

General

Brief Report

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Geographical distribution of osteopathic urology residents and match trends in the United States

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Abstract

Context: Applying into urology residency is highly competitive. Disparities in osteopathic (Doctor of Osteopathic Medicine [DO]) representation exist within the current urology workforce.

Objectives: This study aimed to examine the number of DO graduates in urology residency programs over time and map their current distribution throughout the United States.

Methods: All US urology residency programs for the 2023–2024 academic year were identified, and residents' post-graduate year and degrees, and the program's states, were collected from each program's websites. DO residents were stratified by their postgraduate years to observe the trends in the number of urology residents over the past 5 years. Their geographical distribution was evaluated. The number of DO urology residents per state and their ratio among all urology residents per state were examined.

Results: Among 135 urology residency programs analyzed, 1753 urology residents were identified. Ninety-nine residents hold a DO degree from a total of 39 urology programs (28.9 %). The number of DOs that matched into urology has been steadily increasing from 15 in 2019 to 26 in 2023 ($R^2=0.8556$, $p=0.0244$). Michigan had the greatest number of

DO urology residents ($n=35$). Pennsylvania ($n=10$, 7.81 %) and South Carolina ($n=10$, 40 %) had the second highest. Illinois ($n=7$, 7.14 %) had the third highest. More than half of the states with urology residency programs had no DO residents ($n=27$, 62.8 %).

Conclusions: Osteopathic medical training plays an important role in the urology workforce, and there is an increased recognition of DOs within urology residency programs in the United States. In the era of urologist shortages, efforts to support the contributions of DOs in underserved and rural communities may have a profound impact in this field.

Keywords: holistic; match; residency; state; surgical training; urology

Urology continues to be a highly desired specialty, with increasing competitiveness, as demonstrated by the average match rate of 76 % from 2015 to 2025 [1]. Disparities in osteopathic (Doctor of Osteopathic Medicine [DO]) representation in urology exist in the current urology workforce today. About 11 % of physicians in the country are DOs, and that number is rapidly expanding. DO graduates from all osteopathic medical colleges has increased 64 % in the past decade; however, only approximately 2.6 % of urologists are DOs, highlighting a disparity, particularly relevant given an increasing urologist shortage [2, 3]. To the same extent, international medical graduates (IMGs) applying for a urology residency program exhibit significant barriers as well. From a recent study on the geographical distribution of IMGs in urology training in the 2022 academic year, results indicated that there is a decline in IMG matching into urology between 2017 and 2022 [4]. Thus, there is a noted gap in the diversity of the current urology workforce. Although this gap is closing, it is crucial to determine the current trends because they may help influence future DO medical students in their preclinical years to find adequate mentorship in urology. A study found that urology mentorship during the preclinical years is very important [5]. Interestingly, over 75 % of DO institutions lack affiliated home urology programs; thus, early access to urology exposure remains a challenge for many DO students [6].

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Given the growing competitiveness of the American Urological Association (AUA) match, the aim of this study is to examine the number of DO graduates in urology residency programs over time and map their current distribution throughout the US. We hypothesize that there is growth in the number of DO urology residents over time, however, DO residents are localized to certain regions and programs.

Methods

The analysis of the current trends of DO urology residents followed similar prior studies examining IMG urology residents, DO neurosurgery residents, and DO general surgery residents [4, 7, 8]. This study was exempt from Institutional Review Board (IRB) approval.

All US urology residency programs provided by the AUA for the 2023–2024 academic year were identified in October 2023 [9]. Additional AUA match outcomes during the 2024 and 2025 match were retrieved from publicly available AUA data [1, 10]. The complement of residents including their postgraduate year and degrees, and the program's states, were collected from each program's websites in line with a recent report's methodology. Websites with up-to-date resident information were included. Up-to-date information was confirmed by either indication of the current academic year or by being cross-referenced with publicly available data online from reporting of a resident's graduation year or professional profile via LinkedIn, Doximity, or X. DO residents were stratified by their postgraduate years to observe the trends in the number of urology residents over the past 5 years and analyzed with linear regression. Their postgraduate years were utilized to ascertain unknown historical DO match data in urology. Their geographical distribution across the United States was also evaluated. The number of DO urology residents per state, and their ratio among all urology residents (MD and DO) per state, were examined. A choropleth of DO urology residents by state was generated utilizing Google Sheets. States without urology residency programs and those without current website information were incompatible for analysis. Descriptive statistics were utilized to analyze resident counts, while regression analysis was performed to assess match trends over time. All statistical analyses were conducted utilizing GraphPad Prism 10. A p value of <0.05 was considered significant.

Results

Out of 151 urology programs, 135 met the inclusion criteria for analysis in this study. A total of 1753 urology residents

were identified. The majority ($n=1,654$, 94.4 %) held a MD degree. Two residents (0.1 %) held a Bachelor of Medicine, Bachelor of Surgery (MBBS) degree. Ninety-nine residents (5.5 %) were found to hold a DO degree, from a total of 39 urology programs (28.9 %).

The number of DOs that matched into urology has been steadily increasing from 15 in 2019 to 30 in 2025 ($R^2=0.8438$, $p=0.0035$), and the DO match percentage has been steadily increasing from 4.4 % in 2019 to 7.4 % in 2025 ($R^2=0.79$, $p=0.0075$) (Figure 1A and B). The number of urology residency positions offered according to the AUA has also been significantly increasing, from 339 in 2019 to 403 in 2025 ($R^2=0.9738$, $p<0.0001$) (Figure 1C). Additionally, the number of programs having new DO urology residents has been significantly increasing, from 12 in 2019 to 20 in 2023 ($R^2=0.7908$, $p=0.0435$) (Figure 1D).

Figure 2 depicts the geographical distribution of DO urology residents. Among all urology residents (MDs and DOs) by state, South Carolina had the highest proportion of DO urology residents ($n=10$, 40 %). Michigan had the second highest proportion of DO urology residents ($n=35$, 33.65 %), followed by Vermont ($n=1$), West Virginia ($n=2$), and Arkansas ($n=2$), each with 20 %. When looking at the total number of DO urology residents by state, Michigan had the greatest number ($n=35$). Pennsylvania ($n=10$, 7.81 %) and South Carolina ($n=10$, 40 %) had the second highest. Illinois ($n=7$, 7.14 %) had the third highest. More than half of the states with urology residency programs had no DO residents ($n=27$, 62.8 %).

There are 11 former American Osteopathic Association (AOA)-accredited urology residency programs across five states. A greater number of DO urology residents in the 2023–2024 academic year were observed to be training in these programs (Figure 2).

Discussion

This is the first study to report where DO urology residents train in the United States. Prior to the AUA match in 2024, the data regarding DO match were unknown, because the AUA had not released this historical data. Out of 385 spots in 2024, 35 DOs matched into urology, equating to 57 % of DO applicants [1]. In contrast, 331 MDs matched into urology, equating to 84 % of MD applicants. In the 2025 AUA match, 54 % of DO applicants matched, whereas 83 % of MD applicants matched [10]. Although it is not expected that the number of DO urology residents should equal that of MDs due to the greater number of MD graduates applying compared to DO graduates, the matched percentage differs significantly between these two groups. Despite this gap, it is

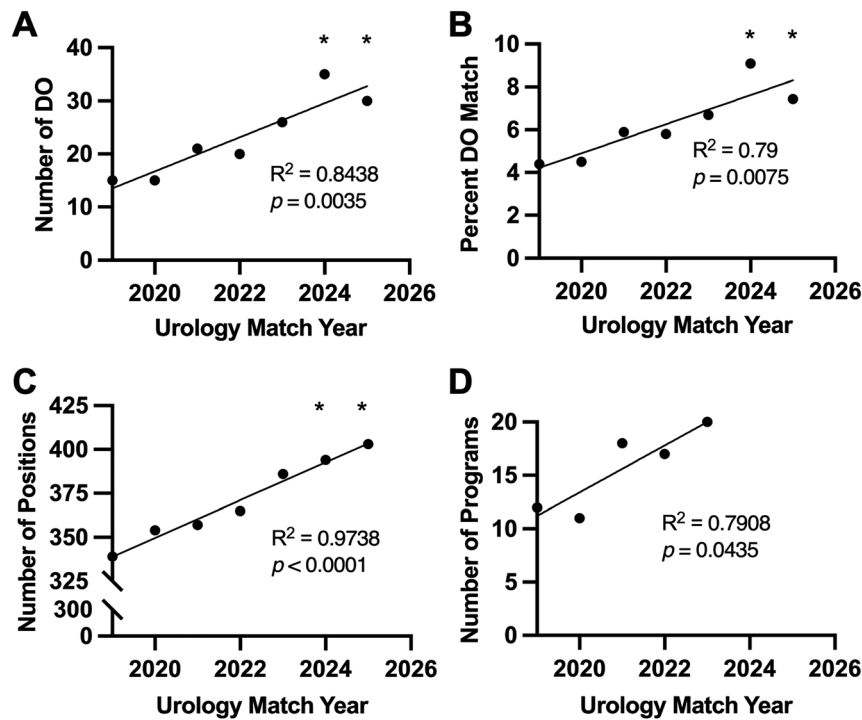


Figure 1: Urology match trends from 2019 to 2025. (A) Number of DOs who match into urology. (B) The percentage of DOs who match into urology. (C) The total number of urology residency positions available according to the American Urological Association (AUA) match data. (D) The trend of the number of urology programs having DO residents in the past 5 years. (*) Denotes data retrieved from publicly available 2024 and 2025 AUA match data.

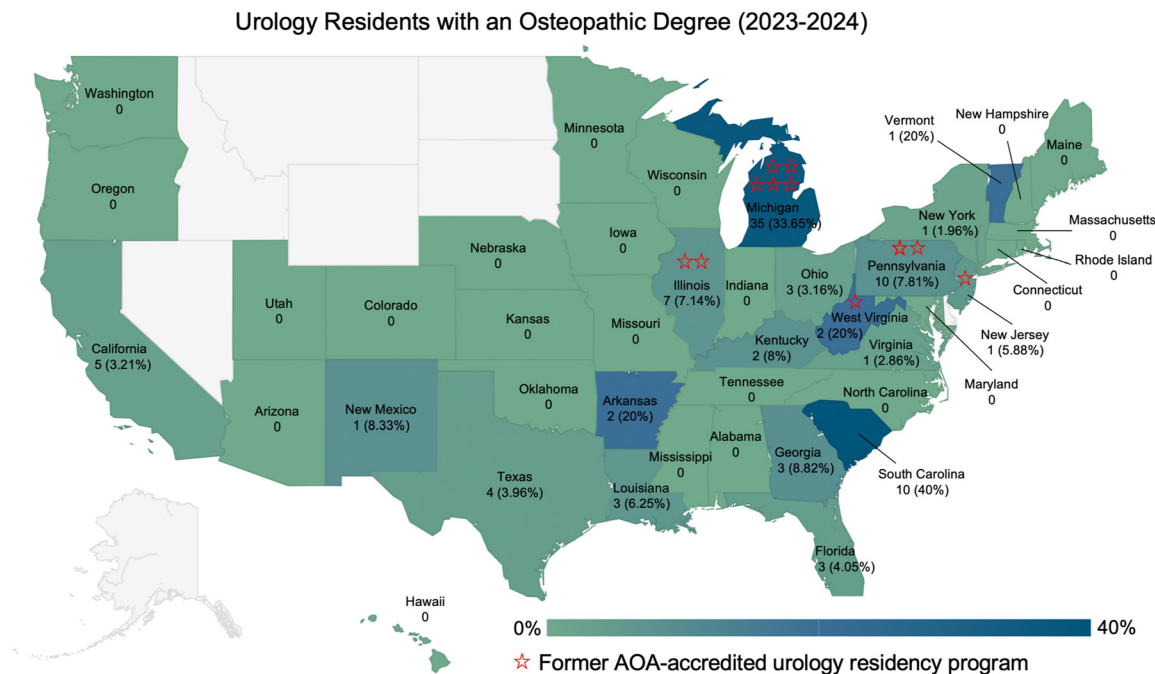


Figure 2: Geographical distribution of DO urology residents for the 2023–2024 academic year. Due to data availability, Alaska, Idaho, Nevada, Montana, Wyoming, North Dakota, and South Dakota were incompatible for analysis. DO representation among urology residents per state reported as the total number or a proportion. Values labeled as n (%). Red star denotes a former AOA-accredited urology residency program.

important to recognize the progress that DOs have made in the field of urology over time.

DOs and their holistic approach to training play an important role in the urology workforce [6]. A consistent

increase in the number of DOs successfully matching into urology residency over the past 5 years signifies an increase in the number of candidates whose personal qualifications meet the requirements of open slots. It also indicates that

there is a growing recognition and acceptance of DOs within urology, contributing to the diversification of the urologic practice. It emphasizes a commitment to expanding training opportunities for aspiring DO urologists. A recent similar study examining DO general surgery residents highlight comparable trends over the years [7].

On the contrary, our study highlights disparities in the geographic distribution of DO urology residents across different states. Although certain states exhibit higher proportions of DOs, others show lower representation, highlighting potential regional polarities in access to urology training opportunities for DOs. Findings suggest that historical patterns of DO urology training locations are reflective in the current landscape. Further, the percentage of DOs urology residents currently training remain under 10 %. Knowledge of where most DO urology residents are located can empower DO students to make informed decisions about regions to which they apply, thereby enhancing their chances of successfully matching. Further studies could be conducted to characterize the geographic location of medical schools attended by DO students pursuing urology and the residency programs to which they ultimately match.

Further, it is important not only for current DO urologists to advocate for DO medical student, especially through mentorship and research to help expand and diversify the specialty, but also for MD urologists to recognize the challenges that DO students face in gaining urology exposure, fostering a collaborative effort to eliminate the prevailing bias. Recently, one study examining DO medical students found that there is high interest among DO preclinical students in urology [5]. Among DO students who are interested in urology, there was a significantly greater interest in early urology exposure and a urology mentorship program as opposed to extracurricular urology-related workshops. Efforts to increase such opportunities for DO engagement at the AUA annual meetings and section meetings may result in positive trends in DO residents entering programs in the central and western United States.

A limitation of this study is that it captures data from only a single academic year, meaning that these findings do not account for programs that have previously had DO urology residents. Therefore, a follow-up study in 3 years may be helpful to determine whether these trends remain unchanged. Additionally, given that our study is observational, we are unable to determine causal relationships regarding why DO residents are training in certain locations. Success in matching into urology is multifactorial and depends on additional factors such as board scores, research experiences, and letters of recommendation, which we were unable to assess in parallel with our findings.

Conclusions

Overall, there is an increased recognition of DOs within urology residency programs in the United States. This growing inclusion can contribute to a more equitable and diverse urology workforce. Ultimately, the slow increase in the number of urology residency positions in the United States contributes to the concerning urologist shortage. There is significant opportunity for DO urologists to improve the current gap in urologic care within rural and underserved communities, because many DO medical school training programs emphasize serving these populations.

Research ethics: This study is deemed exempt from IRB approval.

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