Survival Guide for the Orthopaedic Surgery Match

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Abstract

The process of matching into an orthopaedic surgery residency program can be daunting for medical students. Rumors, innuendo, urban myths, and electronic misinformation can accentuate the angst experienced by students both domestically and internationally. This article dispels myths and presents an up-to-date, evidence-based (where possible), and experience-laden road map to assist medical students interested in pursuing a career in orthopaedic surgery. Our framework takes into account the program selection, test scores, letters of recommendation, visiting rotations, interviews, and communication. We hope that this survival guide will serve as a reference point assisting medical students in achieving successful matches into orthopaedic surgery residency programs.

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J Am Acad Orthop Surg 2017;25: 403-410

DOI: 10.5435/JAAOS-D-17-00196

Applying for residency in orthopaedic surgery is the ultimate game of musical chairs. The number of applicants exceeds the number of positions. Although the process of gaining entry into residency is called "the Match," for many applicants it is better termed "the Hope." The goal of this survival guide is to demystify the orthopaedic surgery match process with the intent of lessening the angst that characterizes this period for many applicants. This guide is not meant to provide step-by-step instructions on how to become an orthopaedic surgery resident. Senior medical students and self-help websites can educate an applicant on the most common do's and don'ts and provide effective timelines with important deadlines. Instead, we provide a framework to help applicants showcase their unique strengths and mitigate weaknesses in their application.

Every student who applies for orthopaedic surgery residency should be cognizant of several factors. First, programs differ considerably from one another on the metrics that an applicant may deem important, such as program size, lecture schedule, surgical volume and experience, research prowess, and geographic climate. Second, programs vary tremendously in the composition of their interview committees and the manner by which interviews are offered. The members of the interview committee can range from the entire orthopaedic faculty, including the research staff, to just a handful of surgical staff members. These disparate interview committee compositions and those committees' individual members are likely to view the exact same application differently. In addition, the formal assessments of applications vary from point systems in which reviewers award applicants specific points for objective achievements documented in an application to systems in which reviewers provide subjective, gut-level assessments of an application as a whole. Some committees also establish a maximum number of candidates to interview from the same school or even

Table 1

Common Metrics in Orthopaedic Surgery Residency Applications[2]

Metric	Mean	SD
USMLE Step 1 score[a]	245.0	12.5
USMLE Step 2 score[a]	250.2	13.4
Number of research experiences[b]	3.5	2.2
Number of abstracts, presentations, and publications[b]	7.7	11.9
Number of volunteer experiences	7.5	4.1

SD = standard deviation, USMLE = United States Medical Licensing Examination
[a] n = 657
[b] n = 666
Adapted with permission from Karnes JM, Mayerson JL, Scharschmidt TJ: Is orthopedics more competitive today than when my attending matched? An analysis of National Resident Matching Program Data for orthopedic PGY1 applicants from 1984 to 2011. *J Surg Educ* 2014;71(4):530-542.

the same state. Lastly, the processes of construction of the final rank list submitted to the National Resident Matching Program (NRMP) vary among programs as widely as the interview processes do.

The application season can be viewed as having two distinct phases. In the first phase, applicants aim to obtain interviews. This phase places a premium on objective characteristics, such as United States Medical Licensing Examination (USMLE) scores, third-year clinical clerkship grades, and membership in the Alpha Omega Alpha medical honor society. The second phase begins with the interview for each program and is much more subjective than the first phase is.[1-3] Although the process may seem to involve substantial randomness and chance, understanding some common features may help applicants maximize their chances of obtaining a successful match.

Background

Each year the NRMP releases descriptive data about the match process for all participating medical specialties and subspecialties.[4] In 2016, 35,476 applicants vied for 27,860 postgraduate year 1 positions and 2,890 postgraduate year 2 positions offered through the match process. At the conclusion of the 2016 match process, only 1,178 positions were unfilled, and 607 of those were postgraduate year 1 positions in preliminary surgery, preliminary medicine, and transitional year programs. Of the unfilled positions, 1,097 were placed in the NRMP's Supplemental Offer and Acceptance Program, in which all but 75 were filled.[3] The match rate for the 18,187 US senior medical students was 93.8%. In orthopaedic surgery, 1,058 applicants (of whom 874 were US senior medical students) vied for 717 positions offered in 163 programs across the country. Of those who successfully matched, 650 were US senior medical students, resulting in a 74% match rate for US senior medical students. No program had any unmatched positions.

The Association of American Medical Colleges' *Report on Residents*, an online collection of current and historic data related to graduate medical education, provides a glimpse into the characteristics of the applicants who successfully matched.[5] Sources of the data include the American Medical Association's Physician Masterfile, the GME Track resident survey database, the Matriculating Student Questionnaire of the Association of American Medical Colleges, and USMLE scores. The most recent data were collected from the graduate class of 2014 and are presented in the December 2016 online version of the report[4] (Table 1). The mean USMLE scores were 245.0 for Step 1 and 250.2 for Step 2, respectively. For USMLE Step 1, a score of 230 marked the 10th percentile of orthopaedic surgery applicants, and a score of 260 marked the 90th percentile. The average orthopaedic surgery applicant produced approximately eight abstracts, presentations, or publications and participated in approximately eight volunteer experiences.

Application Portfolio

Despite the wealth of objective data on applicants' characteristics available for year-to-year comparison, the methods that programs use to determine who is offered an interview and the factors that subsequently influence an applicant's position on the final rank list remain unknown. Every program is unique, and applicants should take care not to make unnecessarily broad generalizations about programs. Unfortunately, no publication of program likes and dislikes or strengths and weaknesses is available to guide applicants in the construction of their application.

The application may be best viewed as a portfolio designed to appeal to the widest number of programs possible. The major parts of the application portfolio are defined by the Electronic Residency Application Service and consist of a complete application, including professional/employment history, hobbies, and scholastic achievements; a curriculum vitae; a medical school transcript; a medical school performance

evaluation (Dean's letter); three letters of recommendation; a personal statement; and the applicant's USMLE transcript. Although there are other components that may hurt or help an applicant, the decision to grant an interview is based primarily on the aforementioned items. More importantly, the applicant assembles his or her portfolio and therefore controls its contents and its presentation. The goal of any applicant should be to construct the strongest possible portfolio. Weaknesses in one area of the application have to be overshadowed by tremendous strengths in others. Applicants should review their complete application portfolio and assess not only the number of potentially weak areas but also the depth of perceived weakness in any one area. Having many areas of deficiency or an insurmountable deficiency in one area does not bode well for an applicant's chances of acceptance. We strongly encourage all students to consult their advisory dean, a faculty member, or another advisor for a candid assessment of their viability as an applicant.

In 2002, Bernstein et al[6] surveyed program directors in orthopaedic surgery to determine the most important factors in the residency applications of senior medical students. Twenty-six potential areas were identified and rated for importance on a 10-point Likert scale, with a score of 10 indicating greatest importance. The most important criteria identified in the survey were performing a rotation at the program director's institution (mean rating, 7.9), USMLE Step 1 score (7.8), and rank in medical school (7.8). The next three most important criteria were encountered in the interview process: formality during the interview (7.6), personal appearance of the candidate (7.4), and performance on ethical questions in the interview (7.1). Furthermore, the authors of the study identified 20 additional areas of at least marginal importance in the orthopaedic surgery application process. In 2011, Egol et al[7] added to the list the number of honors that applicants received in their first two and last two clinical years and meaningful involvement in extracurricular activities.

Although this list is not meant to be exhaustive, applicants may use it as a reference point when evaluating their strengths and weaknesses. A recent review and comparison of matched and unmatched applicants showed that the most important factors in the application packets of US senior medical students who successfully matched were Alpha Omega Alpha membership; graduation from a top-40, National Institutes of Health–funded medical school; the number of contiguous programs ranked; and the USMLE Step 1 score.[1] However, the degree to which each program weighs all of these areas is unknown. Because the United States has 163 orthopaedic surgery residency programs, we can safely assume that the interview selection and rank list construction processes involve myriad different pathways. The choice of programs to which an applicant applies remains completely in the control of the applicant. Despite the tremendous risk of bias and misinformation, word of mouth and social media outlets are the best conduits to determine which characteristics a desired program has historically valued and whether these perceived values align with one's application. Furthermore, alumni from an applicant's institution who are residents in the desired programs are an invaluable resource.

USMLE Scores

Few metrics are likely to cause more angst and concern for both applicants and programs than USMLE scores. The USMLE is given as three separate examinations, but USMLE Step 1 has historically been the determinant of admission into the orthopaedic surgery interview cycle. Although no cutoff USMLE scores have been published for either Step 1 or Step 2, these scores do provide an attractive filter for programs and common sense would suggest that higher scores lead to better chances of securing interview offers. Many authors have confirmed that applicants who successfully match into orthopaedic surgery residencies have USMLE Step 1 scores higher than those of unsuccessful applicants.[1,5-7] No studies have been able to demonstrate, however, that a higher USMLE Step 1 score is a predictor of success for an orthopaedic surgery resident using any performance metric.[8,9] USMLE scores have been favored as a screening tool by orthopaedic surgery program directors because they facilitate an objective, comparable evaluation of the deluge of applications that each program receives. However, the examination was not designed to be a comparative screening tool. One dean of a prominent medical school has even likened its use in this manner to that of off-label use of a drug.[8,10]

Recently, performance on the USMLE Step 2 Clinical Knowledge examination has been suggested to be potentially more predictive of clinical acumen than performance on the USMLE Step 1 examination is.[7,11] This suggestion introduces another variable for senior medical students to consider. Program directors have no hard-and-fast rule dictating the relative weights that they ascribe to USMLE Step 1 scores and USMLE Step 2 scores. Applicants who have performed exceedingly well on the USMLE Step 1 examination have at times been counseled not to take the USMLE Step 2 examination until after the

Table 2

Important Characteristics of Letters of Recommendation[13,a]

Characteristic	Effect on Program Director	
	Usually Affects Impression (%)	Always Affects Impression (%)
Involvement of the letter writer in postgraduate programs	41.5	24.6
Specialty of the letter writer	35.4	35.4
Involvement of the letter writer in selecting residents	49.2	13.8
Duration of the applicant's relationship with the letter writer	47.7	24.6
Nature of the applicant's relationship with the letter writer	44.6	32.3
Reader's familiarity with the letter writer	38.5	50.8

[a] n = 65

Adapted with permission from Marwan Y, Waly F, Algarni N, Addar A, Saran N, Snell L: The role of letters of recommendation in the selection process of surgical residents in Canada: A national survey of program directors. *J Surg Educ* 2017; January 23 [Epub ahead of print].

admission season has concluded. However, in the presence of a highly competitive applicant pool, it may be necessary to reassess this logic. Indeed, in our programs we have anecdotally noted a trend toward even the strongest applicants' having completed both examinations with a reportable score before the start of the admission season.[12] For example, during the 2016 application season at the NewYork-Presbyterian/Columbia University Irving Medical Center, 41 of the 52 students (79%) applying into orthopaedic surgery completed Step 2 and included their score in their application packet. Twenty-six of the 41 students (63%) who completed Step 2 actually scored higher on Step 2 than they had on Step 1. In addition, USMLE Step 2 presents an opportunity for redemption to applicants who think that their USMLE Step 1 score is not competitive.

Letters of Recommendation

We counsel our students to select the recommendation writers who can best advocate on their behalf. Although the selection of the letter writers is within the applicant's control, the content of the letter is not. Similarly, the skill of the letter writer is often unknown to the applicant. Therefore, it is possible for an exemplary applicant to be disadvantaged by the style of the letter writer. In the survey conducted by Bernstein et al,[6] the discrepancy in relative importance of the letters of recommendation in the eyes of programs and applicants was striking. In the list of 26 application items, recommendation letters ranked as the most important part of an application packet from the applicants' perspective but a distant seventh on the program directors' list.[5]

Despite the average senior medical student's subjective assessment of the importance of recommendation letters, few program directors can objectively state that the quality of the recommendation is an important criterion for acceptance.[5,9] A recent survey of surgical program directors sheds some light on the shortcomings of letters of recommendation.[13] Specifically, 83% of the program directors who responded to the survey had never received any formal instruction on how to write a letter and are therefore at a disadvantage when writing letters or assessing the recommendation letters written by others. The percentage of all available letter writers and reviewers who have received formal instruction in writing recommendations is unknown. The resulting heterogeneity in the letter-writing process can be detrimental to applicants who, through no fault of their own, have chosen their recommendation writers unwisely.

A recent article by Marwan et al[13] presents some useful guidelines to govern an applicant's selection of letter writers (Table 2). The authors note that influential characteristics of the letter or the letter writer included involvement of the writer in postgraduate education, the writer's specialty, the writer's stated or inferred involvement in the residency selection process at his or her institution, and the duration and nature of the relationship between the applicant and the letter writer. The most influential characteristic was the letter reader's familiarity with the writer of the letter. This factor guides many applicants to request letters from the more well-known orthopaedic surgeons in any given department. The assumptions underlying this common practice are that a well-known orthopaedic surgeon knows how to write a good letter of recommendation and that the well-known surgeon can write a meaningful letter suggesting more than a cursory familiarity with the applicant. These assumptions may not be accurate. Therefore, the most influential letters of recommendation may actually come from academic orthopaedic surgeons with some type of a professorial rank or title who have known a given applicant for longer than a 2-week

rotation. Having a letter written by a surgeon of high national prominence would offer a strong advantage, but if an applicant has to choose between an assistant professor who has known the applicant for 2 years in an advisory capacity and a nationally recognized surgeon who has had 2 weeks of interaction with the applicant, the applicant might be better served with a letter from the former. In addition, having all of the recommendation writers be orthopaedic surgeons is certainly advantageous but not mandatory.

A unique situation may exist for applicants who hail from medical schools that do not have an associated academic orthopaedic department. In this scenario, letters of recommendation that speak to the duration and the nature of the interactions between the applicant and the letter writer become much more important. Although readers outside of the particular region may not know the writer or the writer's reputation, a warm and thoughtful letter that speaks to an applicant's work ethic, interpersonal skills, and teamwork can be extremely helpful to the applicant. In addition, the letters of recommendation secured after a visiting rotation become much more important for applicants in this scenario.

Away Rotations

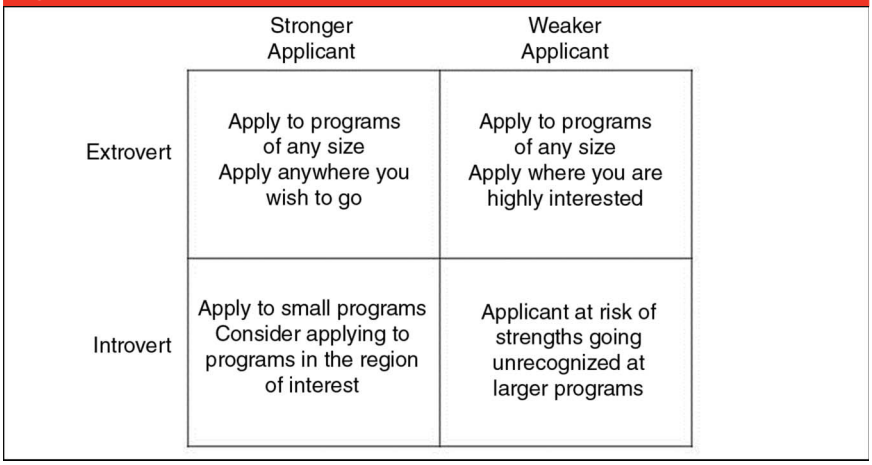
Arguably, visiting orthopaedic surgery rotations (also called externships, subinternships, or away rotations) may be the most important aspect of the application process.[5,10,14] They allow the student to audition for a position in order to strengthen their application, assess the professional and personal environment of a potential training location, obtain a valuable letter of recommendation from a physician in a program other than the student's home program, and potentially improve their orthopaedic education.[7] The benefit to the program is that the rotator essentially performs a 4-week–long interview. Compared with the standard interview process in which 20 to 30 applicants are interviewed over the span of a half day, the month-long interview clearly has pros and cons. With this prolonged and intimate exposure, a program can potentially evaluate an applicant for shortcomings in the affective domain, assess the applicant's fit with the program environment, and perform tests of grit and aptitude without the time constraints of the conventional interview day. Indeed, some program directors think that the rotation is the biggest determinant of the strength of an application.[5] Two major questions posed by medical students interested in orthopaedic surgery are how many away rotations are optimal and where they should be done.

Baldwin et al[14] examined several aspects of the applications of successfully matched applicants and compared them with the applications of a much smaller cohort of unsuccessful applicants. One finding was that the chances of matching were highest for students who performed two away rotations and decreased for those performing three or more away rotations. The authors noted that the former group had higher USMLE Step 1 scores and a higher percentage of applicants inducted into the Alpha Omega Alpha honor society than the latter group had. They concluded that greater numbers of away rotations were done by applicants who had weaker application packets.[14] Although this study provides some guidelines for applicants assessing how many away rotations to perform, the findings are dated and may not be applicable to today. Our anecdotal observation is that many more students are now doing three away rotations. Changes in medical school curricula, lessening of restrictions, and applicants' fears of not matching have all contributed to this rise over the last several years.

In a more recent study, O'Donnell et al[10] reported that applicants and program directors both thought that performing an away rotation added very little to an applicant's overall competitiveness but remained valuable to the program in question. In their survey, only 14% of program directors thought that away rotations done at institutions other than their own made an applicant more appealing. If both home institution rotations and visiting rotations are included, nearly 60% of their surveyed 524 applicants performed a rotation at the program into which they eventually matched for residency. This finding suggests that the total number of away rotations is less important than the locations where the rotations are conducted.

For both the student and the program, the primary goal of an away rotation may be to make a good impression.[14] Anecdotally, from a student's perspective, making a good impression requires performing a critical examination of one's own strengths and weaknesses before applying for a visiting rotation and then matching that profile to the environment of the prospective rotation. One way to accomplish this is to consider the size and the desirability of the programs. The type of institution (academic versus community) and the regions of the country that hold appeal for the applicant should be factored into the desirability of a program and can help to guide the number of away rotations an applicant should perform. A program's desirability is therefore a personal metric and largely the product of an applicant's research into potential programs. In contrast, the size of a program affects the chances of a visiting medical student's being perceived as a good fit

Figure 1



Away rotation selection matrix demonstrating the different concerns of extroverts and introverts in the orthopaedic surgery residency match process.

by the myriad evaluators who will be surveyed at the end of any student's visit.

Before the rotation application season begins in earnest, applicants need to candidly reflect on their personality and consider whether they are an introvert or an extrovert. Introverts and extroverts should think about away rotations differently. Introverts in large programs are at risk of being quickly forgotten among the presence of many and often much more dominant personalities. Larger programs (ie, six or more residents per year) will tend to have greater numbers of visiting rotators overall and at any one time, compared with smaller programs (ie, four or fewer residents per year). In this setting, introverts have a substantial risk of being disadvantaged by recall bias because extroverts are likely to be more memorable to potential evaluators. Introverted students would be much better served at smaller and more intimate programs that allow for greater focus on any given rotator at one time. In contrast, extroverts have their pick of locations because they have the ability to fit in nearly everywhere. They should use their gregarious personalities as an additional strength to overcome possible weaknesses in their application to a desired program or simply as another positive aspect of an already stellar application (Figure 1). Although extroverts have to balance their outgoing personality against the appearance of being too comfortable or overconfident, a strong applicant who is an extrovert will likely be highly sought by many programs at which the applicant might rotate. In contrast, weaker applicants who are extroverted should strongly consider rotating at programs of high interest and desirability because a strong performance can overcome many potential shortcomings in an application packet. If an applicant needs help in determining his or her personality type, there are a number of online sites and questionnaires that might help to frame this important distinction.

Interview Day

The interview day with the commonplace preinterview social event is critically important to obtain a successful match with an orthopaedic residency program. The faculty and residents in a program form strong and lasting impressions of applicants based on their behavior in social and professional situations. Although the interview day may be an intimidating process, it is also an opportunity for applicants to explore programs to find the best fit for their preferences. The interview day and preinterview social event are optimal arenas for applicants to gather information about programs from multiple sources and to share perspectives on programs with other applicants. Applicants commonly perceive that the programs hold most of the power to select and match residents, but applicants hold equal power to ascertain the strengths and weakness of programs and to rank the programs in a way that best reflects their personal preferences. Applicants sometimes find it difficult to shift to this perspective in their thinking, but doing so often helps them stand out as being in touch with their preferences for residency program qualities.

A preinterview social event is commonly held the night before an interview day. This social event is typically attended by applicants and residents, with or without faculty present. The social event is an opportunity for applicants to meet the residents, observe the social dynamics of the residency program, and form impressions of the values of the residents and the program. The social event should be considered an informal interview. Poor behavior by applicants will likely negatively affect their ranking because many programs have residents participate in the ranking discussion sessions.

On the interview day, applicants should adhere to the basic principles of a professional interview: dress professionally, arrive on time and preferably early, behave professionally at all times, stay positive, and focus on strengths rather than

faults or weaknesses. It is important to be courteous and respectful to all people encountered during the interview day, including receptionists, administrative staff, other interviewing medical students, residents, and, of course, faculty. Being disrespectful to anyone in connection with the interview process may have negative effects. The so-called downtime spent mingling with residents between the interviews is sometimes as critical as the interviews themselves, especially for nonrotator applicants.

Appearing knowledgeable about the program in the interview is important. Preparation includes researching facts about the residency program, including the clinical strengths; the mission of the program; the research capabilities and interests of the faculty; the educational and curricular strengths of the program; and information about the department chair, program director, and chief residents. This background research helps the applicant have meaningful conversations during the interview day. It also enables the applicant to judge and compare the programs on the qualities that are most important to the applicant. It is helpful for the applicant to write down each program's qualities in a matrix or on a list during the interview season. The applicant can use this list to compare program qualities relative to personal preferences when ranking the desired programs.

Interviews are typically held during a half-day session, with some programs holding multiple sessions to accommodate a higher number of applicants. Typically, four to six interviews of 8 to 30 minutes in length are conducted, with most interviews lasting 10 to 15 minutes. Interview themes vary among programs, but many programs use a conversational method that involves discussion of personal, educational, and research-related aspirations, achievements, and goals. Many programs also employ an ethics assessment interview, an orthopaedic knowledge assessment, and possibly an assessment of surgical skills or manual dexterity. A recent study of the orthopaedic interview process found that approximately 22% of programs used an ethics assessment, 20% used an orthopaedic knowledge assessment, and 12% used a skill or dexterity assessment.[15] Thirty-two percent of applicants thought that a skill assessment should be part of the interview process. Applicants thought that the ideal number of interviews during an interview day was five and that two interviewers should be present at each interview experience.

Communication

We live in a digital world, and the ease with which applicants and programs can communicate with one another is much greater now than in prior generations. With standardized applications, standardized interview days, and a rank list submission process that is essentially standardized, correspondence may be the only part of the process that an applicant can personalize. Communication can be broken down into early communication and late communication, with an applicant's interview serving as the reference point.

No guidelines for preinterview communication have been published. In the absence of formal guidelines, common sense prevails. Preinterview communications can be akin to the cover letters common in the nonmedical professional space.[16] Cover letters can open and close doors depending on their content and timing. Although cover letters are rarely used in medical education, correspondence that is brief, thoughtful, and personal may have a place in the residency application cycle. Orthopaedic surgery residency programs receive approximately 120 to 200 applications per available position. Most programs offer 8 to 15 interviews per position. The interviews are conducted in a highly scripted manner over a short time, and this process often does not lend itself to change. If a program does not extend an invitation for an interview, contacting the program after the fact is rarely effective because many programs do not have the flexibility to add an applicant to their interview schedules. The flexibility exists before the schedules are set.

Applicants who enter the match process as couples represent a unique cohort for whom preinterview communication can be extremely influential. If an applicant is offered an interview with an orthopaedic surgery program, it can be advantageous to communicate with the program that the other member of the couple is applying to the same institution in another field. It is not uncommon for the partner to be granted an interview after this type of communication. Likewise, we have granted interviews to applicants in orthopaedic surgery after being contacted by a representative of the department to which the applicant's partner is applying.

In contrast to preinterview communication, postinterview communication does have formal guidelines. The NRMP has a Match Communication Code of Conduct that was created in conjunction with the Council of Medical Specialty Societies Organization of Program Director Associations.[17] This code was created to guide programs and staff involved in the match process, and program directors are asked to commit to its tenets. Importantly, the Code of Conduct urges program directors to respect the logistical and financial burden many applicants face and not to require second-look visits or imply that such visits

would potentially affect placement of an applicant on a rank order list. Additionally, it discourages unnecessary postinterview communication. Program directors should neither solicit nor require postinterview communication from applicants and should never engage in any communication intended to influence applicants' ranking preferences. The NRMP does not expressly forbid all communication, but it does forbid coercive communication. In a recent survey of a small subset of the applicant pools from the 2014 and 2015 interview seasons, Brooks et al[18] discovered that 64% of the applicants had received some form of postinterview communication, although the authors did not note the form of the communication or the initiating party. Nevertheless, 20% of applicants reported experiencing pressure to reveal where a program stood on their list, 17% were encouraged to perform a second-look visit, and 8% were asked to rank a program first in exchange for the program extending the same courtesy. Ultimately, however, 90% of applicants said that communication from a program did not change how they ranked the program with which they eventually matched.

Program representatives should never initiate communication with an applicant beyond simple pleasantries, nor should they respond in any way that implies a quid pro quo to an applicant's statements or actions. To mitigate any perceptions of impropriety, we strongly advise that no communication should occur between applicants and program faculty, program directors, or program chairs after the interview process. Applicants, however, should have the latitude to communicate with residents in their pursuit of making the best decision for their ultimate rank list and should do so in a transparent and truthful manner that maximizes their application and conveys a sincere interest if it exists.

Summary

Navigating the orthopaedic surgery match process can be daunting. This survival guide provides a road map intended to maximize the student's potential to achieve a successful match. The process involves many variables, including program selection, test scores, letters of recommendation, visiting rotations, interviews, and correspondence. We hope that the guidelines outlined in this article will make the process slightly less nerve-wracking for future applicants.

References

References printed in **bold type** are those published within the past 5 years.

1. **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(1):e1.**
2. **Karnes JM, Mayerson JL, Scharschmidt TJ: Is orthopedics more competitive today than when my attending matched? An analysis of Resident Matching Program Data for orthopedic PGY1 applicants from 1984 to 2011. *J Surg Educ* 2014;71(4):530-542.**
3. **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(5):879-885.**
4. National Resident Matching Program: Results and Data: 2016 Main Residency Match®. http://www.nrmp.org/wp-content/uploads/2016/04/Main-Match-Results-and-Data-2016.pdf. Accessed February 6, 2017.
5. Association of American Medical Colleges: Report on Residents. https://www.aamc.org/data/448474/residentsreport.html. Accessed February 6, 2017.
6. Bernstein AD, Jazrawi LM, Elbeshbeshy B, Della Valle CJ, Zuckerman JD: An analysis of orthopaedic residency selection criteria. *Bull Hosp Jt Dis* 2002-2003;61(1-2):49-57.
7. Egol KA, Collins J, Zuckerman JD: Success in orthopaedic training: Resident selection and predictors of quality performance. *J Am Acad Orthop Surg* 2011;19(2):72-80.
8. **Prober CG, Kolars JC, First LR, Melnick DE: A plea to reassess the role of United States Medical Licensing Examination Step 1 scores in residency selection. *Acad Med* 2016;91(1):12-15.**
9. **Bernstein J: Not the last word: Ending the residency application arms race. Starting with the USMLE. *Clin Orthop Relat Res* 2016;474(12):2571-2576.**
10. **O'Donnell SW, Drolet BC, Brower JP, LaPorte D, Eberson CP: Orthopaedic surgery residency: Perspectives of applicants and program directors on medical student away rotations. *J Am Acad Orthop Surg* 2017;25(1):61-68.**
11. **Raman T, Alrabaa RG, Sood A, Maloof P, Benevenia J, Berberian W: Does residency selection criteria predict performance in orthopaedic surgery residency? *Clin Orthop Relat Res* 2016;474(4):908-914.**
12. Javidi L: *Does USMLE Step 2 CK Matter If I Aced Step 1?* April 27, 2016. https://www.medschooltutors.com/blog/does-step-2-ck-matter-if-i-aced-step-1. Accessed February 13, 2017.
13. **Marwan Y, Waly F, Algarni N, Addar A, Saran N, Snell L: The role of letters of recommendation in the selection process of surgical residents in Canada: A national survey of program directors. *J Surg Educ* 2017; January 23 [Epub ahead of print].**
14. Baldwin K, Weidner Z, Ahn J, Mehta S: Are away rotations critical for a successful match in orthopaedic surgery? *Clin Orthop Relat Res* 2009;467(12):3340-3345.
15. **Camp CL, Sousa PL, Hanssen AD, et al: Orthopedic surgery applicants: What they want in an interview and how they are influenced by post-interview contact. *J Surg Educ* 2016;73(4):709-714.**
16. Gallo A: How to write a cover letter. *Harvard Business Review*. February 4, 2014. https://hbr.org/2014/02/how-to-write-a-cover-letter. Accessed March 17, 2017.
17. National Resident Matching Program: *Match Communication Code of Conduct*. http://www.nrmp.org/code-of-conduct/. Accessed March 17, 2017.
18. **Brooks JT, Reidler JS, Jain A, LaPorte DM, Sterling RS: Post-interview communication during application to orthopaedic surgery residency programs. *J Bone Joint Surg Am* 2016;98(19):e84.**