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Factors Considered in Ranking Orthopaedic Trauma Fellowship Applicants: A Survey of Program Directors


Kevin P. Sandhu, MD

Natasha M. Simske, BS

Porter Young, MD 

Nathaniel M. Wilson, MD

Lisa K. Cannada, MD 

Paul S. Whiting, MD 

From the Department of Orthopedics and Rehabilitation, University of Wisconsin School of Medicine and Public Health, Madison, WI (Dr. Sandhu, Ms. Simske, Dr. Wilson, Dr. Whiting), and the Department of Orthopaedic Surgery and Rehabilitation, University of Florida College of Medicine—Jacksonville, Jacksonville, FL (Dr. Young, Dr. Cannada).

Correspondence to Dr. Whiting:
psw.hms@gmail.com

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Abstract

Introduction: More than 90% of orthopaedic surgery graduates pursue fellowship training after residency. Previous investigations have examined factors considered important by orthopaedic sports medicine and hand surgery fellowship program directors (PDs). This study sought to identify which factors orthopaedic trauma fellowship PDs deem most important when evaluating applicants.

Methods: A web-based survey was sent to all 59 orthopaedic trauma fellowship PDs. PDs were given a list of 12 factors, which they ranked in order of importance. A weighted score for each factor was calculated. PDs could also write-in additional factors they considered important when ranking applicants.

Results: The overall response rate was 83% (49/59 PDs). Forty-five percent of responding PDs listed the interview as the most important factor when ranking applicants. Other factors considered most important included letters of recommendation, personal connections to the applicant and/or letter writers, and the applicant's background in trauma. Results of the weighted score calculation again identified the interview as the most important factor when ranking applicants, followed by letters of recommendation, personal connections to the applicant/letter writers, the applicant's residency program, strength of the applicant's background in trauma, and research experience.

Discussion: Orthopaedic trauma fellowship PDs consider the interview, letters of recommendation, and personal connections to the applicant/letter writers to be the most important factors when ranking fellowship applicants.

It is well known that orthopaedic surgery is one of the most competitive specialties, with only 70% of resident applicants successfully matching.¹

Many factors are taken into consideration when ranking applicants, including research experience, scores on the US Medical Licensing Examination,

letters of recommendation, and the interview itself.^{2,3} On completing orthopaedic surgery residency, more than 90% of graduates pursue additional training in at least one subspecialty, representing the highest rate of subspecialty training among all surgical specialties.⁴

Orthopaedic trauma is a popular subspecialty, and according to the Orthopaedic Trauma Association (OTA), fellowship match rates have ranged from 72% to 86%⁵ between the years 2010 and 2018. Previous studies have investigated factors that are deemed most important by fellowship program directors (PDs) of orthopaedic sports medicine⁶ and hand surgery⁷ programs, but we could not identify any study to date that has specifically investigated this question among orthopaedic trauma PDs. The purpose of this study, therefore, was to identify the factors orthopaedic trauma fellowship program directors deem most important in evaluating applicants for fellowship training.

Methods

The current study was determined to be exempt by our local institutional review board. We developed a five-question, web-based, anonymous survey designed to identify the factors orthopaedic trauma fellowship PDs consider most important in formulating the rank list of applicants to their programs. The first three questions (multiple choice) aimed to ascertain basic program details including (1) the number of positions available in each fellowship program, (2) the number of applicants interviewed each year, and (3) the number of applicants ranked each year. For the fourth

question, PDs were presented with a list of 12 applicant factors and asked to rank these factors, from 1 to 12, according to their relative importance when considering applicants to their fellowship program. These 12 factors were the same ones used in the study by Baweja et al⁶ (see Supplementary Table 1, <http://links.lww.com/JG9/A95>), and the factors were listed in a random order for each survey recipient. The final question provided PDs with an opportunity to submit, via free text, any additional variables or factors they considered when ranking fellowship applicants.

A complete list of OTA accredited fellowship programs in the United States was obtained from the OTA Fellowship Directory. E-mail addresses for most orthopaedic trauma fellowship PDs were listed in this directory. For the remaining PDs, e-mail addresses were identified using the San Francisco Match website, the American Academy of Orthopaedic Surgeons website, or individual fellowship program websites. An e-mail containing the survey link was sent to all orthopaedic trauma PDs, and two additional reminder e-mails were sent at 2-week intervals. All e-mails were sent by one of the senior authors.

Statistical analysis was done using Microsoft Excel (Microsoft). For question 4, the number of times a given variable was chosen as the “most important” variable was calculated. In addition, a weighted score for each of the 12 factors was calculated according to the methodology of Baweja et al⁶ using the following scale: 5 points for each time a factor was ranked first, 4 points for each second place rank, 3 points for each third place rank, 2 points for

each fourth place rank, and 1 point for each fifth place rank. Cumulative scores were then aggregated for each factor, and the factors were ranked by their weighted scores.

Results

At the time of this study, 59 OTA-accredited orthopaedic trauma fellowship programs were present in the United States, and PD names and e-mail addresses were identified for all of them. Forty-nine of the 59 PDs responded to the survey, for an overall response rate of 83%. All respondents answered each question. Most responding PDs are from programs with either 1 (71.4%) or 2 (14.3%) fellowship positions. Programs most commonly interview 11 to 20 (38.8%) or 21 to 30 (28.6%) applicants for their fellowship positions each year. A wide variation in the number of applicants ranked each year was noted, with the most common response being 11 to 15 (42.9%). A complete summary of PD responses to questions 1 to 3 can be found in Supplementary Table 2 (<http://links.lww.com/JG9/A96>).

Twenty-two of the 49 responding PDs (44.9%) listed the interview as the most important factor in ranking fellowship applicants. As shown in Figure 1, other factors considered most important by PDs included letters of recommendation (ranked first by 22.4% of PDs), personal connections to the applicant and/or letter writers (ranked first by 18.4% of PDs), and the strength of the applicant's background in trauma (ranked first by 8.2% of PDs). The residency program of the applicant, comments made regarding an applicant's technical competence, and the

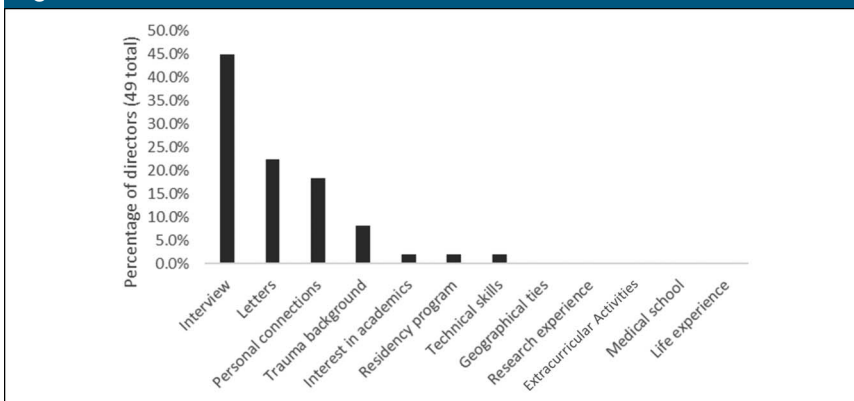
None of the following authors or any immediate family member has received anything of value from or has stock or stock options held in a commercial company or institution related directly or indirectly to the subject of this article: Dr. Sandhu, Ms. Simske, Dr. Young, Dr. Wilson, Dr. Cannada, and Dr. Whiting.

applicant's interest in an academic career were each considered the most important factor by a single responding PD. The other five criteria (an applicant's geographical ties, research experience, extracurricular activities, medical school, or life experiences) were not ranked first by any of the responding PDs.

Results of the weighted score calculation for the 12 factors are shown in Figure 2. Once again, the interview was found to be the most important factor in ranking fellowship candidates (weighted score of 192 points), followed by letters of recommendation (141 points), personal connections to the applicant and/or letter writers (95 points), residency program of the applicant (73 points), and the strength of the applicant's background in trauma (66 points). The least important factors considered when ranking orthopaedic trauma fellowship applicants were the applicant's medical school (6 points), extracurricular activities (14 points), and unusual life experiences of the applicant (23 points).

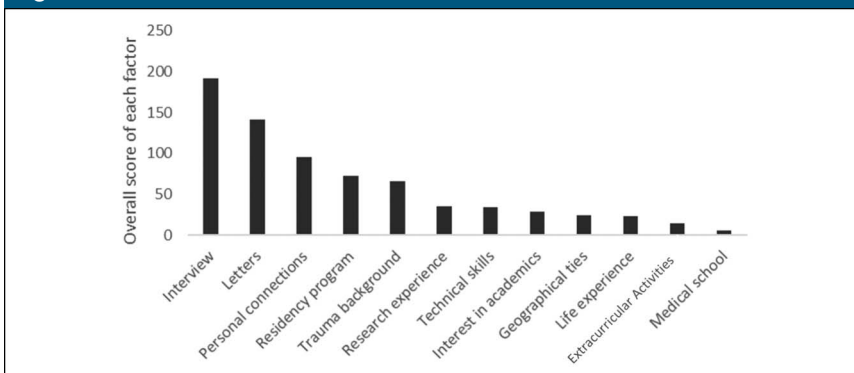
Four PDs provided additional comments in the write-in/free-text section of the survey. These responses included the following: "Applicants should have done their homework, evaluated our program ahead of time, and genuinely have an interest in coming to work with our faculty"; "We really want someone who sees our program as the best fit for their fellowship training"; "It's a feel that they will fit in, humble, down to earth, fire in the belly, a passion to be the best. That is the deal. Then the letters would back it up. They have that, we mold them into our family."; and "Local connections or intent to practice in our area is a disincentive." A common theme identified in three of the four free text comments is that of the perceived "fit" (an intangible quality) of an applicant with a specific fellowship program.

Figure 1



Bar chart demonstrating the factors ranked as most important by orthopaedic trauma fellowship program directors (PDs).

Figure 2



Bar chart demonstrating weighted score for each of the 12 factors, representing their relative importance to orthopaedic trauma fellowship program directors when ranking fellowship applicants.

Discussion

The results of our study indicate that the in-person interview is considered the most important factor by orthopaedic trauma fellowship PDs when evaluating fellowship applicants. This factor was ranked first by almost half of the responding PDs (44.9%), and it also received the highest weighted score among all factors considered (Figure 2). Our results are in keeping with two similar studies of orthopaedic subspecialty fellowship PDs. Baweja et al⁶ demonstrated that the interview was considered the most

important factor by sports medicine PDs when evaluating fellowship applicants (ranked first by 37% of responding PDs). In a similar survey of orthopaedic hand surgery PDs, Nies et al⁷ also identified the interview as one of the most important factors used in ranking fellowship candidates. Although our study did not identify the specific aspects of the in-person interview considered most important to PDs, we presume that the interview allows PDs to get to know applicants in a more personal way. The beginning of the COVID-19 pandemic corresponded with the end of the 2019 to 2020 orthopaedic

trauma fellowship interview season, and some applicants had to complete their interviews virtually. For the 2020 to 2021 interview season, in light of the persistent COVID-19 pandemic, all orthopaedic fellowship interviews will be conducted virtually. The impact of virtual interviews on the fellowship selection process is yet to be determined.

In our study, responding PDs also considered letters of recommendation and personal connections to the applicant and/or applicant's letter writers to be highly important in selecting fellowship applicants. In a survey of orthopaedic subspecialty fellowship PDs, Grabrowski and Walker⁸ reported that letters of recommendation were the most important criterion used in evaluating applicants. Similarly, in a study of aesthetic surgery fellowship PDs, Ergo et al⁹ concluded that the most important factors considered when selecting fellows were letters of recommendation from specialty surgeons, letters from well-known plastic surgeons, optimal interview performance, and a positive interaction with faculty/house staff/residents/fellows as well as interpersonal skills and evidence of professionalism and ethics. Letters of recommendation speak not only to the applicant's aptitude and accomplishments but also to the individual's personal qualities and the applicant's demonstrated performance on a clinical rotation. As such, an applicant's letters of recommendation provide invaluable information about his/her work ethic, dedication, integrity, and leadership potential, criteria that are critically important for orthopaedic trauma surgeons.

Studies of fellowship PDs in other specialties have identified research experience as an important factor to consider when ranking applicants. In a pediatric surgery study, fellowship directors highly valued applicants with notable research experience.¹⁰ In addition, sports

medicine PDs considered a candidate's research productivity to be an extremely important factor.⁵ In our study of orthopaedic trauma PDs, research experience was considered important but not quite as important as the applicant's residency program or the strength of his/her background in orthopaedic trauma.

Orthopaedic subspecialty fellowship training is becoming increasingly competitive. In a study completed by Wera et al¹¹ examining orthopaedic fellowship match trends, the authors reported that the odds of matching at one's first (14% to 41%) or second (8% to 16%) choice for fellowship are overall quite low. As a result, applicants often apply to a greater number of programs to increase their likelihood of matching. This has led to a notable increase in the costs incurred by fellowship candidates during the application process. A study done in 2017 investigating general surgery residency applicants found that individuals spent on average of more than \$4,000 during the interview process.¹² A similar study in gynecologic oncology found that average applicants spent approximately \$6,000. This required approximately 50% of applicants to take on credit card debt to pay for their application expenses.

Our study is the first to investigate this topic among orthopaedic trauma fellowship PDs. Strengths of our study include the very high response rate of 83%, which suggests that our results represent most fellowship PDs. Another strength of our study is the simple survey design, which was used in the recently published study by Baweja et al. Furthermore, we used the same formula to calculate the weighted score, allowing us to differentiate the relative importance of each factor more precisely.

Potential limitations of our study include the theoretical risk of recall bias. This limitation should be mitigated to a large degree by the fact that

our survey was sent out less than 3 months after fellowship match rank lists were due. Therefore, responding PDs should have been able to accurately recall the factors they considered most important when they completed their rank lists. In addition, our study only investigated 12 specific factors, so a chance exists that other important factors were not evaluated. We did, however, provide an opportunity for respondents to write in "other" responses. The only additional theme identified in the write-in comments was that of the perceived "fit" of an applicant with a specific fellowship program. Finally, we did not specifically investigate the particular aspects of the interview or letters of recommendation that are most meaningful to PDs. However, in their extensive questionnaire (65 items), Nies et al⁷ asked PDs to indicate the specific features of the in-person interview that were deemed most important. Responding PDs felt that the interview allowed them to evaluate the applicant's maturity, the ability of the applicant to articulate thoughts and to listen well, the applicant's self-confidence, and relevant questions asked by the applicant. Orthopaedic trauma PDs likely valued the in-person interview for similar reasons.

Conclusion

Our survey of orthopaedic trauma fellowship PDs identified the in-person interview, letters of recommendation, and personal connections to the applicant or letter writers as the three most important factors considered when ranking applicants. These results will be useful for orthopaedic surgery residents and medical students who are interested in pursuing a career in orthopaedic trauma. Understanding the specific factors orthopaedic trauma PDs consider most important will assist applicants to successfully prepare for and navigate the increasingly competitive

orthopaedic trauma fellowship match process.

References

- Schrock JB, Kraeutler MJ, Dayton MR, McCarty EC: A comparison of matched and unmatched orthopaedic surgery residency applicants from 2006 to 2014: Data from the National Resident Matching Program. *J Bone Joint Surg Am* 2017;99:e1.
- Schrock JB, Kraeutler MJ, Dayton MR, McCarty EC: A cross-sectional analysis of minimum USMLE Step 1 and 2 criteria used by orthopaedic surgery residency programs in screening residency applications. *J Am Acad Orthop Surg* 2017; 25:464-468.
- Schenker ML, Baldwin KD, Israelite CL, Levin LS, Mehta S, Ahn J: Selecting the best and brightest: A structured approach to orthopedic resident selection. *J Surg Educ* 2016;73:879-885.
- Hariri S, York SC, O'Connor MI, Parsley BS, McCarthy JC: Career plans of current orthopaedic residents with a focus on sex-based and generational differences. *J Bone Joint Surg Am* 2011;93:e16.
- Orthopaedic Trauma Fellowship Match Report*. Residency and Fellowship Match, SF Match Fellowship and Residency Matching Services. <https://www.sfmatch.org/SpecialtyInsideAll.aspx?id=32&typ=1&name=Trauma&mainSpecialty=Orthopaedics%20&subspec=29#>. Accessed October 28, 2020.
- Baweja R, Kraeutler MJ, Mulcahey MK, McCarty EC: Determining the most important factors involved in ranking orthopaedic sports medicine fellowship applicants. *Orthop J Sports Med* 2017;5: 2325967117736726.
- Nies MS, Bollinger AJ, Cassidy C, Jebson PJ: Factors used by program directors to select hand surgery fellows. *J Hand Surg Am* 2014;39:2285-2288.
- Grabowski G, Walker JW: Orthopaedic fellowship selection criteria: A survey of fellowship directors. *J Bone Joint Surg Am* 2013;95:1-10.
- Egro FM, Saliu OT, Nahai F, Nguyen VT: Aesthetic surgery fellowship selection criteria: A national fellowship director survey. *Aesthet Surg J* 2017;37: 961-966.
- Hirthler MA, Glick PL, Hassett JM et al: Comparative analysis of successful and unsuccessful candidates for the pediatric surgical matching program. *J Pediatr Surg* 1992;27:142-148.
- Wera GD, Eisinger S, Oreluk H, Cannada LK: Trends in the orthopaedic surgery fellowship match 2013 to 2017. *JAAOS Glob Res Rev* 2018;2:e080.
- Watson SL, Hollis RH, Oladeji L, Xu S, Porterfield JR, Ponce BA: The burden of the fellowship interview process on general surgery residents and programs. *J Surg Educ* 2017;74:167-172.