



Contents lists available at ScienceDirect

The American Journal of Surgery

journal homepage: www.americanjournalofsurgery.com

Impact of orthopaedic candidate interview timing on successful matching

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ARTICLE INFO

Article history:

Received 19 March 2018
 Received in revised form
 23 April 2018
 Accepted 21 May 2018

Keywords:

Orthopaedic surgery
 USMLE
 Residency
 Interview timing
 Matching

ABSTRACT

Introduction: The impact of the interview date on matching in orthopaedic surgery residency is unknown.

Materials and methods: A retrospective review of interviewed applicants for a first-year orthopaedic surgery residency was conducted to determine the likelihood of matching based on being interviewed early versus late at our program. The United States Medical Licensing Examination (USMLE) scores were compared between early and late interviewees.

Results: Between 2012 and 2016, 316 candidates interviewed for residency positions. Twenty matched at our program and 230 at other institutions. No difference existed in USMLE scores. Late interviewees had significantly higher chances of matching at our center, but not nationwide in orthopaedic surgery ($p = 0.025$ and $p = 0.58$, respectively).

Conclusion: Later applicant interview was associated with greater chance of matching at our institution, but did not impact the candidate's ability to match in orthopaedic surgery at other programs.

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Introduction

Orthopaedic surgery is considered one of the most competitive specialties in the United States, and securing a position in an accredited residency training program can be extremely challenging for medical school graduates interested in a career in orthopaedic surgery.^{1–3} For residency programs, the criteria that should be used to select competitive and good-fit candidates are inconsistent and not well established, but include the United States Medical Licensing Examination (USMLE) Steps 1 and 2 scores.^{4,5}

Approximately 450 medical graduates apply to our orthopaedic surgery residency program annually; of this group, approximately 80 candidates are offered interviews for 5 post-graduate first-year resident positions, on 2 separate days that are typically 4–6 weeks apart. The impact of an early versus late interview on the likelihood of an applicant successfully matching at our, or any, orthopaedic residency training program in the United States has not been established, and is the objective of this study.

Materials and methods

To assess the impact of an early versus late interview date on an applicant successfully matching in orthopaedic surgery at our or any training program, we designed a retrospective analysis of the candidates interviewed at our institution over the last 5 years.

This study was deemed exempt from the requirement for review by our Institutional Review Board. An analysis was performed of all of the applicants who interviewed for a first-year residency position at our orthopaedic surgery residency training program for the 5 years between 2012 and 2017. During that period, there were no significant changes in our interview process or methodology: out-of-state candidates were usually interviewed early, whereas local and bordering-state individuals were offered a late interview. Five categorical first-year residency positions were offered each academic year, and interviews were granted on 2 separate dates (early and late, in November or December and January, respectively).

We used the Electronic Residency Application System (ERAS) to collect all of the interviewees' demographic data, which included the applicant's gender and USMLE Steps 1 and 2 performance scores. Data pertaining to the interviewed applicants who did not match at our program were retrieved from publicly available resources (National Residency Matching Program [NRMP] and other

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Table 1
Demographics of orthopaedic residency candidates.

	Matched at our institution	Did not match at our institution	Matched in orthopaedics	All applicants
Number of candidates	20 (6.3%)	296 (93.7%)	250 (79.1%)	316 (100%)
Gender				
Males	17 (85%)	247 (83.4%)	208 (83.2%)	264 (83.5%)
Females	3 (15%)	49 (16.6%)	42 (16.8%)	52 (16.5%)

official residency program websites) to determine whether they matched at other programs.

Descriptive analysis of the candidates' demographic data was performed, including gender, immigration status (American versus international graduates), as well as USMLE Steps 1 and 2 scores. Comparison between the USMLE scores of applicants who matched at our institution and applicants who did not was performed using the Student's T-test. We similarly assessed for differences in USMLE scores between early and late interviewees. We used the chi-square (χ^2) test to assess the relationship between interview timing and matching success at our institution, and separately between interview timing and matching anywhere else in the United States in orthopaedic surgery. A p-value of less than 0.05 was considered statistically significant. Data collected were processed by SPSS[®] version 24 (IBM Corp., Armonk, New York, USA).

Results

Data was analyzed on applicants who were granted interviews during the academic period of 2012–2016. Over this period, 316 applicants were interviewed at our institution. Among them, 158 (50%) were interviewed early, while the remaining 158 (50%) attended a late interview. Fifty-two (16.5%) were females and 264 (83.5%) were males. On the first interview date, 130 (41.1%) and 28 (8.9%) candidates were males and females, respectively, compared to 134 (42.4%) and 24 (7.6%) on the late interview. Of the 20 residents who matched at our institution, 3 (15%) were females and 17 (85%) were males. Four (20%) males and 2 (10%) females were interviewed early, whereas 13 (65%) males and only 1 (5%) female attended a late interview. The demographic characteristics of all applicants are presented in Table 1. All interviewees were American graduates and ranked.

Early interviewees had a USMLE Step 1 mean score of 249 (95% CI 226–271) compared to 249 (95% CI 227–271) for the later date interview applicants (T-test, $p = 0.742$). Similarly, the mean USMLE Step 2 scores were 257 (95% CI 235–279) and 257 (95% CI 238–276) for the early and late interviewees, respectively (T-test, $p = 0.784$). Moreover, residents who matched at our institution had mean Step 1 and 2 scores of 247 (95% CI 223–270) and 258 (95% CI 239–277), compared to scores of 249 (95% CI 227–271) and 257 (95% CI 236–278) for applicants who did not (T-test, $p = 0.279$ and $p = 0.977$, respectively). Table 2 summarizes all USMLE test scores in our study groups. Mean USMLE step scores based on the applicants' gender are resumed in Table 3.

Of the 316 applicants interviewed at our institution, 250 (79.1%) ultimately matched in orthopaedic surgery residency, and 123 of the 250 candidates (49.2%) had an early interview at our institution,

while 127 (50.8%) had a late interview. Matching at some accredited orthopaedic surgery training program in the United States did not statistically differ between the applicants who were granted an early interview compared to those who were interviewed late (χ^2 , $p = 0.58$). To explore the effect of the interview timing on successful matching in our institution, we included residents accepted from 2012 to 2017 (25 residents in total, 5 residents per academic year). Seven (28%) of the matched medical graduates were interviewed early, compared to 18 (72%) on the second interview day (χ^2 , $p = 0.025$). Overall, of the residents who matched in our institution per academic year, 1.4 residents interviewed early and 3.6 residents interviewed later.

Discussion

The residency application process starts in ERAS, where medical graduates fill and submit their applications to be reviewed by the residency programs. Competitive candidates will then be offered an interview. The interviews are followed by the ranking process, in which both applicants and residency programs rank each other through the NRMP to facilitate the residency selection. The match process relies upon the creation of a final rank list of preference of the candidate and the residency training program. The generated certified ranking lists will then match each applicant with their highest-ranked residency program that has simultaneously highly ranked the applicant.⁶

Orthopaedic surgery residency remains one of the most difficult specialties to match into for applicants in the United States.^{1–3} In fact, our institutional experience reflects this challenge that resulted from a disparity between the number of applicants and the available accredited positions at our center: our selection committee had to screen through more than 1800 applications over the course of the last 4 years, and granted interviews to only 350 (19%) of the applicants seeking one of our 20 available first-year residency positions over that period. Moreover, orthopaedic residency programs typically rely on non-standardized interview selection criteria that may include medical school scholastic performance, USMLE steps scores, research activities, and recommendation letters, factors that have not been consistently shown to predict the ideal resident's performance once in a residency training program.^{4,7,8}

In our study, there was no difference between our residents' USMLE steps scores and those of the applicants' pool who matched in orthopaedic surgery. Similarly, USMLE scores did not differ based on the applicant's gender. Moreover, although an early versus late interview time did impact the likelihood of application success in our program, it did not affect the match success of our applicants

Table 2
Mean USMLE scores of our population subgroups.

	Matched at our institution	Did not match at our institution	Matched in orthopaedics	All applicants
USMLE Step 1 (mean score)	247 (95% CI 223–270)	249 (95% CI 227–271)	249 (95% CI 227–271)	249 (95% CI 227–271)
USMLE Step 2 (mean score)	258 (95% CI 239–277)	257 (95% CI 236–278)	258 (95% CI 238–278)	257 (95% CI 237–277)

Table 3
Mean USMLE scores based on the applicants' gender in our population subgroups.

	Gender	Matched at our institution	p-value	Did not match at our institution	p-value	Matched in orthopaedics	p-value	All applicants	p-value
USMLE Step 1 (mean score)	Male	248 (95% CI 225–272)	0.548	249 (95% CI 226–271)	0.743	250 (95% CI 229–272)	0.201	250 (95% CI 228–272)	0.51
	Female	238 (95% CI 218–258)		247 (95% CI 235–259)		246 (95% CI 224–268)		245 (95% CI 224–266)	
USMLE Step 2 (mean score)	Male	259 (95% CI 240–279)	0.1	253 (95% CI 233–274)	0.331	259 (95% CI 239–278)	0.162	257 (95% CI 237–278)	0.492
	Female	251 (95% CI 246–256)		259 (95% CI 253–266)		256 (95% CI 234–278)		256 (95% CI 235–277)	

nationwide. Many of our interviewees were considered competitive at our program, likely suggesting they were also competitive at other training programs. Garnering a large number of interviews is suggested to increase the likelihood of matching. As these candidates are being interviewed, they may become more comfortable with the process and subsequently improve their interview capabilities to increase their chance of matching.

Candidates interviewed on the second date had better chances of getting accepted over the past 5 years at our institution. This may have been due to the fact that most, if not all, of the applicants at the later interview probably attended several interviews before being granted one at our institution. Unfortunately, this hypothesis could not be addressed in our study due to the lack of pertinent data. However, a geographic preference might explain our findings, given the fact that local or bordering-state candidates were offered a late interview and had higher chances of matching in orthopaedic surgery at our institution. Depending upon when and how the final resident selections are made, another explanation might be that the members of our selection committee might simply have a better recollection of the more recent interviewees or have become more familiar with the local applicants whom they supervised and/or worked with. The higher success in matching at our institution for late-interview applicants might also be explained by the reciprocal ranking of the program and candidates of each other.

This study has some limitations. Although observational and retrospective in nature, the data retrieved were not subjected to a recall bias. Our analysis was performed at a single institution, and all of our interviewees were American graduates; therefore, they may not entirely reflect the experience of other programs and institutions. Moreover, we chose to only examine USMLE scores among applicants and their impact on successful matching in orthopaedic surgery because they are regarded as the most standardized academic performance assessment tools. We did not analyze the impact of the program's and applicants' ranking lists on successful matching because the NRMP portal highly favors the latter throughout the match process, which constitute privileged information that could not be retrieved.

In summary, there is still a large discrepancy between the numbers of applicants applying to an orthopaedic surgery first-year residency and the number of positions available. At our institution, candidates interviewed early had lower chances of successful matching at our orthopaedic surgery training program, but not in other national institutions.

Funding

This research did not receive any specific grant from funding agencies in the public, commercial, or not-for-profit sectors.

Conflicts of interest

None of the authors have any financial or personal relationships with other people or organizations that might pose a conflict of interest in connection with the submitted article.

Disclaimers

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