



## AOA Critical Issues in Education

# Diversity-Related Positions in Orthopaedic Surgery Residency Programs

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**Background:** The Association of American Medical Colleges and the American Academy of Orthopaedic Surgeons have incorporated diversity and inclusion as one of their primary goals. Orthopaedic surgery remains the least diverse medical specialty when measured for practicing physicians and trainees. The purpose of this study was to determine the number and distinct types of diversity, equity, and inclusion (DEI) positions within orthopaedic surgery residency programs in the United States.

**Methods:** The Fellowship and Residency Electronic Interactive Database was used to obtain a list of all Accreditation Council for Graduate Medical Education–accredited orthopaedic surgery residency programs. The following was collected from 193 residency program websites between June 6, 2022, and June 26, 2022: program location, university or community based, allopathic or osteopathic recognition, number of faculty in the orthopaedic department, number of residents per year, diversity-related statements, and diversity-focused faculty positions.

**Results:** Of the 193 programs evaluated, 74 (38.9%) included DEI statements on their website while only 42 (21.8%) had at least one DEI-specific faculty role (e.g., diversity committee, diversity liaison, vice chair for DEI). For 16 (8.3%) programs, the faculty role was nonspecific to the orthopaedic residency program. Nonspecific roles were primarily created by the affiliated school of medicine, but in 4 (2.1%) outlier cases, faculty members assumed DEI roles through a medical center, a graduate medical education program, or a department of surgery.

**Conclusions:** Less than half of orthopaedic surgery residency programs currently advocate for DEI on their associated websites while fewer than 25% have a DEI faculty position. Previous studies have called for a greater number of DEI positions and committees among orthopaedic residencies because of the lower admittance rate of qualified Under Represented in Medicine (URiM) applicants. A role dedicated to DEI may increase the number of women and URiM applicants pursuing a career in orthopaedic surgery.

### Introduction

Women currently comprise approximately 15% of orthopaedic surgery residents and 6.5% of practicing orthopaedic surgeons<sup>1,2</sup>. Orthopaedic surgery is the least diverse of all

medical specialties<sup>3,4</sup>. Although there has been a 27.3% increase of women in orthopaedic surgery residency from 2005 to 2017, this was the second lowest change after ophthalmology (14.5%) but drastically less than thoracic surgery (111.2%) and plastic

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surgery (68.1%)<sup>5</sup>. To address this, the American Academy of Orthopaedic Surgeons put forth a strategic plan to increase diversity in the field of orthopaedics, and many orthopaedic specialty societies have created diversity-focused committees or task forces<sup>6</sup>. The Association of American Medical Colleges has also incorporated diversity, equity, and inclusion (DEI) as one of their primary goals to address the lack of diversity in medicine<sup>7</sup>.

Several factors contribute to the lack of diversity in orthopaedic surgery including male dominance, sex bias in the residency application process specifically during interviews, a limited number of minority mentors, and lack of early exposure<sup>8</sup>. Pipeline programs such as the Perry Initiative and Nth Dimensions have been incredibly effective at recruiting more women and minorities to join the field. The Perry Initiative involves early outreach to female students interested in engineering and orthopaedics, social media outreach and promotion of diversity in the field of orthopaedics, and scholarships/grants for Under Represented in Medicine (URiM) students interested in away rotations at orthopaedic surgery residency programs throughout the United States<sup>8</sup>. The Perry Initiative has reached more than 12,000 young women in high school and medical school, 20% of whom have matched into an orthopaedic residency<sup>9</sup>. The Nth Dimensions Summer Internship Program, an 8-week long clinical and research internship with a practicing preceptor concluding with a poster presentation at the National Medical Association assembly, has also shown a positive impact on the odds of a participant applying to orthopaedic residency<sup>10</sup>.

A recent study by Cohen et al. evaluated 187 websites for orthopaedic surgery residency programs to determine each program's commitment to promoting diversity, equity, and inclusion<sup>11</sup>. The authors found that residency websites included a mean of  $4.9 \pm 2.1$  diversity and inclusion elements, with 21% (40 of 187) including 7+ elements. Although there was no statistical difference in the top National Institutes of Health funded programs, university-based or affiliated programs ( $5.2 \pm 2.0$ ) did have higher diversity scores in comparison with community-based programs ( $3.6 \pm 2.2$ ) ( $p = 0.003$ ). Many orthopaedic residency programs have begun to promote DEI statements/initiatives on their program website and created away rotation scholarships exclusively for URiM students<sup>11</sup>. The purpose of this study was to determine the number and different types of DEI positions within orthopaedic surgery residency programs in the United States.

## Material and Methods

The current study did not require Institutional Review Board approval because the data collected for the study was publicly available.

### Program Selection

The Fellowship and Residency Electronic Interactive Database (FREIDA Online) was used to obtain a list of the 203 Accreditation Council for Graduate Medical Education (ACGME) orthopaedic surgery residency programs. Military-based programs (9) were excluded because of restrictions on the kinds of information they can host on their government website. One other program with a nonfunctioning website was also excluded.

Websites for the remaining 193 orthopaedic surgery residency programs were evaluated between June 6, 2022, and June 26, 2022. Each program website was accessed and evaluated by 2 coauthors.

### Criteria for Evaluation

Data were collected on program location, university or community affiliation, allopathic or osteopathic recognition, number of faculty, number of residents per year, diversity-related initiatives or statements, and diversity-focused faculty positions.

### Diversity-Related Initiatives or Statements

The presence of any DEI programs or statements about DEI was recorded. This included diversity and nondiscrimination statements, diversity scholarships, diversity-related goals, recruitment programs for URiM medical students, and departmental events or newsletters that emphasized DEI.

### Diversity-Focused Faculty Positions

All residency program websites were evaluated for the presence of a DEI-related faculty position. Search terms were identified as common titles for diversity faculty roles in orthopaedic surgery through a preliminary search. Twelve search terms were used on each program website including diversity committee; DE&I committee; DEI committee; diversity and inclusion committee; diversity, equity, and inclusion steering committee; chair of diversity; vice chair for diversity, equity, and inclusion; co-director of diversity and inclusion; co-director of diversity, equity, and inclusion; co-director of equity, diversity, and inclusion; and diversity and inclusion officer. In addition, any medical schools or medical centers affiliated with the residency programs were examined for similar faculty positions. If an orthopaedic faculty member served in such a role at the school of medicine or medical center, this was recorded separately.

### Source of Funding

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

## Results

From FREIDA, 203 ACGME-accredited orthopaedic residencies were identified. Military-based programs (9) and one program with a nonfunctioning website were excluded, leaving 193 ACGME-accredited orthopaedic surgery residency programs for evaluation. In total, 102 of the 193 programs (52.8%) were university-based, 63 (32.6%) were university-affiliated community-based, and 28 (14.5%) were community-based programs. Most programs were allopathic (155 of 193, 80.3%) while 38 (19.7%) were osteopathic. The average number of residents per year was 22.9 (10-70), and the average number of physicians (MD/DO) in these programs was 36.3 (3-165).

Of the orthopaedic residency programs studied, 74 of 193 programs (38.3%) included diversity statements on their website and were 11.9 times more likely to have a DEI faculty role compared with programs that did not have a DEI statement. DEI faculty positions were less common, with only 42 (21.8%) of the 193 programs having at least one such role. The

TABLE I DEI Faculty Roles\*

Location	Program Affiliation	MD/DO Program	No. of Residents Per Year	No. of MD/DO Faculty	DEI Statement?	DEI Role Affiliation	Name of Role
AZ	UACB	MD	10	13	Yes	Ortho	Diversity Committee Chair
CA	UB	MD	25	31	No	Ortho	Chief of Diversity and Outreach Officer
CA	UACB	MD	20	14	Yes	Ortho	Diversity Committee Chair
CA	CB	MD	20	49	Yes	Ortho	Diversity Committee Chair
CA	UB	MD	30	53	Yes	Ortho	Diversity Committee Chair
CA	UB	MD	25	39	Yes	Ortho	Diversity Committee Chair
CA	UB	MD	35	58	Yes	Ortho	Diversity Committee Chair
CT	UB	MD	25	48	Yes	SOM	Department Diversity Vice Chairs & Champions
IA	UB	MD	30	42	Yes	Ortho	Diversity Committee Chair
IL	UB	MD	45	30	Yes	Medical Center	Director of Diversity and Inclusion
IL	UB	MD	25	30	Yes	Dept of Surgery	Vice Chair of Women Surgeons Committee
KY	UB	MD	25	30	Yes	SOM	Diversity Ambassador
LA	UACB	MD	20	36	Yes	Ortho	Diversity and Inclusion Officer
MA	UB	MD	60	62	Yes	SOM	Diversity Council Member
MA	UB	MD	25	65	Yes	SOM	Equity, Vitality, and Inclusion Committee
MD	UB	MD	30	37	Yes	Ortho	Diversity and Inclusion Officer
MI	UB	MD	?	35	Yes	Ortho	Diversity Committee Chair
MN	UB	MD	40	68	Yes	Ortho	Diversity Committee Chair
MO	UB	MD	25	40	No	SOM	Department Diversity Liaison
MO	UB	MD	40	71	Yes	Ortho	Diversity Committee Chair
MO	UB	MD	25	35	No	SOM	Vice Chairman for Diversity, Equity, and Inclusion
NC	UB	MD	40	106	Yes	Ortho	Chair of Orthopaedic Inclusion Workforce
NC	UB	MD	25	74	Yes	Ortho	Co-Director of Diversity and Inclusion for the Department of Orthopaedic Surgery
NC	UB	MD	25	26	Yes	Ortho	Department Diversity Liaison
NH	UB	MD	20	23	Yes	SOM	Diversity Committee Chair
NM	UB	MD	25	26	Yes	Ortho	Department Diversity Liaison
NY	UB	MD	70	165	Yes	Ortho	Diversity Committee Chair
NY	UB	MD	25	23	Yes	SOM	Faculty Diversity Ambassador
NY	UB	MD	30	22	No	GME	Faculty Mentor for Inclusion
NY	UB	MD	30	71	Yes	Ortho	Vice Chair for Diversity, Equity, and Inclusion
PA	CB	DO	25	28	No	SOM	Diversity Advisory Council Member
PA	UB	MD	40	55	No	SOM	Diversity Advisory Council Member
PA	UB	MD	25	27	Yes	SOM	Diversity Committee Chair
PA	UB	MD	40	61	Yes	SOM	Vice Chair Diversity, Equity, and Inclusion
RI	UB	MD	30	65	Yes	Ortho	Diversity Committee Chair
TN	UB	MD	25	47	Yes	Ortho	Diversity Committee Chair
TX	UB	MD	20	29	Yes	Dept of Surgery	Diversity Committee Chair
TX	UB	MD	30	29	Yes	Ortho	Diversity, Equity & Inclusion Panel
TX	UB	MD	35	26	Yes	SOM	Interim Vice Dean for Inclusion and Diversity
UT	UB	MD	30	99	Yes	Ortho	Diversity Committee Chair

*continued*

TABLE 1 (continued)

Location	Program Affiliation	MD/DO Program	No. of Residents Per Year	No. of MD/DO Faculty	DEI Statement?	DEI Role Affiliation	Name of Role
VA	UB	MD	25	29	Yes	Ortho	Vice Chair for Diversity, Equity, and Inclusion
WA	UB	MD	40	53	Yes	Ortho	Diversity and Inclusion Workgroup

\*? = data not available, CB = community-based, DEI = diversity, equity, and inclusion, Dept of Surgery = Department of Surgery, DO = Doctor of Osteopathic Medicine, GME = Office of Graduate Medical Education, MD = Doctor of Medicine, Ortho = Orthopaedics Department, SOM = School of Medicine, UACB = University-affiliated Community-based, UB = University-based.

titles for these roles varied with each program, but the following were the most common: diversity committee, diversity liaison, and vice chair of DEI (Table I). For 16 (38.1%) of the 42 programs, the faculty role was nonspecific to the orthopaedic residency program. These nonspecific roles were primarily created by the affiliated school of medicine, but in 4 cases, faculty members assumed DEI roles through a medical center, a graduate medical education program, or a department of surgery. Thirty-seven of 193 (19.2%) orthopaedic surgery residency program websites listed both a diversity statement and a DEI faculty position or committee. Thirty-seven of 42 (88.1%) programs with DEI related faculty positions were university-based, with only 3 (7.1%) university-affiliated community-based programs, and 2 (4.8%) community-based programs.

Of the 155 allopathic residencies in this study, 41 (26%) had DEI faculty roles compared with only 1 (3%) of 38 osteopathic programs. Residency size was considered large or small in relation to the 22.9 average number of residents across all programs. Thirty-five of 84 (41.7%) larger residencies (with number of residents per year above 22.9 average) had DEI faculty positions while only 6 (6%) of 100 smaller residencies (with number of residents per year below 22.9 average) had similar roles. When orthopaedic residency programs were analyzed by region, the following was found: 10 of 27 (37%) programs located in the West, 13 of 52 (25%) programs located in the Northeast, 11 of 58 (19%) programs located in the South, and 8 of 55 (14.5%) programs located in the Midwest had at least one DEI faculty role.

## Discussion

The purpose of this study was to determine the number and distinct types of DEI positions within orthopaedic surgery residency programs in the United States. Of 193 orthopaedic surgery residency programs, 74 (38.3%) advocated for diversity, equity, and inclusion through DEI statements. DEI faculty positions were less common, with only 42 (21.8%) programs featuring these roles. Half of the programs with DEI statements (37 of 74) had DEI faculty roles while 5 of the 119 (4.2%) programs without similar statements had such roles. Orthopaedic surgery residency programs that had a DEI statement were 11.9 times more likely to have a DEI-related role than residency programs that did not include a DEI statement on the program website.

Of the 193 orthopaedic surgery residency programs reviewed, 16 (8.3%) of the DEI positions found were nonspecific to the residency program. Even if nonexclusive to the orthopaedic department, having an orthopaedic faculty member in a DEI position could indicate to applicants that DEI is emphasized and, may in turn, influence the recruitment of future students. These nonspecific positions were mostly created by affiliated universities (15 of 16, 93.8%), and most DEI faculty positions were at university-based programs (37 of 42, 88.1%). In addition, 3 of 63 (4.8%) university-affiliated community-based programs and 2 of 28 (7.1%) community-based programs included DEI faculty roles, as compared with 37 of 102 (36.3%) of university-based programs. A low presence of DEI faculty positions at residency programs could indicate a lack of emphasis on DEI, and this may dissuade URiM students from considering these programs.

Allopathic residencies were more likely to have DEI faculty roles, as 41 (26%) of 155 allopathic programs had such roles, compared with 1 (3%) of 38 osteopathic programs. Program size was also correlated to the presence of DEI faculty positions, with larger-than-average residencies having such roles more often (35 of 84, 41.7%) than smaller residencies (6 of 100, 6%). Orthopaedic residencies located in the West were most likely to have DEI faculty positions with 10 of 27 (37%), followed by the Northeastern region with 13 of 52 (25%) residencies with these roles. Eleven of 58 (19%) residencies located in the South and 8 of 55 (14.5%) residencies in the Midwest had at least one DEI faculty role, making Southern residencies the least likely to have DEI faculty positions.

Cohen et al. evaluated 187 orthopaedic surgery residency websites for the presence of 12 elements that represented a commitment to diversity and inclusion<sup>11</sup>. One of the elements the authors analyzed was “diversity councils,” and they found 15 (8.0%) orthopaedic residency programs included such councils. The authors also found that the average orthopaedic surgery residency program website had  $4.9 \pm 2.1$  diversity and inclusion elements<sup>11</sup>, whereas our study found that 74 (38.3%) orthopaedic residencies advocated for diversity, equity, and inclusion through DEI statements.

When comparing our data with general surgery, a surgical specialty with a higher number of female and URiM residents/practicing surgeons, orthopaedics displayed a higher number of DEI statements on their residency websites. Driesen

et al. found that general surgery residencies included  $2.7 \pm 1.5$  diversity elements on program websites<sup>12</sup>. While Mortman et al. in 2020 analyzing general surgery residencies showed that of the 403 residency program websites evaluated, only 18.6% (75 of 403) had diversity and inclusion-related information<sup>13</sup>. This study highlights that even with a lower percentage of general surgery residency website's promoting DEI, general surgery residencies attract more URiM applicants<sup>8</sup>. Notably, a recent study by Sutherland et al. demonstrated that female applicants to both general surgery and orthopaedic surgery residencies match at a higher rate than their male counterparts, yet comprise less of the applicant pool<sup>14</sup>. Given that female applicants have a higher likelihood of matching into orthopaedic residencies, promoting DEI on residency program websites may help increase the total number of female applicants and thereby female residents per program.

Studies have called for a greater number of DEI positions and committees in orthopaedic residencies because of the lower match rate of URiM applicants, and the literature has shown that diversity among orthopaedic faculty members has led to a greater likelihood of recruiting female medical students into orthopaedics<sup>15,16</sup>. The same holds true regarding URiM medical students<sup>17,18</sup>. In fact, orthopaedic residency programs with a higher percentage of URiM faculty members have been shown to have an increased percentage of URiM residents<sup>18</sup>. Alternately, when applying for residency, the presence of a specific role dedicated to DEI may also attract women and URiM applicants to a residency program.

There are several limitations to this study. First, some programs may have lacked a functioning website at the time of data collection. Second, the program websites may not have included all the information related to diversity focused statements and positions within that department. Third, the websites

may not have been up to date, or some programs may simply not publicize their DEI faculty positions on their websites. FREIDA Online comprises self-reported data from residency programs and is updated 3 times a year. Since the data collection window for this study was before the first of these updates in 2022, the data presented here are representative of the field of orthopaedics in the 2021 to 2022 academic year.

## Conclusion

Less than half of orthopaedic surgery residency programs currently advocate for DEI on their associated websites while fewer than 25 percent have a DEI faculty position. Previous studies have called for a greater number of DEI positions and committees among orthopaedic residencies because of the lower admittance rate of qualified URiM applicants. A role specifically dedicated to DEI may increase the number of women and URiM applicants pursuing a career in orthopaedic surgery. ■

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