

Away Rotations and Matching in Integrated Plastic Surgery Residency: Applicant and Program Director Perspectives

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Background: Although nearly all medical students pursuing integrated plastic surgery residency participate in elective rotations away from their home medical school, the value and costs of these “away” rotations have not been well studied.

Methods: The authors surveyed all integrated plastic surgery program directors and all applicants in the 2015 National Residency Matching Program.

Results: Forty-two program directors and 149 applicants (64 percent and 70 percent response rate, respectively) completed the survey. Applicants reported 13.7 weeks spent on plastic surgery rotations during medical school, including a mean of 9.2 weeks on away rotations. Average reported cost for away rotations was \$3591 per applicant. Both applicants and program directors most commonly reported “making a good impression” (44.6 percent and 36.6 percent, respectively) or finding a “good-fit” program (27.7 percent and 48.8 percent, respectively) as the primary goal for away rotations. Almost all applicants (91.1 percent) believed an away rotation made them more competitive for matching to a program at which they rotated. Program directors ranked a strong away rotation performance as the most important residency selection criterion. Twenty-seven percent of postgraduate year-1 positions were filled by an away rotator and an additional 17 percent were filled by a home medical student.

Conclusions: Away rotations appear to be mutually beneficial for applicants and programs in helping to establish a good fit between students and training programs through an extended interaction with the students, residents, and faculty. In addition, making a good impression on a senior elective rotation (home or away) may improve an applicant’s chance of matching to a residency program. (*Plast. Reconstr. Surg.* 137: 1337, 2016.)

Integrated plastic surgery residency is among the most competitive categorical specialties to match in all of surgery or medicine. Based on 2014 National Residency Match Program data, only neurological surgery had more applicants per position (1.54) than integrated plastic surgery

(1.52), and the successful match rate by U.S. seniors was lower in plastic surgery (70.8 percent) than in any other specialty. Among all U.S. seniors, plastic surgery applicants had the most research experience and the highest mean number of abstracts, presentations and publications.¹

To select their incoming interns, program directors must review hundreds of these top applicants annually. Beyond the impressive statistics for these students, program directors must often make selection decisions with limited personal contact with applicants. Accordingly, selection of candidates for interviews, and subsequently ranking them for the Match, can be challenging.²

Given the competitive nature of the application process, students may look for any competitive edge when applying for residency. Not

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surprisingly, there may be an advantage to applicants who are better known to a program and thought to be a “good fit.” Several avenues exist for applicants and programs to learn more about each other, and to determine whether they would be a good match. First, there are medical students at the home medical schools of integrated plastic surgery programs. However, of the 141 accredited-allopathic medical schools, only 59 have affiliated integrated plastic surgery residencies.³ Therefore, as a second avenue, many students choose to spend one or more rotations as a visiting student participating in “away rotations” at programs outside their home medical school.

Even students with affiliated home residency programs often choose to participate in such away rotations. Previous studies in orthopedics, general surgery, and dermatology have demonstrated a number of potential reasons for students to participate in away rotations (e.g., identifying good-fit programs, obtaining letters of recommendation, and so on), but this has not been studied for plastic surgery.⁴⁻⁷ We sought to obtain the perceptions of applicants and program directors to evaluate the goals and objectives and the perceived value and costs of away rotations.

METHODS

We developed two survey constructs—one for applicants and one for program directors—through literature review and focus group discussions with applicants, residents, and program directors.^{8,9} We created questions to assess the frequency, goals, and objectives for away rotations, and the perceived value and costs of these experiences.^{10,11} After obtaining institutional review board approval, we piloted our survey with students, current residents, and program directors. During piloting, the survey was iteratively revised to improve content, clarity, and response process validity to the study construct.⁹ A reliability analysis showed excellent correlation between concordant variables (Cronbach alpha, 0.83) during the survey development phase.

Applicants

Between October and November of 2014, we distributed our anonymous, electronic survey through e-mails gathered from the Electronic Residency Application Service. To sample all students in the 2014 to 2015 application cycle, we requested that 10 different residency programs distribute the survey to their entire applicant pool. Electronic Residency Application Service

data (corroborated by results of this study) demonstrate that applicants to integrated plastic surgery residency submit their applications to most programs (the average number of applications per person in 2015 was 52.5). Based on probability distribution, we determined with high statistical confidence (99.9 percent) that this method would include all applicants in the 2014 to 2015 cycle.

Program Directors

Electronic requests for participation were sent to program directors using the American Council of Academic Plastic Surgeons e-mailing list. A personalized follow-up e-mail to each program director was sent 3 weeks after the initial request to improve response rate. The survey was administered between November and December of 2014.

Program Data

To obtain data regarding away rotations completed by current plastic surgery residents, we distributed a questionnaire to residency program coordinators. Electronic requests were sent to all program coordinators at integrated residency programs; data collection occurred between January and February of 2015.

Statistical Analysis

Descriptive and inferential statistics were performed using Microsoft Excel (Microsoft Corp., Redmond, Wash.). Rating scores for individual responses were assigned interval values (1 through 5) so that weighted averages could be generated to compare the responses within questions. Student's *t* test was used to identify significance between groups.

RESULTS

A total of 149 responses were obtained from 213 applicants (70.0 percent response rate). The mean age of respondents was 26.9 years, and the majority were men (64.6 percent). These results compare appropriately to the mean age of plastic surgery residents (28.6) and proportion of men (58.6 percent) in all years of training (postgraduate years 1 through 6) reported by the Accreditation Council for Graduate Medical Education.³ The average United States Medical Licensing Examination Step 1 score was 242.2 ± 16.5 , which is equivalent to the mean score (242) reported by the National Residency Matching Program in the 2013 to 2014 application cycle.¹ The average reported cost for all away rotations (e.g., travel, lodging, fees) was \$3591.

From the program director survey, 42 responses were obtained (64 percent response rate). The respondents reported a wide range of experience (1 to 15+ years) in their role as program director and led programs of varying sizes in all geographic regions.

Frequency

Nearly all applicants (87.9 percent) reported participating in a fourth-year subinternship or senior elective rotation at their home medical school. On average, applicants reported 13.7 weeks spent on plastic surgery rotations during medical school, including a mean of 9.2 weeks on away rotations (mean $\pm$ SD, 2.3 ± 1.2 away rotations). Most commonly, applicants reported completing two or three away rotations (36.2 percent and 29.5 percent, respectively); only nine respondents (6.0 percent) did not complete any away rotations.

The majority of applicants (60.4 percent) reported that program directors expect students to complete two away rotations. When applicants were asked the maximum number of away rotations a student “should be allowed” to complete, the mean response was 3.51 [mode, 3 (32.9 percent)]. Most applicants (61.9 percent) reported they would complete the same number of away rotations if they had to go through the process again. However, a majority (53.7 percent) would have chosen

different institutions for these rotations. Nevertheless, 91.1 percent of respondents believed that their away rotations made them more competitive for the programs at which they rotated.

We also asked applicants to gauge their competitiveness for matching into plastic surgery. The histogram of responses (Fig. 1) demonstrates a shifted but nearly normal distribution centered between moderate and strong. We did not find any significant differences in the frequency of away rotations among those applicants with higher or lower self-reported competitiveness. Similarly, there was no difference in the frequency of away rotations based on United States Medical Licensing Examination Step 1 scores. Students at medical schools without affiliated integrated residency programs reported completing more away rotations than students with affiliated residency programs (2.56 versus 2.17; $p = 0.05$).

Most program directors reported that applicants “should” complete either two (52.5 percent) or three (32.5 percent) away rotations (mean, 2.3 ± 0.7). They estimated that most applicants complete an average of 2.6 ± 0.8 away rotations, compared to an average of 2.3 ± 1.2 reported by applicants. The majority (67.0 percent) of respondents felt that applicants should not be limited in the number of rotations they complete. Those who felt that the number should be limited most

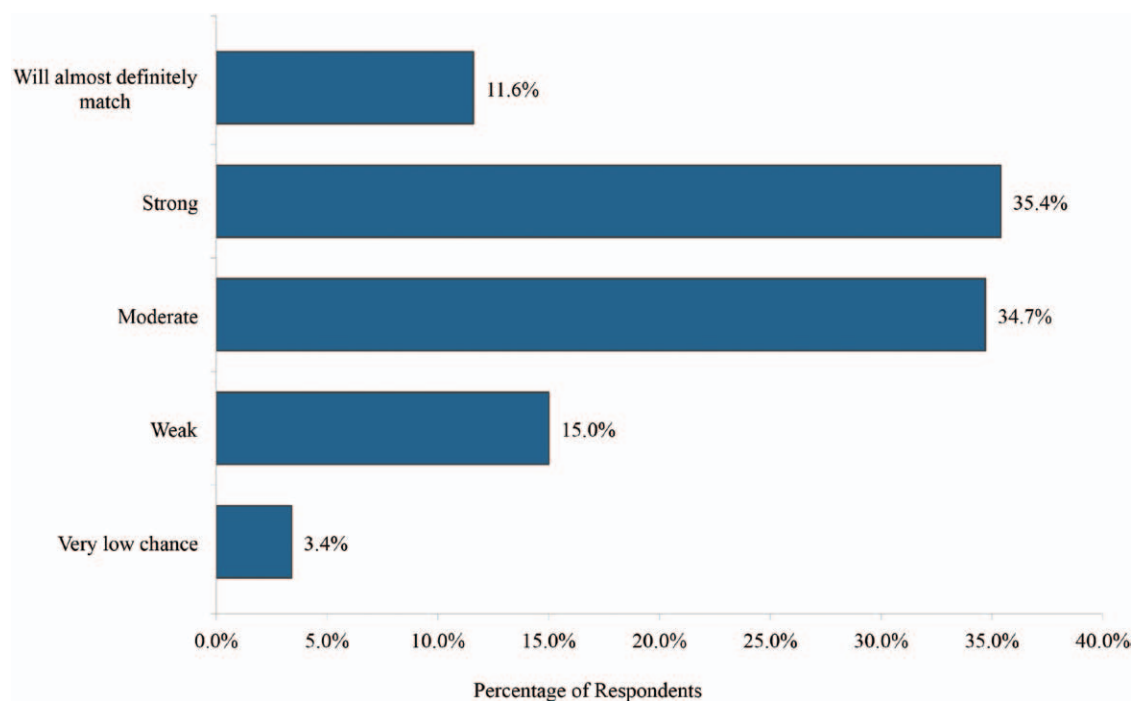


Fig. 1. Applicant responses to the question, How competitive do you believe your application is for matching in plastic surgery?

commonly reported that this limit should be two rotations (71.4 percent).

Away Rotation Objectives

When asked to rank student objectives on away rotations in order of importance, almost half of program directors (48.8 percent) indicated that “finding a good fit program” was the chief objective, and 36.6 percent reported “making a good impression at the host program.” Similarly, applicants reported that making a good impression at the program (44.6 percent) was the most important activity of an away rotation, followed by finding a good-fit program (27.7 percent) (Fig. 2).

Applicants and program directors were asked to rate the value of away rotations for various objectives from “no value” to “completely necessary.” Using weighted scores for these ratings (i.e., no value = 1 to completely necessary = 5), we found most applicants and program directors reported away rotations were valuable for finding a good-fit program and improving competitiveness of an application. Program directors and applicants reported significantly different perceptions regarding the value that away rotations serve in preparing students for residency (3.12 versus 4.07; $p < 0.01$). Both groups reported that away rotations have the least value in students’ overall medical education (Table 1).

Using a similar rating scale, applicants were asked what variables they used to choose away rotations (i.e., not important = 1 to most important = 5).

The most highly rated variable was a desire to match at the program at which they were rotating (4.46), whereas cost of the rotation was the lowest rated (2.82) (Table 2).

Away Rotation Activities

Among activities performed on away rotations, nearly all program directors reported that interacting with residents (50.0 percent) or with faculty (47.5 percent) was most important. Meanwhile, educational activities such as participating in the operating room and clinic or new consultations were valued significantly lower. Similarly, the majority of applicants (60.3 percent) ranked interacting with faculty or residents as the most important away rotation activity (28.1 percent and 32.2 percent, respectively). Participation in clinics and seeing new consultations were ranked significantly lower. Weighted averages were applied for rating the value of these activities (1 = least important to 5 = most important); the results are shown in Figure 3.

Residency Selection Criteria

Program directors were asked to rank, in order of importance, factors they consider when selecting candidates for the Match. Applicants’ performance on an away rotation (mean rank, 4.20) and their perceived good fit for the program (mean rank, 4.07) were the most highly scored criteria. The mean ranks of these criteria were significantly

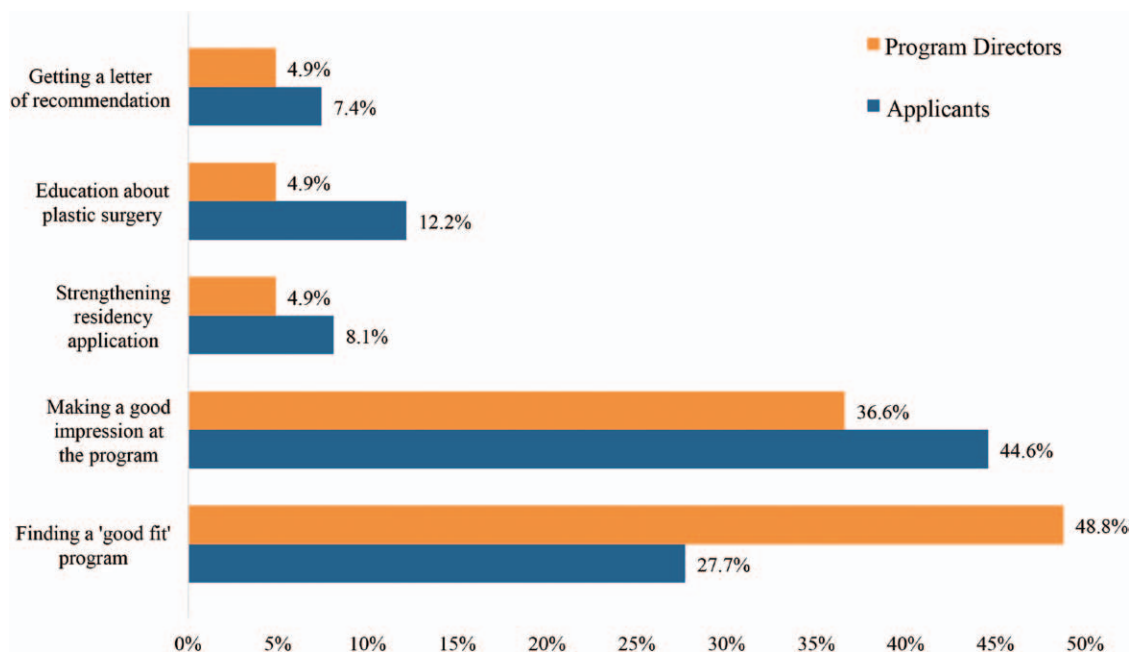


Fig. 2. Responses to the question, What is the most important objective in completing an away rotation?

Table 1. Value Provided by Away Rotations *

Applicant Criteria	Average Weighted Rank*
Your overall medical school education	3.57
Preparing for plastic surgery residency	4.07
Improving competitiveness for plastic surgery applications	4.14
Provided insight regarding whether the program was a good fit for me	4.34

*Weighted average (1 = no value, 5 = completely necessary).

Table 2. Importance of Rated Variables When Setting Up Away Rotations

Applicant Criteria	Average Weighted Rank*
Cost	2.82
Location	3.79
Desire to match at that program	4.46
Desire to get letter of recommendation	3.77
Ease of arranging	2.86
Desire to learn more about a program	3.95
Belief that you “had to” rotate	2.96

*Weighted average (1 = least important, 5 = most important).

higher than a candidate's overall application strength ($p < 0.05$) (Table 3).

A majority of program directors (90.2 percent) reported that a strong performance on an away rotation at their institution made a candidate more competitive. Most respondents (61.0 percent) felt that away rotations at other

institutions neither positively nor negatively influenced an applicant's competitiveness at their own program. Most programs (71.4 percent) did not have a blanket policy for interviewing applicants after hosting them for an away rotation; some (16.7 percent) reported that an away rotation at their institution would guarantee an interview.

Away Rotation Outcomes

Of 66 integrated plastic surgery programs training residents in the 2014 to 2015 academic year, 43 programs reported data for this study (65 percent response rate) regarding their current postgraduate year-1 residents. These responses represented 84 of 141 postgraduate year-1 positions (59.6 percent) available in the 2014 Match. Of the responding programs, three (7 percent) did not offer away rotations and three offered rotations but had no students enroll in academic year 2013 to 2014.

The average number of visiting medical students for the 2013 to 2014 academic year at each program was 8.7 (range, two to 28). In 2014, 27 percent of postgraduate year-1 positions were obtained by candidates who had completed an away rotation at the institution where they matched. An additional 17 percent of positions were obtained by applicants who attended the medical school affiliated with their program.

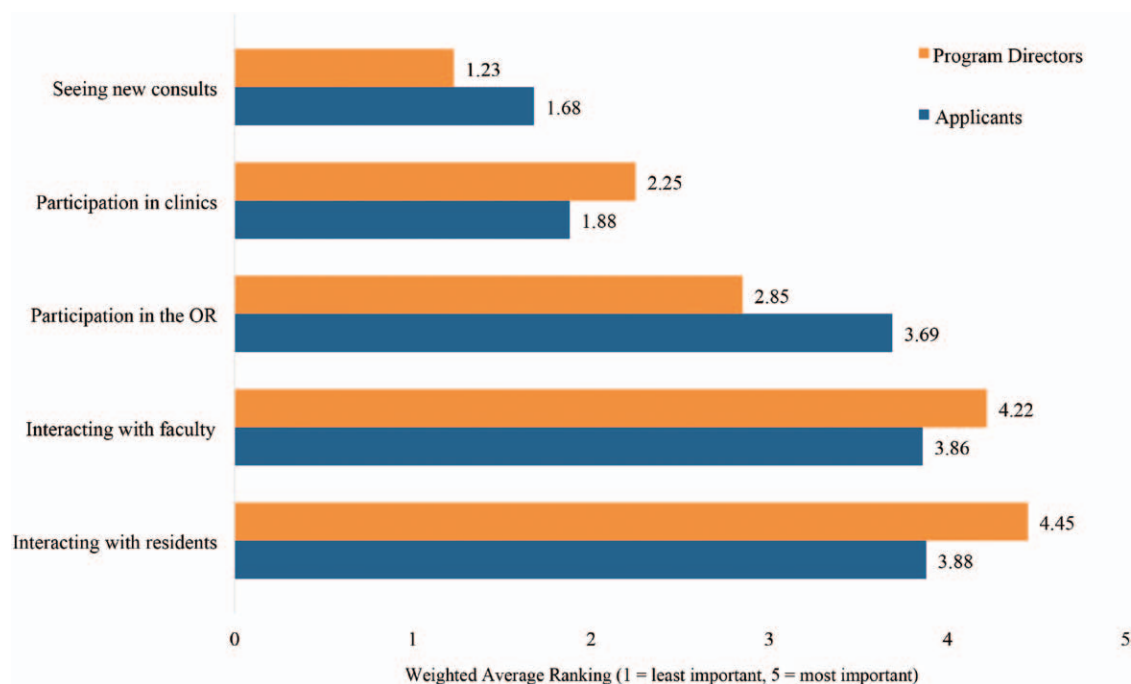


Fig. 3. Responses when asked to rank the value of activities when completing an away rotation. OR, operating room.

Table 3. Residency Selection Criteria

Applicant Criteria	Average Weighted Rank*
Applicant's performance on away rotation	4.2
Perceived good fit for the program	4.07
Overall strength of their application	3.76
Reputation of other programs at which they rotated	1.9
Geography of other programs at which they rotated	1.07

*Weighted average (1 = least important, 5 = most important).

DISCUSSION

Most applicants choose to complete two or three away rotations. Applicants believe away rotations improve their chances at matching into a program where they rotate, and that their primary interests for the rotations are interaction with residents and faculty and experiences in the operating room. Applicants reported that their primary objectives for away rotations were either making a good impression or finding a good-fit program. Similarly, program director results show that making a good impression and demonstrating a good fit between program and applicant are of central value for students participating in away rotations. Moreover, nearly all program directors reported that a strong away rotation performance improves an applicant's competitiveness for matching to their program. In fact, performance on an away rotation was ranked as the single most important criterion for residency selection.

We found that applicants with a strong away rotation performance are viewed more favorably by program directors, a factor that was even more important than overall application strength. Applicants may use these rotations to improve their chances of matching at a desired program. Likewise, applicants want to be sure that the program at which they match is a good fit. Away rotations during the fourth year seem to aid in both of these goals.

Based on the results of this study, the most important considerations in selecting away rotations reflect a desire to match at that program and seeing whether the program will be a good fit. The data also reflect a belief that students are expected to complete away rotations. This may explain why nearly all applicants (94.0 percent) reported participation in at least one away rotation, despite high costs (an average of nearly \$3600 in this sample).

Students on a limited budget may be at a disadvantage if they are able to participate in fewer away rotations because of financial constraints. As

demonstrated in this study, 91.1 percent of applicants believe an away rotation makes them more competitive at a program, and program directors clearly report that good performance on an away rotation improves competitiveness. The advantage conveyed by away rotations is potentially mutual to students and programs, as this time can help establish a good (or bad) fit for the residency in the view of the program faculty. However, if some students cannot afford these rotations, they may be at a disadvantage. The other financial disincentive is the cost of medical school tuition, which is not factored into this study. Monthly tuition can cost upward of \$4000, and students are therefore paying even more to participate in these experiences than the direct costs associated with an away rotation.

In addition to financial expense, there are substantial time costs to away rotations. The fourth year can be as short as 10 academic months at many medical schools (July to May). As such, 3 months (average, 13 weeks) spent on plastic surgery may represent nearly one-third of the total available clinical time as a senior medical student. This time is spent at the cost of other potentially valuable learning opportunities during the last year of general medical training. Although the majority of program directors indicated that senior rotations in general surgery (85 percent), critical care (80 percent), and medicine (55 percent) are highly valuable for prospective residents, applicants reported completing these rotations at a much lower frequency.

Although this study is limited by the standard constraints of psychometric research (i.e., cognitive and sampling biases), concern for these biases are limited by a high response rate and with good reliability and internal validity demonstrated during survey construction. With a response rate of greater than 60 percent in both groups, and demographically representative samples, concern for nonresponse bias is significantly diminished. For applicants, the survey was administered before the Match to improve response rate and to limit recall bias and any bias associated with interviews or the Match process.

CONCLUSIONS

Away rotations in plastic surgery play a crucial role in the selection of residents for the Match. In 2014, nearly half of first-year integrated plastic surgery residents were matched from away rotations or an affiliated medical school based on data reported about current residents.

Considered together with program directors' focus on away rotation performance and apparent fit for the program, these data suggest that applicants who are well known to a program may have an advantage in the Match. However, these rotations come with some costs to applicants in terms of direct reported expenses and may impact the "level of the playing field" depending on affordability and ability to take time off from their home medical school curriculum. Academic and educational leaders may consider placing limits on away rotations and creating curricula to improve the educational focus of these experiences.

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