose of our study was to assess the spectrum of orthopaedic clinical observerships that are currently available in North America, which may be found via an internet search, for practicing overseas surgeons. We anticipated that the results of our study would be relevant to all stakeholders interested in educational opportunities for visiting international orthopaedic surgeons, especially those from LMICs.

### Materials and Methods

After consultation with a librarian who was familiar with doing web searches, 2 investigators (L.A.C. and B.S.) independently performed 3 types of incognito website searches on the Google Chrome browser using the Google Search Engine during April and May 2019. Institutional review board approval was not required.

First, the American Academy of Orthopaedic Surgeons (AAOS) and the 23 orthopaedic specialty societies as listed on the AAOS Board of Specialty Societies webpage ([https://www.aaos.org/About/Board\\_of\\_Specialty\\_Societies/?ssopc=1](https://www.aaos.org/About/Board_of_Specialty_Societies/?ssopc=1)) were used to complete searches with the following 3 search terms: "X International Scholarship," "X International Observership," and "X International Fellowship," where "X" was the name of the orthopaedic professional society. Each webpage, or "hit," that was listed on the first page of the search results was reviewed.

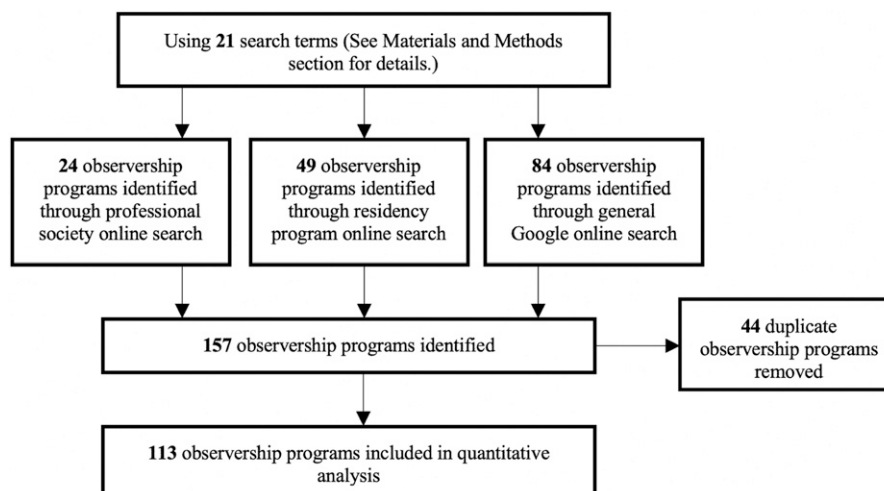
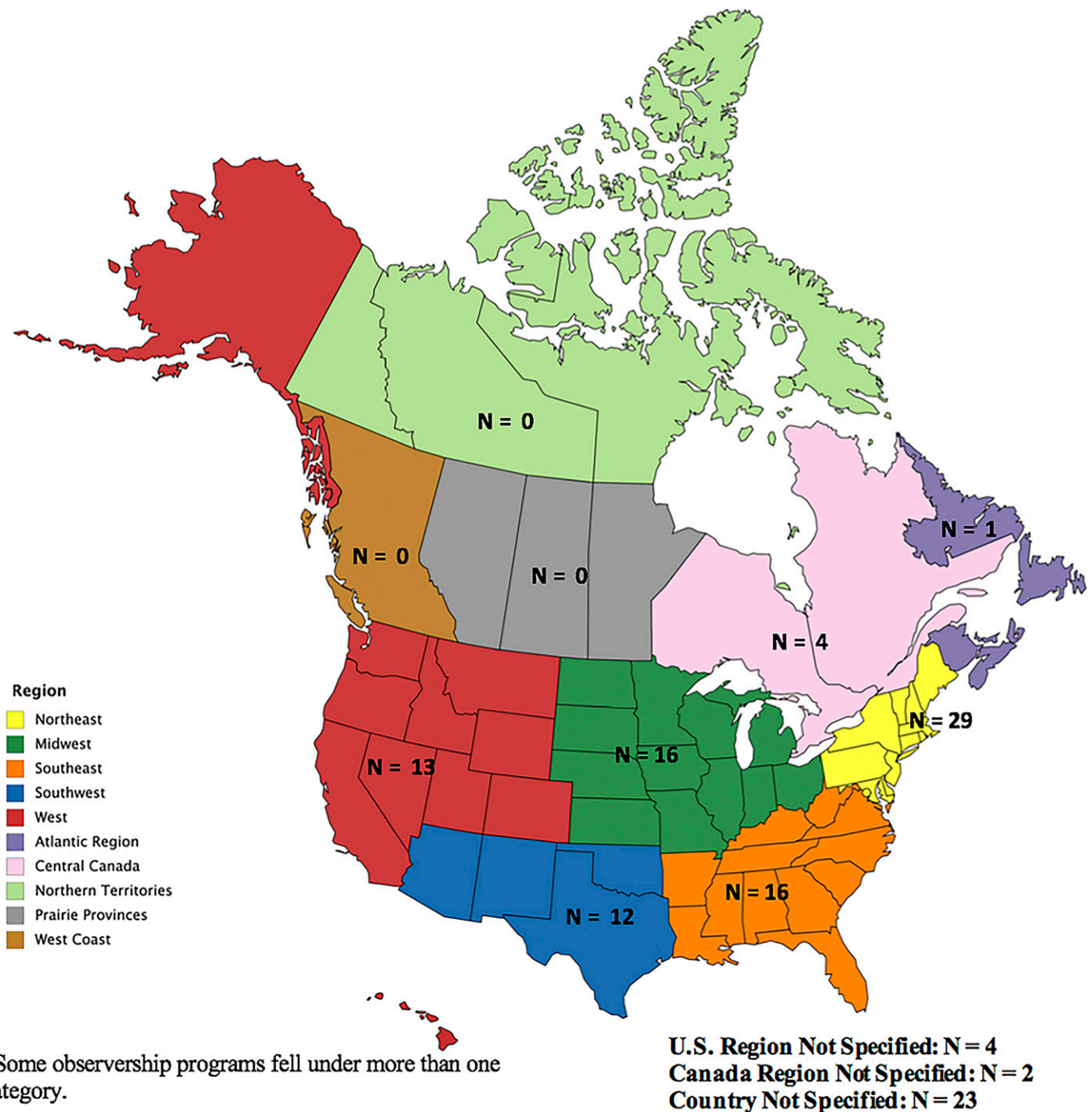


Fig. 1

Flow diagram for the systematic online search of available North American orthopaedic observership programs for international surgeons.



\*Some observership programs fell under more than one category.

Fig. 2

Locations of available North American orthopaedic observership programs for international surgeons.

Second, the 151 U.S. orthopaedic residency programs that are listed on the Electronic Residency Application Service (<https://services.aamc.org/eras/erasstats/par/index.cfm>) and the 17 Canadian orthopaedic residency programs listed on Orthogate (<https://www.orthogate.org/residency-programs/canada>), as referenced in March 2019, were used to complete searches with the following 6 search terms: “X Orthopaedic Scholarship,” “X Orthopaedic Observership,” “X Orthopaedic

Fellowship,” “X International Orthopaedic Scholarship,” “X International Orthopaedic Observership,” and “X International Orthopaedic Fellowship,” where “X” was the name of the program. Each webpage, or “hit,” that was listed on the first page of the search results was reviewed.

Third, a general online search was performed using the following 12 search terms: “Orthopaedic Scholarship,” “Orthopaedic Observership,” “Orthopaedic Fellowship,” “International

**TABLE I Observerships Available Based on Host Type\***

	Professional Orthopaedic Society (N = 36)	Academic/Institution (N = 69)	Private (N = 8)	Total (N = 113)
Type of program				
Orthopaedic-specific observerships	31 (86%)	31 (45%)	2 (25%)	64 (57%)
Observerships that include orthopaedics	5 (14%)	9 (13%)	0 (0%)	14 (12%)
Observerships with the possibility of including orthopaedics	0 (0%)	29 (42%)	6 (75%)	35 (31%)
Program geared toward applicants from†				
LMICs	15	1	0	16
Non-LMICs	8	3	0	11
Not specified	21	65	8	94

\*LMIC = low and middle-income countries. The values are given as the number of programs, with the percentage in parenthesis. †Some observership programs fell under >1 category.

Orthopaedic Scholarship,” “International Orthopaedic Observership,” “International Orthopaedic Fellowship,” “Surgical Scholarship,” “Surgical Observership,” “Surgical Fellowship,” “International Surgical Scholarship,” “International Surgical Observership,” and “International Surgical Fellowship.” Each webpage, or “hit,” that was listed on the first 10 pages of the search results was reviewed.

Observership programs were stratified according to the host type (i.e., professional society, academic/institution, or privately sponsored programs). Each program was then assessed to identify the following details, if available, on the program’s webpage: geographic location of the host site (by North American country and geographic region), type of program

(orthopaedic-specific observerships, observerships that include orthopaedics, or observerships with the possibility of including orthopaedics), applicant eligibility (applicants from LMICs, non-LMICs, or not specified), orthopaedic subspecialty focus, application and participation fee requirements, availability of funding support, and duration of the observership.

Each website for the orthopaedic observership programs that are available to international surgeons was evaluated based on the online content (OC) score, which included the following: any mention of an observership program offered to international orthopaedic surgeons, contact information for the observership program, a list of learning objectives to be met

**TABLE II Orthopaedic Observership Subspecialty Focus\***

Subspecialty	Professional Orthopaedic Society (N = 36)	Academic/Institution (N = 69)	Private (N = 8)	Total (N = 113)
Arthritis and joint replacement	1	3	1	5
Arthroscopy	1	2	0	3
Foot and ankle	2	3	0	5
Hand, elbow, and upper extremity	4	4	0	8
Hip	1	1	0	2
Knee	3	0	0	3
Limb deformity	1	0	1	2
Oncology	1	2	4	7
Pediatric	5	11	0	16
Rehabilitation	0	2	0	2
Spine	7	4	0	11
Sports	1	6	1	8
Trauma	3	6	0	9
Not specified	8	46	3	57

\*Some observership programs fell under >1 category.

TABLE III Observership Fees and Funding\*

	Professional Orthopaedic Society (N = 36)	Academic/Institution (N = 69)	Private (N = 8)	Total (N = 113)
<b>Application fee</b>				
Yes	0 (0%)	13 (19%)	1 (13%)	14 (12%)
No/not specified	36 (100%)	56 (81%)	7 (88%)	99 (88%)
Mean (range) (U.S. dollars)		\$358 (\$36-\$775)	\$186	\$343 (\$36-\$775)
<b>Participation fee</b>				
Yes	0 (0%)	17 (25%)	1 (13%)	18 (16%)
No/not specified	36 (100%)	52 (75%)	7 (88%)	95 (84%)
Mean (range) (U.S. dollars)		\$148 per day (\$6- \$600 per day)	\$3 per day	\$137 per day (\$3- \$600 per day)
<b>Funding available</b>				
Yes	26 (72%)	7 (10%)	0 (0%)	33 (29%)
No/not specified	10 (28%)	62 (90%)	8 (100%)	80 (71%)
Mean (range) (U.S. dollars)	\$10,370 (\$1,674- \$56,000)	\$58,000		\$12,355 (\$1,674- \$58,000)
Amount not specified	3	6		9
<b>Non-cash assistance provided</b>				
<b>Food</b>				
Yes	0 (0%)	1 (1%)	0 (0%)	1 (1%)
No/not specified	36 (100%)	68 (99%)	8 (100%)	112 (99%)
<b>Housing</b>				
Yes	1 (3%)	2 (3%)	0 (0%)	3 (3%)
No/not specified	35 (97%)	67 (97%)	8 (100%)	110 (97%)
<b>Travel</b>				
Yes	2 (6%)	1 (1%)	0 (0%)	3 (3%)
No/not specified	34 (94%)	68 (99%)	8 (100%)	110 (97%)

\*The values are given as the number of programs, with the percentage or range in parenthesis.

by the visiting surgeon during the observership program, and a webpage specifically for the observership program<sup>11</sup>. Each observership website was assigned an unweighted score of 0 to 4 depending on how many of the above criteria were met. The OC score and the scoring system were adapted from the sub-internship (SI) score, which was previously used to grade the OC of orthopaedic subinternships by Rai and Sabharwal<sup>11</sup>.

Data were collected independently by 2 investigators (L.A.C. and B.S.). Differences were reconciled through discussion and consensus between both investigators. If a consensus was not reached, it was resolved with the senior author (S.S.). Duplicate programs that came up in multiple searches were removed (Fig. 1). Each named program was counted as a single program, regardless of the number of sites or positions offered to overseas applicants. Only programs that advertised in English were considered.

The variables that were included for comparative analysis among different host types were geographic location of the program, subspecialty focus, availability of funding support, and the quality of online information that was available according to the OC score. All other variables were collected for

descriptive purposes only. SPSS Statistics for Windows (version 22; IBM) was used to perform the statistical analysis. The chi-square test was used for categorical variables when comparing among groups. The level of significance was set at  $p < 0.05$ .

## Results

Based on our web search methodology, we identified a total of 113 North American orthopaedic observerships that are available to international surgeons (see Appendix). Of these clinical observerships, 36 (32%) were sponsored by professional societies, 69 (61%) were academic/institution-based, and 8 (7%) were privately sponsored programs.

Regarding the geographic location of the observerships, of the 90 programs where the location was specified, 83 were located only in the U.S., 5 were located only in Canada, and 2 were located in both the U.S. and Canada. Of the 81 programs where the U.S. geographic region was specified, most were located in the Northeast U.S. region ( $n = 29/81$ ,  $p = 0.008$ ) (Fig. 2). A majority of the programs that were identified were orthopaedic-specific observerships ( $n = 64$ ), and most did not

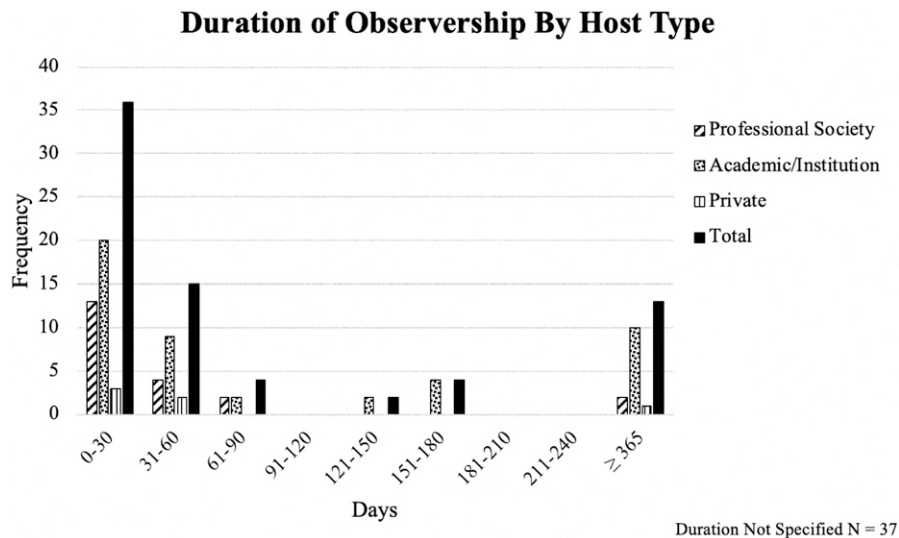


Fig. 3  
Duration of observerships by host type.

specify whether the program was geared toward applicants from LMICs versus non-LMICs (Table I).

When comparing the offered observerships based on orthopaedic subspecialty, pediatrics was most common ( $p < 0.0001$ ), followed by spine and trauma (Table II). When comparing the funding support provided to a visiting surgeon based on the host type, more professional-society-sponsored programs offered funding to visiting surgeons ( $p < 0.0001$ ) (Table III).

There was wide variability in the application and participation fees and observership duration among the professional-society, academic/institution, and privately sponsored programs (Table III and Fig. 3). The average duration of an observership for the entire cohort was 117 days (range, 4 hours to 2 years). For professional-society-sponsored programs ( $n = 36$ ), the average duration was 65 days (range, 3 days to 1 year) (not specified,  $n = 13$ ). For academic/institution-sponsored programs ( $n = 69$ ), the average duration was 139 days (range, 4 hours to 2 years) (not specified,  $n = 22$ ). For privately sponsored programs ( $n = 8$ ), the average duration was 119 days (range, 2 weeks to 2 years) (not specified,  $n = 2$ ). The average OC score for the entire cohort was 2.35, and was similar

among the 3 host types: 2.31 for professional-society, 2.38 for academic/institution, and 2.38 for privately sponsored programs ( $p = 0.954$ ) (Table IV).

### Discussion

The primary goal of our study was to identify and assess specific characteristics of North American observerships that are currently available to practicing international orthopaedic surgeons. We intended to simulate a web-based search that a practicing overseas surgeon may undertake when looking for an opportunity to observe orthopaedic practice in North America. We also attempted to provide a comprehensive list of orthopaedic observership opportunities for visiting surgeons, especially for those from LMICs.

Based on our simulated online search strategy, we identified 113 North American sponsors. Several of these programs offered multiple positions in a variety of geographic locations. We found that most North American orthopaedic observerships were located in the U.S., particularly in the Northeast ( $n = 29, 36\%$ ), the Midwest ( $n = 16, 20\%$ ), and the Southeast ( $n = 16, 20\%$ ) regions. Interestingly, academic institutions from these U.S. regions also offered the largest number of

**TABLE IV** Number of Observerships According to OC Score\*

OC Score	Professional Orthopaedic Society (N = 36)	Academic/Institution (N = 69)	Private (N = 8)	Total (N = 113)
0	1 (3%)	2 (3%)	0 (0%)	3 (3%)
1	5 (14%)	5 (7%)	1 (13%)	11 (10%)
2	12 (33%)	27 (39%)	3 (38%)	42 (37%)
3	18 (50%)	35 (51%)	4 (50%)	57 (50%)
4	0 (0%)	0 (0%)	0 (0%)	0 (0%)

\*OC score = online content score. The values are given as the number of programs, with the percentage in parenthesis.

orthopaedic subinternships<sup>11</sup>, which suggests that these regions may have a greater density of training centers and academic resources with the means to host trainees.

The 3 most common subspecialty-focused orthopaedic observerships were in pediatrics, spine, and trauma. This finding may be related to the nature of musculoskeletal pathology that is noted in resource-challenged environments worldwide, such as congenital, posttraumatic, and postseptic deformities of the limbs and spine. Additionally, North American professional orthopaedic societies and individual surgeons from these subspecialties and the local surgeons from LMICs may have a greater awareness of the challenges that surgeons face worldwide regarding these clinical problems.

We observed a notable difference in funding provided according to host type, with more professional-society-sponsored observerships offering funding to international surgeons than academic/institution-based and privately sponsored programs. Professional-society-sponsored observerships also did not require additional application or participation fees. Given the greater funding support and lack of fees, professional-society-sponsored observerships seem to pose a lower financial burden for visiting surgeons, especially those from LMICs.

Another interesting finding was the lack of a substantial difference among the 3 host types when comparing the quality of the online information based on the OC score. Generally, all host types had very similar web content available to the international surgeon seeking online information regarding a clinical observership. As mentioned previously, a similar scoring rubric was used by Rai and Sabharwal<sup>11</sup> to characterize orthopaedic subinternships, as well as by Rozental et al.<sup>12</sup> to characterize orthopaedic surgery department websites. Consistent with these reports, our findings suggest that North American orthopaedic observership programs may be underutilizing the internet as a way to promote the program and offer detailed information to prospective applicants. It is conceivable that if the observership programs were to display more detailed information, such as common pathologies encountered and the types of surgical cases performed in their institution, along with the program's learning objectives, the overseas surgeon would be able to make a more informed choice regarding the relevance of such a clinical experience for his or her individual needs and hopefully have a more impactful educational experience. Given the lower financial burden that international orthopaedic surgeons may face when participating in a professional-society-sponsored observership and the role that professional societies have in leading education efforts, we believe that professional-society-sponsored observerships, in particular, should take greater advantage of the internet to promote their observerships.

While our findings may be pertinent to both the international orthopaedic surgeons seeking advanced learning opportunities overseas and the current/potential North American hosts, our study had limitations. First, our study was restricted to the orthopaedic observerships that we were able to identify

based on our search strategy. It is highly likely that additional observership opportunities were not identified based on our limited search terms, and these may have been announced via other media such as newsletters, magazines, or email announcements, or may involve other professional societies. For instance, the AO Foundation offers observership-like fellowships in spine and trauma, which our search did not identify (<https://aospine.aofoundation.org/education/fellowship>; <https://aotrauma.aofoundation.org/education/fellowships>). The investigators discussed the option of contacting an expanded pool of professional societies and institutions but did not carry out this approach due to the risk of introducing selection bias. We also did not verify whether each of the identified observerships was still active or if it had previously hosted international surgeons. It is plausible that more comprehensive information about an observership was available but could not be found because the website was challenging to navigate or the pertinent information was not available in English. We purposefully limited our search to programs advertised in English because English fluency is often a requirement for observerships in the U.S. and Canada. Access to information technology expertise and administrative support for the North American observerships are other aspects that can impact the quality of online content, but they were not evaluated in our study. Additionally, observership program websites are not the only way in which international surgeons can learn about observerships. International surgeons may utilize their networks, including senior surgeons, other colleagues, and personal contacts, to identify informal observerships or obtain additional information regarding the programs. However, it is likely that the internet is one of the primary means that international orthopaedic surgeons utilize to gain information while seeking North American observerships.

We attempted to measure the quality of online information for observerships using an OC score. However, this score has not been validated. Another limitation of the OC score is its inability to account for the readability of the content or the ease of finding the webpage.

To our knowledge, this is the first study that reports on and provides a repository of existing North American clinical observership opportunities for international orthopaedic surgeons. It lays the groundwork to revitalize a database similar to the ICOE database that had been used in the past<sup>6</sup>. Given the positive impact that this resource may have on the education of orthopaedic surgeons worldwide and the health of their patients, this report also identifies the need for creating an educational clearinghouse that has more detailed information on the various clinical observership opportunities in North America that are available to an overseas surgeon so that the surgeon can make a more informed decision before embarking on a long and potentially expensive journey. The development of a structured curriculum that is tailored to the clinical needs of visiting surgeons, especially those from LMICs, would be optimal but would require a concerted effort and substantial investment from all stakeholders, including the North American hosts and professional societies.

Future studies on this topic should assess the potential barriers of such observerships from the perspectives of both the



international orthopaedic surgeons and their North American hosts, and also study the impact of such observerships on the participant's clinical skills, professional growth, diffusion of knowledge to peers, and the health of the patients in their home country. Since a visiting surgeon's and North American host site's intentions to participate in an observership are often unknown and could include secondary gains, such altered motives can decrease the potential value of such opportunities in reducing global inequities.

In summary, our findings, which are drawn from a web-based review, demonstrate a variety of opportunities that are available for international surgeons who wish to participate in North American orthopaedic observerships. Improved online content and a more structured clinically relevant curriculum may enhance the clinical observership experience of visiting orthopaedic surgeons. With the ubiquitous availability of the internet, this may be a unique opportunity to enhance global surgical capacity by providing relevant musculoskeletal care knowledge to surgeons in LMICs via appropriate North American observerships. We also must assess the effectiveness and relevance of these learning opportunities to evaluate whether a positive and sustainable impact is being made in the visiting surgeons' patient populations and to help reduce universal disparities in musculoskeletal care.

## Appendix

**eA** Supporting material provided by the authors is posted with the online version of this article as a data supplement at [jbjs.org \(http://links.lww.com/JBJS/F802\)](http://links.lww.com/JBJS/F802). ■

Note: The authors thank María Cuenca Torres (Hospital Universitario de La Ribera, Alzira, Valencia, Spain) for assistance with the statistical analysis.

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