# Comprehensive Evaluation of Primary Care Sports Medicine Fellowship Websites

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**ABSTRACT**

**OBJECTIVE:** To evaluate the comprehensiveness of primary care sports medicine fellowship websites and identify potential areas of improvement.

**DESIGN:** Cross-sectional analysis of fellowship program websites using quantitative and descriptive statistics.

**SETTING:** Internet.

**PARTICIPANTS:** A total of 192 primary care sports medicine fellowship websites listed on the Electronic Residency Application Service (ERAS) website.

**INDEPENDENT VARIABLES:** Program Specialty and Program Region.

**MAIN OUTCOME MEASURES:** The presence or absence of 19 predetermined criteria on primary care sports medicine fellowship websites.

**RESULTS:** The average number of criteria that was included on each website was 9.8 (SD 3.5) (51.6%) of the possible 19. Programs had as few as 2 of the 19 (10.5%) criteria included on their website, and others had as many as 17 of the 19 (89.4%) criteria. Of the 192 primary care sports medicine fellowships, only 5 (2.6%) addressed at least 80% of the 19 different criteria. No primary care sports medicine fellowship website included all 19 criteria.

**CONCLUSIONS:** Most primary care sports medicine fellowship websites do not offer comprehensive information about their programs for prospective applicants.

**KEYWORDS:** Applicant, ERAS, virtual, family medicine, PM&R, education

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## Introduction

In times of transformation at a global scale, we are adapting to a world that is "going virtual" amid a global pandemic.[1-4] As the online realm is our means of communicating, we are learning to find ways to convey our message while minimizing physical interaction. In clinics, physicians are virtually evaluating patients while continuing to provide a high level of medical care.[4] On the educational spectrum, most conferences are switching to a virtual format to accommodate these new precautions. Moreover, program directors and faculty are now facing a new challenge when promoting their programs and selecting candidates for residency and fellowship programs.

At the beginning of an online interview season, both programs and candidates are finding novel ways of projecting their identity in hopes of conveying an accurate depiction of what they have to offer.[1-4] This is a challenge as candidates will now have to rely on information available on program websites as a key tool to make an informed selection to meet their career goals. Therefore, it is of utmost importance that Sports Medicine Fellowship Programs structure their online presence to convey a unique and memorable representation of the comprehensive educational experience they offer. Although websites are one of the most important sources of information for prospective residency and fellowship applicants,[5-7] some studies regarding other specialties have shown that applicants have not found these websites to be optimally useful or user friendly.[8,9] The availability of accessible and essential information is not only beneficial for the applicant, but may also allow the training program to attract more competitive candidates.

Currently, there is a lack of research dedicated to evaluating the information provided by primary care sports medicine fellowship program webpages. Prior studies in other subspecialties have shown insufficient content on residency websites across many programs.[10-12] The purpose of this study is

to analyze the information available in primary care sports medicine fellowship websites to identify potential areas of improvement and determine the need for guidelines to ensure a comprehensive portrayal of each program.

## Methodology

A comprehensive list of primary care sports medicine fellowship programs was obtained from the Electronic Residency Application Service (ERAS) website.[13] All the information reviewed was within the public domain and no human subjects were involved in this research effort. The website of 192 programs participating in the 2021 Sports Medicine match were evaluated for content. Each of the authors examined a subset of the programs, searching for the presence or absence of criteria listed in Table 1. The criteria were selected from prior residency and fellowship website evaluations,[10-12,14-16] as well as qualitative interviews conducted with sports medicine physicians, and with prospective and current sports medicine fellows. Programs were organized into their respective primary specialties of Emergency Medicine, Pediatrics, Family Medicine, and Physical Medicine and Rehabilitation (PM&R). Additionally, they were also divided into United States (US) regions of Northeast, Midwest, South, and West according to designations from the US census bureau.[17]

## Statistical Analyses

Descriptive statistics were calculated using proportions for categorical variables and means and standard deviations for continuous variables. Associations of program location and specialty with website characteristics were estimated using Fisher's exact test. For associations with Fisher's exact test statistic, $<0.05$, logistic regression models were constructed to characterize differences between specific regions. The comparator group was changed in successive models to allow for specific inter-group comparisons. No adjustments were made for multiple comparisons. All analyses were conducted using STATA 15.[18]

## Results

As of September 2020, there were 192 primary care sports medicine fellowship programs on the ERAS, and 185 of them had available websites that were evaluated in this analysis. Of the 192 primary care sports medicine fellowships, only 5 (2.6%) addressed at least 80% of the 19 different criteria. The average number of criteria that was included on each website was 9.8 (SD 3.5) (51.6%) of the possible 19. Programs had as few as 2 of the 19 (10.5%) criteria included on their website, and others had as many as 17 of the 19 (89.4%) criteria. In fact, 67 of the 192 programs (34.9%) had less than 50% of the criteria included in their websites.

Criteria included on at least 80% of the program websites were contact email (88%), link on ERAS (87%), sports coverage information (90.1%), and didactic and curriculum information (81.3%); (Table 1). Criteria included in less than 10% of the program websites were passing rates of the Certificate of Added Qualification in Sports Medicine (CAQSM) examination (4.7%) and number of performed procedures (9%). Analysis focused on primary specialty (Table 2) showed that Emergency Medicine-based programs possessed the highest inclusion rate of the 19 criteria with an average of 12.5 (SD 2.2). In descending order, this was followed by PM&R with an average of 10.1 (SD 3.35), family medicine with an average of 9.7 (SD 3.4), and pediatrics with an average of 9.6 (SD 4.58).

When analyzing program websites based on geographic region (Table 3), it was shown that West-based programs addressed a higher number of criteria with an average of 10.6 (SD 3.4). This was followed by programs from the South with an average of 9.8 (SD 3.3), then Midwest with an average of 9.6 (SD 3.6) and lastly, the Northeast with an average of 9.5 (SD 3.82).

**Table 1.** Number of programs with established criteria.

| CRITERIA | # OF PROGRAMS | PERCENT (%) |
|---|---|---|
| Contact email | 169 | 88 |
| Link in ERAS | 167 | 87 |
| Rotations | 152 | 79 |
| Facilities | 72 | 38 |
| Sports coverage | 173 | 90 |
| Ultrasound curriculum | 81 | 42 |
| Regenerative medicine | 44 | 23 |
| Performed procedures | 17 | 9 |
| Faculty list | 151 | 79 |
| Didactics/curriculum | 156 | 81 |
| Research opportunities | 119 | 62 |
| Salary | 104 | 54 |
| Other benefits | 112 | 58 |
| Activities and social life | 56 | 29 |
| Employment of alumni | 41 | 21 |
| Message from PD | 42 | 22 |
| Number accepted per year | 125 | 65 |
| Selection criteria | 100 | 52 |
| Pass CAQSM | 9 | 5 |

Abbreviations: CAQSM, certificate of added qualification in sports medicine; ERAS, electronic residency application service; PD, program director.

## Discussion

Most primary care sports medicine fellowship websites do not offer comprehensive information about their programs for prospective applicants. To our knowledge, this is the first analysis

**Table 2.** Average criteria met by specialty.

| PROGRAM SPECIALTY | AVERAGE CRITERIA | SD |
|---|---|---|
| Emergency medicine | 12.5 | 2.20 |
| PM&R | 10.1 | 3.35 |
| Family medicine | 9.7 | 3.43 |
| Pediatrics | 9.6 | 4.58 |

Abbreviations: PM&R, physical medicine and rehabilitation; SD, standard deviation.

**Table 3.** Average criteria met by region.

| REGION | AVERAGE CRITERIA | SD |
|---|---|---|
| West | 10.6 | 3.41 |
| South | 9.8 | 3.30 |
| Midwest | 9.6 | 3.62 |
| Northeast | 9.5 | 3.82 |

Abbreviation: SD, standard deviation.

evaluating the comprehensiveness of primary care sports medicine fellowship websites. The average number of criteria that was included on each website was 9.8 (51.6%) of the possible 19. This is similar to a 2020 study analyzing PM&R residency websites which found that of 87 programs, only 12.3 (49%) of the 25 criteria were found on average.[15] Providing easily accessible information may allow applicants to make well informed decisions when applying. Multiple studies have identified the features of program websites that residency applicants find most valuable.[10,14] These components, as well as additional criteria specific to primary care sports medicine fellowships were used to assess the content of primary care sports medicine program websites.[16]

A link on ERAS is the first step to provide useful information in a website. Most programs (87%) had a working link on the ERAS website and a contact email (88%) on the program's site. A complete faculty list showing provider profiles and their specific role in the program can give applicants an idea of potential mentors whom they share interests. More than 75% of the program's websites had a faculty list but only 22% had a message from the program director. Typically, a brief message from a program director helps illustrate the type of culture that a program is based upon. This message may give more information about a program's strengths and weaknesses while outlining the type of applicant the program is seeking.

Sports medicine programs can be based in different primary specialties: emergency medicine, family medicine, pediatrics, and PM&R. Data showed that emergency medicine (12.5) and PM&R (10.1) programs had higher average criteria than family medicine (9.7) based programs. This can be because there are significantly less emergency medicine and PM&R based programs. Having less programs can increase competition between applicants and require the program to have a more comprehensive website.

Sports coverage varies by program and can range from local community sporting events to division I college or professional sports. Most of the websites (90%) had information about their coverage experiences, which is helpful since some applicants are interested in covering higher profile sports, while others are interested in providing care to local communities. This is similar to the data found on the Orthopedic Sports Medicine Fellowship websites study where they also found 90% of the websites had the team coverage duties.[16]

Regarding program region, our data showed western program websites had higher average criteria (10.6) compared to northeastern program websites (9.5). Northeastern programs are geographically closer to each other and some of them may have shared facilities, coverage experiences or social life activities within the same region. These factors may contribute to program similarities and diminish the need to add more criteria to fellowship websites.

Few programs had information regarding the number of procedures performed during fellowship training and exposure to regenerative medicine. Moreover, less than half of the program websites had information regarding their musculoskeletal ultrasound curriculum. Specifically, only 15% of PM&R program websites had information regarding the amount of performed procedures and only 26% provided information about their ultrasound curriculum. As technology advances and the availability of ultrasonography increases, ultrasound-guided procedures and ultrasound based diagnostic evaluations are becoming more popular in musculoskeletal and sports medicine.[19] Ultrasound teaching is also a requirement for every accredited primary care sports medicine program.[20] The same interest applies for regenerative medicine, as orthobiologic treatments are becoming promising nonoperative treatment options.[21]

Surprisingly, 5% of the program websites declared their CAQSM passing rates. This examination certifies a fellow as a board-certified sports medicine physician and applicants may be interested in knowing if the programs prepare you to pass the certification. Also, employment among program alumni is a key factor in deciding which program better suits an applicant's career goals. Only 21% of the websites had information about program graduate job descriptions and locations.

The fellowship and residency application process can be overwhelming and time consuming for both applicants and programs. Optimizing websites can improve the recruitment process for programs and applicants. Program websites serve as cost-effective and widely utilized resources for recruitment, and improving their content can be useful during the application process, especially during times of virtual encounters.[10-12,14-16]

One of the challenges of this study was coming up with a reasonable set of content criteria to appropriately evaluate these fellowship websites. In previous studies, much of the website content criteria were chosen based on other subspecialty studies on residency website quality.[10-12,14-16] Website content that was specifically relevant to a sports medicine fellowship was obtained by interviews with colleagues and learners which makes the criteria selection more subjective. However, the 19 selected criteria encompass a broad range of information that may be of interest to residents applying for a primary care sports medicine fellowship. In addition, this study did not evaluate the ease of navigating websites, which previous studies have described as an important factor for applicants.[5] Some of the criteria information could be found on the institutional website but not on the fellowship website which can make it challenging to the applicant.

This study strictly evaluated the presence or absence of certain criteria and did not assess the accuracy of the information provided by the website. Unfortunately, this information can only be confirmed by the prospective applicant through independent investigation and direct communication with the program faculty during interview day. Another limitation of this study is that it did not take in consideration programs that are not listed in ERAS. Therefore, we do not have a complete data set for all the existing sports medicine programs. Future studies may explore a validated tool that may lead to standardizing primary care sports medicine fellowship website content.

## Conclusions

Currently, these fellowship websites provide only a limited portrayal of what they have to offer. A comprehensive website will allow prospective applicants to make a well-informed selection that closely matches their career goals. These findings may be used by program directors and faculty to optimize websites and further improve residency recruitment.

## Author Contributions

RPR is the first author of the manuscript. MFH and RR-C were responsible for the original research idea and together with RPR and CJ gathered the corresponding data. AC was responsible for the statistical analyses. RPR and CJ drafted the original manuscript together. RR-C and MFH provided intellectual input to the first version of the manuscript and reviewed the entire manuscript with RPR, who submitted the final written version of the main document.

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