Viewpoint From a Former Medical Student/Now Intern Playing the Game—Balancing Numbers and Intangibles in the Orthopedic Surgery Match

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What is the application experience for medical students?

The process of applying for residency in a highly competitive field, such as orthopedic surgery, is an exciting but daunting task for students in their fourth year of medical school. In addition to completing all of their graduation requirements, students must also apply for and attend 1 to 4 away rotations at institutions where they hope to secure a residency position. Although these rotations are not strictly required, they have become increasingly necessary to help students stand out to interviewers from an ever-larger sea of highly qualified applicants.

Students must arrange for lodging and then travel to their away rotations, where they typically complete month-long rotations while working alongside residents and attendings. These experiences help to determine, for the program and the student, whether the candidate is a good fit. After these rotations, students complete and submit Electronic Residency Application Service applications and wait several weeks for interview offers.

In 2014, there were 994 applicants for 695 orthopedic surgery positions, for a final match rate of 77% among US graduates.¹ According to post-Match surveys conducted by the National Resident Matching Program (NRMP), US seniors applied to an average of 70 programs; each program received an average of 549 applications, but on average, offered only 5 positions.¹ In orthopedic surgery, students rank an average of 12 programs,¹ which requires traveling all over the country to interviews for 2 to 3 months beginning in November. When the interviews have been completed, applicants then enter the anxious waiting period before Match Day when they will find out where they will live, work, and learn for the next 5 years.

Why are medical students applying to an increasing number of residency programs?

At nearly every interview, someone comments about the increasing number of applications and mentions

that every year orthopedic surgery is becoming increasingly competitive. In reviewing NRMP data from 1984 to 2014, Karnes et al² found that the number of orthopedic surgery positions per applicant had increased over time, though the percentage of unmatched applicants was unchanged since 1984. The authors concluded that the Match process for orthopedic surgery was no more competitive in 2014 than it was in 1984. However, they also noted a mean 31% increase (from 47.3% in 2007 to 62% in 2012) in the number of applications submitted by each applicant over the 5-year period between 2007 and 2012. They hypothesized that this increase forced programs to place more emphasis on quantifiable, objective applicant characteristics, such as United States Medical Licensing Examination (USMLE) Step 1 scores and Alpha Omega Alpha (AOA) honors, an academic honors society for medical students.

The causes of this “application creep” are not clear. It may be related to the relative ease of applying to programs via web-based applications rather than multiple paper-based applications. Also, it is common knowledge among medical students that the average number of submitted applications is 70; thus, many view applying to fewer programs as risky. In game theory, this is known as a *Nash equilibrium*, in which each player knows the equilibrium behavior of all other players and has nothing to gain by changing his or her own strategy.³ If applicants attempt to reduce the large application pool faced by program directors, they must decrease their own chance of being noticed by a program by removing their application from the pool. Hence, the only way to solve the problem of a massive application pool is for all applicants, either voluntarily or through regulation, to lower the number of programs in which they can apply.

Why are medical students applying to many programs that are a “reach” for specialty or site, given their medical school records?

Should the medical schools provide advice?

There are 2 likely answers to these questions. First, although there is a minute chance that a given applicant will match into a given program, from the

applicant's standpoint this percentage is actually a 0 or 1; either the student has an application submitted for the program to consider, which gives him or her some theoretical chance of matching, or the student does not, which results in a 0 chance of matching at that program. Therefore, applicants apply to programs that are considered a reach because they see more value in having a small chance at a position versus no chance at all.

Second, it is difficult for applicants to accurately assess the competitiveness of a given program or specialty. Unlike the medical school application process, programs usually do not provide information regarding the qualifications of students who have matched there. As a result, information about a program's competitiveness is often gained through advisers or other students. The anecdotal nature of this information makes it unreliable in assessing one's competitiveness. One helpful source of information is *Charting Outcomes in the Match*, a publication released every 2 years by the NRMP.¹ It plots information, such as average USMLE scores, AOA status, and number of work experiences, to provide an applicant's probability of matching. However, each year there are very highly qualified students who do not match and students with very low scores who nonetheless secure a position. These outliers likely contribute to a perception that an applicant may have a chance anywhere, despite a low performance in some areas.

Should the NRMP—or another group—place a limit on how many programs medical students can apply to or how many interviews they can attend?

An obvious solution to the problem of applicants applying to an excessive number of programs is perhaps to limit the number of applications per student. This would allow students to apply to programs of greatest interest and provide programs with a smaller pool of applicants. The challenge in implementing this change would be to determine an appropriate upper limit for applications. If the number is too small, then students would not fully explore the options available, and if the number is too large, the problem will not be addressed. Strategies to discourage applications, such as charging a fee for applications past a certain limit, are not likely to be effective; fourth-year medical students have already paid substantial sums of money for medical school tuition and may view this expense as simply another investment in their future. For this reason, the most effective strategy is to place a cap at a fixed number of applications allowed for each applicant.

Should medical schools advise applicants to apply to a backup specialty, through the Match, if they are applying to a highly competitive first-choice specialty?

In 2014, the mean number of specialties ranked by matched orthopedic surgery applicants was 1.1 compared with 1.4 for unmatched applicants,¹ which suggests that few applicants pursue this strategy. In all specialties, programs seek incoming residents who are highly committed to their chosen field; applying to a backup specialty may indicate to a program that the resident is not fully committed to the discipline, even if this is not the case. Therefore, most applicants to highly competitive specialties avoid applying to backup specialties to deter any speculation regarding their absolute commitment to the specialty.

When faced with huge numbers of applicants, how can program directors approach each applicant in a holistic way and avoid using cutoffs, such as USMLE score, class rank, or type of medical school?

Away rotations during the fourth year of medical school have become a semimandatory component of the residency application process for competitive specialties. Although such rotations require significant time and financial investment from programs and applicants, they serve as a critical time during which both parties may gather information regarding an applicant's fit within a program. While fit is difficult to quantify, it is often the factor that separates an applicant from a large field of otherwise equally highly qualified individuals.⁴ By placing increased emphasis on applicants who have completed an away rotation at their program, program directors can identify potential candidates rather than using arbitrary cutoffs such as class rank, USMLE scores, and AOA status, which may not necessarily predict success in a surgical specialty. Certain programs now also request a dedicated personal statement describing specific reasons why an applicant is interested in the program before an application will even be considered. Both of these methods allow programs to look at an applicant in a more holistic way and determine whether he or she might be a good fit.

How can the current application and interview process be improved?

Although the modern Match process has solved many problems for medical students and training programs, it has also created unintended problems. These include programs being inundated with massive

numbers of applications and having insufficient means to differentiate a pool of highly competitive applicants. To more finely tune the selection process, a limit should be placed on the number of applications that individuals may submit. Moreover, programs should place stronger emphasis on the importance of away rotations and dedicated personal statements in order to view applicants in a more holistic way and, thus, select an optimal group of incoming residents.

References

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