

# Evaluation of Content and Accessibility of Orthopaedic Trauma Fellowship Websites

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## Abstract

**Background:** Residents frequently use the internet to find material on fellowship programs. The Orthopaedic Trauma Association (OTA) website serves as a central hub for information on an orthopaedic trauma fellowship (OTF). This study aims to evaluate the accessibility, content, and perceived importance of OTF websites.

**Methods:** We reviewed the 49 OTFs accredited by the OTA fellowship database as of January 2014. We searched for corresponding OTF websites by using the provided OTA hyperlinks and conducting a separate Google search of program location and institution. Links to websites of general orthopaedic programs were not counted. Content of OTF websites was analyzed by noting the presence or absence of specific items in fellow education (11 items) and recruitment (5 items).

**Results:** Of 49 OTFs, a total of 39 (80%) websites specific to the fellowship were identified by searching the OTA database and Google browser. Seven (14%) programs listed on the OTA database provided links directly to fellowship programs. Most programs (28; 57%) did not provide links to specific OTFs or provided non-functional links on the OTA website. Of the 39 accessible OTF websites, a total of 24 (61%) had complete information regarding recruitment and 14 (36%) provided complete details on education.

**Conclusions:** Most accredited OTFs do not adequately use the internet to provide easily accessible and complete information. Further details (especially regarding the role, education, and schedule) would help prospective candidates in thoroughly evaluating programs. The discrepancy in content and accessibility can hinder prospective fellows from appropriately investigating fellowship programs.

## Introduction

The Orthopaedic Trauma Association (OTA) website<sup>1</sup> serves as the central hub for information about the orthopaedic trauma fellowship (OTF). As of January 2014, the database listed a total of 49 programs supported by the Accreditation Council for Graduate Medical Education (ACGME) and other OTA-accredited organizations. The OTA website offers detailed information about each OTF, including contact information and links to program websites.

Most research that evaluates the websites of graduate medical programs and online program resources is specific to residency programs. Nevertheless, the similarities in match process and program overlap allow these studies to be generalized. In 1999, Winters and Hendey<sup>2</sup> surveyed 60 emergency medicine residents and showed that 82% had visited the program website before submitting their application. More recently, results of a 2011 study by Chu et al<sup>3</sup> showed that 98% of 210 anesthesia residents routinely visited residency program websites during the application process. Participants indicated the quality and content of the websites directly affected decisions about application submission.

Several studies have explored residency program websites and their effect on the match process across various fields of medicine.<sup>2-8</sup> However, to our knowledge, the only investigation on orthopaedic surgery fellowships was conducted by Mulcahey et al<sup>9</sup> in 2013. This study evaluated the content and accessibility of websites for fellowship programs in sports medicine accredited by the American Orthopaedic Society for Sports Medicine (AOSSM). The study concluded that the fellowship program websites did not provide adequate links to

fellowship pages, and some fellowship programs lacked functional websites altogether. In comparing the data to similar studies, the researchers concluded that AOSSM fellowship programs were underusing the web as a resource for programs.<sup>3,5,8,9</sup>

Mulcahey et al<sup>9</sup> also evaluated fellowship program websites for specific content items related to fellow education and recruitment. In a similar study, Mahler et al<sup>7</sup> found that geographic location was the only factor reported to be more important to applicants than an easily navigable and complete residency program website. Accessibility to application information was as influential to residency program related decisions as input from fellow students and mentors. Kumar et al<sup>5</sup> came to similar conclusions regarding pediatric residency program websites, in that programs with higher match rates tended to have more user-friendly websites. Ease of navigation was highly regarded across studies, whereas site aesthetics were not found to be significantly regarded in any of the studies evaluated.<sup>4,5,9</sup>

We aimed to evaluate OTA-accredited program websites for content and accessibility in a similar manner to that of Mulcahey et al.<sup>9</sup> Our goal was to expand on their results and additionally evaluate the perceived importance of fellowship program websites by distributing a survey to fellowship program coordinators. The objectives of this study were (1) to evaluate the links to fellowship program websites as listed on the OTA website; (2) review the content on the fellowship program websites; (3) assess results of surveys to determine any perceived importance of the internet as a communication tool for fellowship programs; and (4) compare our data with that of previous research to relate two different orthopaedic fellowships.

## Methods

The OTA website is easily navigable. The homepage provides the “Fellowship Match & Resources” tab, serving as the main database. The fellowship directory and information were accessed in February 2014, though the date of the most recent update was not provided. The 49 OTFs listed had individual pages of contact and descriptive information. The data gathered included website links, contact information of program coordinators or directors, and university affiliation information.

The fellowship programs were evaluated for accessibility by using three methods: a direct website search, a Google search of the program name, and another Google search of the institution. The websites were initially located with the links provided on the OTA website. Additionally, a Google search was conducted using keyword phrases of “{program name} + Orthopaedic Trauma Fellowship” and, if

necessary, “{associated institution} + Orthopaedic Trauma Fellowship.” The websites linked directly from the OTA database were divided into three categories: fellowship information, general orthopaedic program information, or non-functional links. For the Google searches, the first 30 results (three pages) were analyzed individually, with a similar evaluation as done with those listed on the OTA website. Search results that linked to general program websites (without any reference to the trauma fellowship) were not counted. The searches using associated institutions were conducted if no fellowship information was obtainable by the previous two. No unique websites were found using these methods; thus, websites were analyzed for content only. Google searches were conducted on January 25, 2014.

Fellowship program websites were evaluated for content in several areas established as important to residency applicants.<sup>2,7,8</sup> The criteria used were adapted from those described by Mulcahey et al,<sup>9</sup> which evaluate program websites based on two categories: fellow education and recruitment. To maximize objectivity, the presence or absence of content items was noted and no evaluation of quality or validity of information was done. The presence of the following items was independently evaluated for each website: didactic instruction, journal club, research requirements, rotation schedule, call responsibilities, team coverage, outpatient and clinic, research listing, common case descriptions, links to major orthopaedic societies, and the role of the fellows. Information pertaining to these items was considered present if any mention of the items was noted on the fellowship program website or linked pages. Information more likely to be directed toward fellow recruitment was analyzed by the same method. The items evaluated in this category included description of program, application information such as links and information referring to San Francisco (SF) Match,<sup>10</sup> salary, current or former fellows, and current faculty members.

Using contact information provided by the OTA website and searchable links if necessary, we contacted the fellowship program coordinators or directors to determine the perceived importance of the website as a recruitment tool. Initially, all program coordinators listed on the OTA website were emailed a brief survey. Some email addresses were non-functional. These programs were contacted by phone twice throughout the week of April 31, 2014, once in the morning and once in the afternoon. The questions asked were as follows: (1) What is the best way for fellow applicants to obtain information about your program? (2) Does your program maintain a fellowship program website? (3) How often is your program website updated? (4) How important is the website as a recruiting priority on a scale of 1-10 (10 being very important)?

## Results

The OTA provided a central database that contained links for 28 of the 49 programs (57%). The remaining 21 programs did not provide links. Of these 28 programs with links, a total of seven (25%), fourteen (50%), and seven (25%), respectively, linked directly to fellowship websites, orthopaedic program websites, and non-functional websites (Figure 1).

Results of a Google search for the 49 listed OTFs located 37 (76%) programs. Of these searchable programs, a total of 29 (78%) were the first result listed, with the remaining eight sites in the top 10 (first page) of results. Two of the fellowship websites could only be located through extensive navigation in the program website, with no mention of the fellowship on the first 30 Google results (first three pages). These websites were considered unsearchable. Of the 28 programs with functional links on the OTA directory, a total of 18 websites (64%) could be located within the first 10 results of a Google search (Figure 2).

The 39 fellowship program websites found from the OTA database and using Google searches were analyzed for content in two categories: fellow education and recruitment. Of the 11 education content items analyzed, the websites contained on average 6.4 items (median, 6). Almost all websites provided common case descriptions (95%), information on research requirements (90%), and discussed the role of fellows in the program (87%; Figure 3). Although the large majority (90%) discussed the program research requirements, only 18 programs (46%) listed current or past research and 10 programs (26%) mentioned journal club meetings. Didactic instruction was referenced by 22 (56%) of the websites. Most fellowship program websites discussed the role of outpatient clinic (69%), whereas less than half mentioned a rotation schedule (46%), team coverage (44%), or call

responsibilities (33%). Seventeen programs (44%) provided links to important orthopaedic societies, such as the OTA or AAOS.

Websites were also evaluated for content specific to fellow recruitment (Figure 4). The websites were searched for 5 related items, with an average of 3.7 items (median, 4) found. All 39 of the fellowship program websites provided a description of the program. Thirty-five programs (90%) listed information about current faculty members, and 20 (54%) listed current or former fellows. Of the recruitment items, fellow salary was found on the fewest number of websites (51%). Application information, including links to the OTA or SF Match, was present on 30 websites (77%).

All 49 programs were contacted for participation in this study. Sixteen program coordinators (33%) responded to the emailed questionnaire or were reached by phone. When asked about the best way for applicants to obtain further information, a total of eight (50%) directed applicants to a specific website, whereas the other 50% directed applicants to online resources provided by the governing bodies of the match. Five fellowship program coordinators (31%) referred potential applicants to the OTA website for further information. Three coordinators (19%) referred applicants to the SF Match website for further information. Coordinators with functional websites were asked how often the fellowship program website was updated. Seven (44%) were updated on an annual basis and three (19%) were updated several times or on a rolling basis. The rest of the respondents either did not have websites or did not know the frequency of updates. Coordinators were also asked to rate the importance of their program website as a recruiting priority for their program, with use of a scale of 1 to 10. The average response between all respondents was 8.5 (median, 8; range, 7-10).

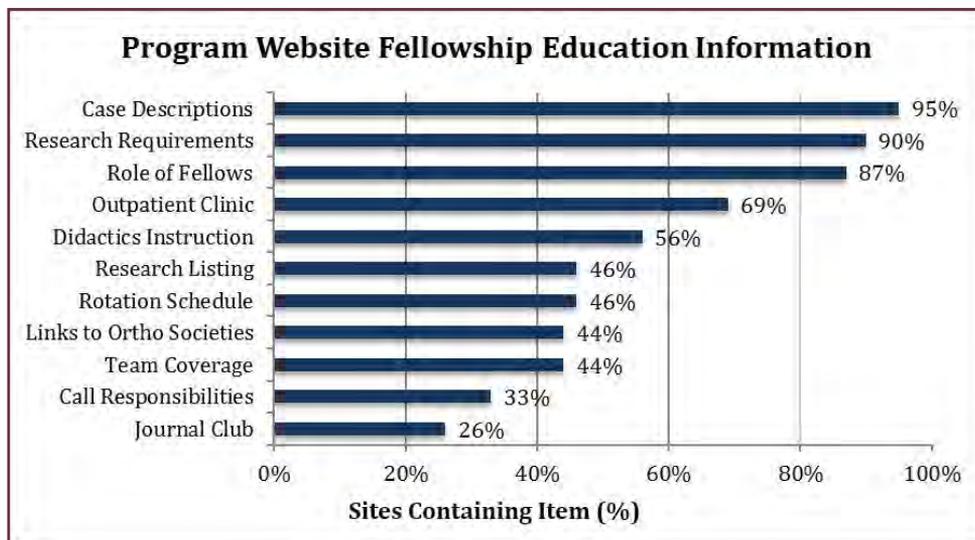


Figure 1. Flowchart detailing the accessibility of fellowship program websites from links listed on the Orthopaedic Trauma Association website.



Figure 2. Flowchart detailing accessibility of fellowship program websites that were identified using the Google search engine.

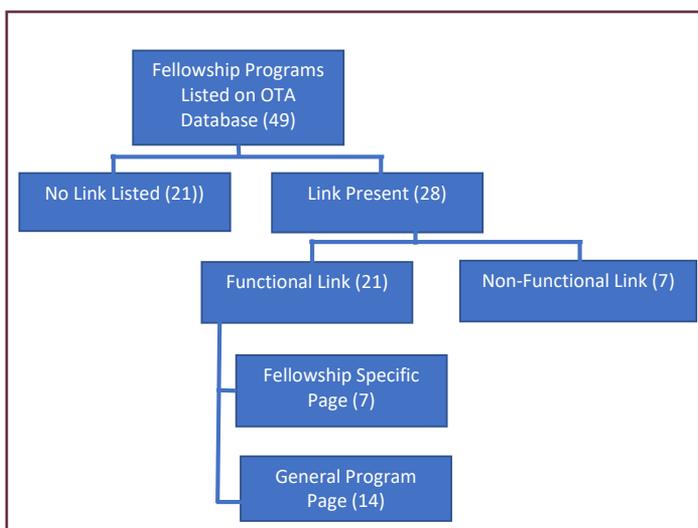


Figure 3. Percentage of fellowship program websites containing fellow education specific content items (n = 39).

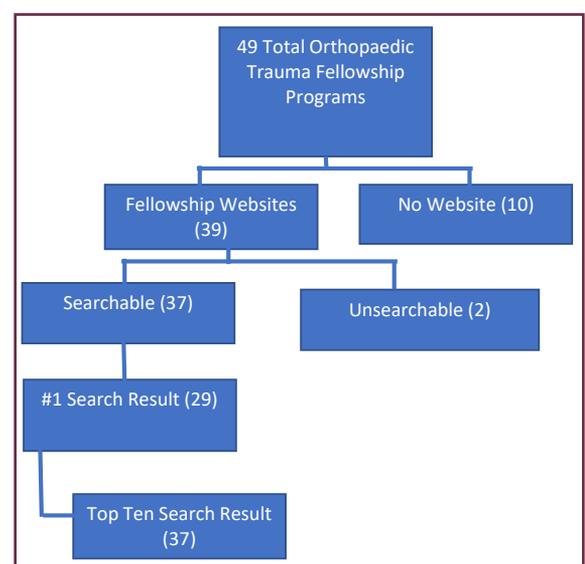


Figure 4. Percentage of fellowship program websites containing fellow recruitment specific content items (n = 39).

## Discussion

Prospective applicants for accredited OTFs need to be able to easily find accurate and up-to-date information about fellowship programs of interest. The OTA website serves as the central database that is home to a directory listing information for the 49 accredited fellowship programs, which is easily accessible without any login or credentialing information. In the current study, both the SF Match website<sup>10</sup> and most fellowship program coordinators directed individuals seeking further information to this central database.

Results of our study found that the OTA database provided functional links to websites of 43% of the accredited programs. Of these functional links, one-third linked to fellowship material. A Google search for

the same information provided fellowship information for 76% of the programs listed on the OTA website. All websites were found within the first page of search results (top 10), and 78% of the searchable websites were the first result listed. This may indicate that many more fellowship program websites exist that are not linked on what is considered to be the most complete source of information regarding the OTF match. Although surprising, this lack of easily obtainable updated information does not seem to be an isolated problem. Numerous studies have shown deficiencies in residency program websites.<sup>6-8</sup> Results of a more recent study showed that the AOSSM website, which serves as the central database for the sports medicine fellowship match, only contained functional links for 44% of accredited programs.<sup>9</sup>

Results of previous studies<sup>2-4,8,9</sup> have indicated that websites for graduate medical education programs are becoming increasingly important tools both for recruitment by programs and information gathering by applicants. Applicants competing for coveted positions are disadvantaged by lack of information.<sup>10</sup> The competitive nature of the match and individuality of each program speaks to the need for easily obtainable and accurate information about the fellowship program.<sup>1,10</sup>

In addition to being able to locate a specific program website, recent studies have explored the importance of more specific details about quality and content of residency program websites, which are similar in use to fellowship program websites.<sup>4,5,7,9</sup> Our study showed that although all fellowship program websites analyzed provided program descriptions, few provided adequate information regarding schedule and curriculum. Besides program description, current faculty information was present on the highest number of websites (90%). It has been reported that a current faculty listing is overall unimportant to prospective residents,<sup>4</sup> although faculty caliber may be more important to fellow applicants. Less than half of fellowship program websites mentioned the rotation schedule (46%), and fewer noted call responsibilities or team coverage. Overall, fellowship program websites were more likely to list information related to recruitment than fellow education, which was consistent with previous research of AOSSM fellowship programs, although this could be owing to the information (ie, faculty listing and application information) being more readily available and consistent over time.

It is possible that those in charge of fellowship programs do not find it necessary to maintain up-to-date information for potential applicants, or that the limited information present on the OTA website is deemed sufficient. The average reported level of importance was 8.5 on a 10-point scale, with no coordinator scoring the importance less than a seven. Furthermore, most respondents (82%) directed those looking for further information about their program to the OTA or fellowship program website. When asked how often their sites were updated, most coordinators estimated yearly, whereas one respondent answered “not often enough.” Based on our data, this perceived importance of the internet, OTA website, and fellowship program websites as adequate resources for fellowship applicants seems incompatible.

There are limitations to the current study. The OTA website was accessed in a month, and the Google searches were performed on a single day. The information or search results obtained may have changed during this time; however, the reported yearly updates for most websites suggests a limited significant effect on results. Additionally, only one search engine was used, which could

affect the variety of results obtained. The items were also only analyzed in terms of presence or absence, without any analysis of quality or detail. Improving on previous research and further validating concerns by Mulcahey et al,<sup>9</sup> we analyzed the top 30 results and found no additional benefit compared to limiting the study to the top 10. Additionally, since initial data was collected, three more trauma fellowships have been accredited, and those are not included in the current study.

Results of the current study showed that the OTA website provides direct links to fellowship information for 14% of accredited programs. As other possible sources of fellowship program details, SF Match and program coordinators mainly defer to the OTA for such information. Fellowship information could be easily obtained for more than 80% of programs using web searches. This would indicate that such information regarding programs and links exist but are not present in an easily accessible central database.

Our study also showed that many accessible fellowship program websites did not provide much information regarding the trauma fellowship, and even fewer provided the information most relevant to applicants. Future studies would benefit from elucidating information most vital to the decision making of fellowship applicants. This information could be used to provide a standard form or template that the programs could either provide on their own websites or that could be reflected on the OTA database. Improvement of accessibility and content of individual fellowship program websites and the OTA database is already viewed as a priority by program coordinators.

Inherent challenges and costs exist associated with maintaining an updated central database that requires information from institutions around the country. However, with the ease of access and communication, it seems feasible and overall beneficial to maintain an information portal. It is a worthwhile endeavor to streamline the application process for potential fellows and more adequately and efficiently dispense vital information to those dependent on such details.

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## Conflict of Interest

The authors report no conflicts of interest.

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