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Revisiting Differences in Fourth-Year Orthopaedic Away Rotation Opportunities and Fees Among Allopathic and Osteopathic Medical Students

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Introduction: Fourth-year away rotations are an important modifiable variable proven to increase students' opportunities to match into orthopaedic surgery. The purpose of this study was to determine differences in away rotation eligibility requirements and cost of rotation between allopathic and osteopathic students during the 2023 application cycle. Eligibility requirements and fees were then compared with the 2021 application cycle.

Methods: A cross-sectional study was performed during the 2023 application cycle of all nonmilitary, Accreditation Council for Graduate Medical Education (ACGME)-accredited orthopaedic surgery residency programs (n = 194). Each program's website, affiliated school of medicine's website, visiting student application service portal, and Residency Explorer tool were searched for eligibility criteria, associated rotation fees, and other rotation requirements. Two-sample Z tests for proportions were utilized to compare differences in programs with differing requirements for students based on academic degree type. Data were compared statistically with previously reported data from the 2021 application cycle.

Results: In 2023, there were more programs that restricted osteopathic medical students from away rotations than programs that restricted allopathic medical students (12/194, 6.2% vs. 0/194, 0.0%; $p < 0.001$). All 12 programs were formerly ACGME-accredited before the integration into a single accreditation system. There was a decrease in the number of programs restricting osteopathic medical students from away rotations compared with the 2021 application cycle (18/194, 9.3% vs. 12/194, 6.2%; $p = 0.254$). Fees associated with away rotations ranged from $25 to $4,000 for both allopathic and osteopathic students. The number of programs that charged osteopathic medical students higher rotation fees than programs that charged allopathic students when compared with the 2021 application cycles decreased (1/194, 0.5% vs. 5/194, 2.6%; $p = 0.049$).

Conclusions: While some programs continue to have away rotation eligibility requirements that prohibit osteopathic medical students from rotating, only one residency program currently charges osteopathic medical students a higher fee to rotate than allopathic medical students.

Disclosure: The **Disclosure of Potential Conflicts of Interest** forms are provided with the online version of the article (http://links.lww.com/JBJSOA/A655).

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Introduction

The American Council for Graduate Medical Education (ACGME) and American Osteopathic Association (AOA) concluded a formal integration into a unified graduate medical education (GME) accreditation system in June, 2020[1]. The transition to a single accreditation system (SAS) was designed to both provide improved uniformity in residency program training nationwide and expand opportunities for allopathic and osteopathic medical students. However, there remain significant disparities in match rates between allopathic and osteopathic students within certain specialties[2,3]. Preliminary studies exploring the effects of a SAS have reported significantly lower match rates for osteopathic medical students for surgical subspecialties, including orthopaedic surgery[4].

Orthopaedic surgery continues to be one of the most competitive specialties to match for residency[5,6]. During the 2022 to 2023 cycle, 1,673 applicants applied for 899 orthopaedic surgery positions nationwide[7,8]. All 899 positions were filled following the primary residency match, demonstrating a 53.7% match rate[7,8]. With many interview opportunities transitioning to virtual platforms, students appear to apply more broadly. In 2023, the average number of applications per orthopaedic surgery applicant was the second highest at 78.9 for US medical graduates, second only to urology[7]. In the 2022 to 2023 match cycle, there was a significantly lower match rate for osteopathic students than allopathic students who applied for orthopaedic surgery[3]. Lower match rates for osteopathic students compared with their allopathic counterparts extended to other surgical subspecialties including neurosurgery, thoracic surgery, plastic surgery, vascular surgery, general surgery, and otolaryngology[3].

Considering the difficulty of matching into an orthopaedic surgery residency, fourth-year away rotations are a critical opportunity for medical students to showcase themselves and determine which programs best fit their needs. A 2021 survey of orthopaedic surgery residency program directors highlighted the value of away rotations, reported away rotations as the second highest important factor when extending interview offers to applicants[9]. Recognizing the importance of away rotations, inequalities in away rotation access may create discriminatory barriers. White et al. assessed away rotation eligibility criteria and associated rotation fees in 2021 to identify any discrepancies in opportunity between allopathic and osteopathic medical students[10]. This analysis took place after the implementation of a SAS and demonstrated significantly more residency programs prohibited osteopathic students than allopathic students from applying for away rotations[10].

Before the SAS, the literature discussed the uncertainty of its effect on osteopathic students' access to away rotations and associated match rates at previously ACGME-accredited programs, as well as the same effect on allopathic students at previously AOA-accredited programs[2]. To determine if access to away rotations has improved for osteopathic students, authors sought to answer the following questions: (1) Are there programs that have away rotation requirements prohibit osteopathic students from applying? (2) Are there programs offer different rotation fees for allopathic and osteopathic students? (3) Have there been any changes in eligibility requirements or rotation fees since the 2021 application cycle? The authors hypothesized that there would be no change in away rotation requirements or rotation fees when compared with the 2021 application cycle.

Methods

A cross-sectional review of the 2023 residency application cycle (April to November) was performed to assess eligibility requirements and fees for away rotations based on academic degree (allopathic vs. osteopathic). Eligibility requirements and fees were then compared with that previously reported for the 2021 application cycle[10]. There were 202 ACGME-accredited orthopaedic residency programs identified from the Electronic Residency Application System (ERAS) Association of American Medical College (AAMC) directory[11]. Military orthopaedic surgery residency programs (n = 8) were excluded from this analysis[12].

The ACGME website was used to identify every residency program's name and geographic location[13]. Residency program websites, affiliated medical school websites, and the AAMC (Washington, DC) Visiting Student Learning Opportunities (VSLO) portal were reviewed for publicly available information of medical student away rotation eligibility criteria and associated away rotation fees. Programs with eligibility criteria that restrict access to away rotations based on student degree (allopathic vs. osteopathic) were recorded. Certain published information that prohibit away rotations based on academic degree type included statements such as "must be an upcoming fourth year medical student at a domestic Liaison Committee on Medical Education (LCME)-accredited medical school" and "only senior medical students enrolled in good standing in an LCME-accredited school will be offered a senior elective in this school of medicine."

The proportions of ACGME-accredited residency programs restricting osteopathic students during the 2023 application cycle were compared with the proportion of programs restricting allopathic students. The proportions of programs with restrictions based on academic degree type were compared with those previously reported in 2021[10]. All programs were then stratified based on prior accreditation status (ACGME vs. AOA) for further analysis. This stratified data were also compared with that of the 2021 application cycle. The range of rotation fees at programs requiring a fee was identified, and the proportions of programs charging osteopathic students higher fees were compared between the 2021 application cycle and 2023 application cycle. Statistical analysis was performed using Microsoft Excel (Seattle, WA). Analysis consisted of two-sample Z tests for proportions. A p-value less than 0.05 was utilized to represent statistical significance.

Results

Eligibility

There were 194 ACGME-accredited orthopaedic surgery residency programs included in this study. Before the finalization of the SAS, 38 (19.6%) of orthopaedic residency

programs were previously AOA-accredited, while 153 (78.9%) were previously ACGME-accredited, while 3 (1.6%) new programs were identified. More residency programs publicly published eligibility criteria that restricted osteopathic medical students from an away rotation than programs that restricted away rotations for allopathic students (12/194, 6.2% vs. 0/194, 0.0%; $p < 0.001$). In evaluation of accreditation status before the SAS, all 12 programs prohibiting osteopathic medical students from applying for away rotations were previously solely ACGME-accredited programs. No formerly AOA-accredited orthopaedic residency programs had eligibility criteria that restricted allopathic medical students from applying for an away rotation. When stratifying based on pre-SAS status, a larger proportion of former ACGME-accredited programs restricted osteopathic students from away rotations than former AOA-accredited programs restricted allopathic students from rotating (12/153, 7.8%% vs. 0/38, 0.0%; $p = 0.076$).

Of the 12 residency programs currently restricting osteopathic students from away rotations, 9 had stated on their affiliated website that only students at an LCME-accredited medical school were permitted to apply for an away rotation. The remaining 3 program websites stated that prospective students are permitted to apply for an away rotation through the VSLO portal, but access to the application through VSLO is unavailable to osteopathic students.

Cost

The cost of applying for an away rotation ranged from $25 to $4,000. There was one program (0.5%) that required different away rotation application fees based on academic degree type. However, many programs did not publicly publish rotation fees on their affiliated website or on VSLO (44/194, 22.7%).

Comparison

There was no difference in prohibitory eligibility criteria based on applicant degree type when compared with the 2021 application cycle (18/194, 9.3% vs. 12/194, 6.2%; $p = 0.254$)[10]. In addition, there was no difference between previously ACGME-accredited programs restricting osteopathic students when compared with the 2021 application cycle (16/153, 10.3% vs. 12/153, 7.7%; $p = 0.430$). There was no difference between previously AOA-accredited programs restricting allopathic students when compared with the 2021 cycle (2/38, 5.3% vs. 0/38, 0.0%; $p = 0.155$). Compared with the 2021 application cycle, there was a reduction in the number of programs charging osteopathic medical students increased rotation fees relative to allopathic students (1/194, 0.5% vs. 5/194, 2.6%; $p = 0.049$).

Discussion

The consolidation of the ACGME and AOA organizations into a SAS was initiated with the intent of establishing nationwide standards to improve consistency in GME. With other recent changes to medical education, such as the change of the United States Medical Licensing Exam Step 1 to pass/fail, orthopaedic residency program directors have emphasized the elevated importance of away rotations for interview selection[2,9,14-18]. The importance of fourth-year away rotations has been clearly established for matching into orthopaedic surgery. Fortunately, away rotation access has shown improvement since the transition of the ACGME and AOA into a SAS from 2021 to 2023. White et al. reported discrepancies in the percentage of allopathic and osteopathic medical students who were considered eligible for applying for an away rotation at ACGME-accredited programs in 2021, on year after the SAS was implemented[10]. The authors also reported variations in fees associated with away rotations based on the academic degree type of the applicant. There were 5 programs that required larger fees for osteopathic students (up to $5,000), while there were no programs that had higher fees for allopathic students[10]. This study provided an updated analysis of away rotation eligibility requirements and associated fees using the 2023 application cycle to determine if discrepancies based on academic degree bias have improved.

The impact of the SAS initially raised concerns regarding its effects on the ability of students to obtain away rotations and subsequent interview offers[2,19]. Although the number has reduced, there remain orthopaedic surgery residencies that publicly publish eligibility criteria which limits rotation opportunities for applicants based on degree type. This demonstrates some improvement from the 2021 application cycle when compared with the 2023 application cycle; however, this improvement was not statistically significant. While there were no programs that restricted allopathic medical students from rotating, there were former ACGME-accredited residency programs that restricted osteopathic students from rotating. There was only one residency programs that required different rotation fees based on the student's degree type. Although only one program required a higher rotation fee for osteopathic students, this substantial fee ($4,000) seems unreasonable and likely deters many osteopathic students from applying. The elimination of fee disparities between allopathic and osteopathic students is an encouraging step toward equal access and transparency from residency programs. Although most residency programs lack discriminatory criteria for away rotations, there remain differences in the consideration of allopathic and osteopathic applicants at some institutions. The National Residency Match Program performed a program director survey in 2022 that showed an average of 47.6% of applications were denied interviews based on a standardized screening process[20]. In this survey, 63% of respondents reported that they seldom or never interview osteopathic applicants while only 16% reported they seldom or never interview allopathic applicants[20]. Further data from the National Residency Match Program reports the average match rates into orthopaedic surgery by allopathic and osteopathic students from 2019 to 2023 are 74.5% and 59.9%, respectively[21]. This highlights the importance of transparency regarding cost and selection for rotations since certain programs may publicly appear to offer equal opportunity to allopathic and osteopathic students while internally screening out students based on academic degree type. The disproportionate number of programs seldom or never

interviewing osteopathic applicants suggests that these internal screening processes may be due to historical beliefs regarding osteopathic medical education. However, another possible factor affecting osteopathic applicants' orthopaedic opportunities is the lack of robust orthopaedic research infrastructure or faculty mentors at their respective medical school. Allopathic and osteopathic medical degrees are considered to be equivalent, and all training programs have uniform accreditation standards. It is important to continue to address factors hindering osteopathic applicants from achieving equal opportunity in their pursuit of orthopaedic surgery residency.

Another major concern for medical students is the financial burden from ERAS applications and away rotation fees[16,22,23]. Students who matched into orthopaedic surgery have been shown to spend significantly more during the application cycle than those matching into other medical specialties[22,23]. When coupling the added financial burden of applying, rotating, and interviewing, with the expenses of tuition, medical students are prone to sizable financial debt. The average debt of medical school graduates is overwhelming and continues to rise[23-25]. With 73% of students graduating with debt and the average debt per student costing over $240,000, students are forced to take financial obligations into consideration when deciding which programs to apply to[23-25]. Medical students must consider these substantial costs when planning their application cycle and may be deterred from seeking away rotations that require sizable fees. The requirement of higher fees for certain medical degrees may appear as an indirect means of discouraging students to apply from that particular away rotation[10]. Fortunately, for orthopaedic surgery applicants, the variations in fees based on degree type appears to have nearly been eliminated. There are many factors considered by programs in resident selection. Improved transparency regarding the cost and selection criteria for away rotations would provide applicants with a more appropriate sense of their likelihood of matching at certain programs. Subsequently, this would allow applicants to better allocate time and funds in their pursuit of orthopaedic surgery residency.

This study is not without limitations. All data were collected from various publicly available sources. This information relies on the publication of the individual programs' most current eligibility requirements; therefore, information may not be the most current representation of programs' away rotation application process. It is important that orthopaedic residency programs publish up-to-date and accurate information for prospective applicants. Furthermore, many programs (22.7%) did not publish rotation fees on their institutional website or through VSLO. The cost associations would be strengthened if this information was obtainable. It is not unreasonable to presume that programs may utilize unpublished internal screening protocols for away rotations that may prohibit some applicants from rotating.

There are several ways that may potentially help increase the representation of osteopathic physicians in the field of orthopaedic surgery and specifically within orthopaedic surgery residency training. First, increased transparency from residency programs would allow osteopathic medical students to focus learning opportunities on programs that have been receptive to training osteopathic physicians. We encourage all programs, either on their own websites or on the Orthopaedic Residency Information Network to publicly state their history of rotating, interviewing, and matching osteopathic candidates. Second, access and opportunity are necessary to increase the osteopathic presence in the orthopaedic community. We encourage programs that have never allowed osteopathic students to rotate to give the opportunity and subsequently consider interviewing those students who have equivocal performance compared with their MD colleagues. Third, sponsorship of competitive osteopathic candidates is essential. Programs that have osteopathic research assistants who perform well should consider these students for residency training at their institution and support their candidacy at other programs. Fourth, continued advocacy is necessary for any change. Modica et al. recently showed that there are merely 58 osteopathic residents at former allopathic programs, up from approximately 40 a few years ago[26,27]. These osteopathic physicians will need to advocate for others to be interviewed and match at their programs, raise awareness of this issue, and serve as mentors and sponsors for other osteopathic candidates. Finally, blinding the degree of applicants during the application and interview cycle would potentially mitigate some potential bias, although this may be challenging given the current application process. In summary, decreasing preconceived notions that every allopathic candidate would be better than any osteopathic candidate and opening the door to allow an osteopathic student to rotate, interview, or be ranked at an institution that had not previously done so would be the first step in equalizing the opportunities for everyone within the field of orthopaedic surgery.

Conclusion

While some programs continue to have away rotation eligibility requirements that prohibit osteopathic medical students from rotating, only one residency program currently charges osteopathic medical students a higher fee to rotate than allopathic medical students. Overall, the number of programs charging higher fees to osteopathic medical students decreased from the 2021 cycle to the 2023 cycle. ■

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