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Carolina Gomez

Rachel Ranson

Arianna Gianakos

Cadence Miskimin

Mary K Mulcahey

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Allopathic and Osteopathic Residents Perform Similarly on the Orthopedic In-Training Examination (OITE)

Carolina Gomez*, Rachel Ranson, DO, MS,[†] Arianna Gianakos, DO,[‡] Cadence Miskimin, MS,[§] and Mary K. Mulcahey, MD[§]

*Tulane University School of Science and Engineering, New Orleans, Louisiana; [†]The George Washington University Hospital, Washington, DC; [‡]Department of Orthopaedic Surgery, Harvard-Massachusetts General Hospital, Boston, Massachusetts; and [§]Department of Orthopaedic Surgery, Tulane University School of Medicine, New Orleans, Louisiana

INTRODUCTION: There is a bias in the medical community that allopathic training is superior to osteopathic training, despite the lack of substantiation. The orthopedic in-training examination (OITE) is a yearly exam evaluating educational advancement and orthopedic surgery resident's scope of knowledge. The purpose of this study was to compare OITE scores between doctor of osteopathic medicine (DO) and medical doctor (MD) orthopedic surgery residents to determine whether any appreciable differences exist in the achievement levels between the 2 groups.

METHODS: The American Academy of Orthopedic Surgeons 2019 OITE technical report, which reports the scores from the 2019 OITE for MDs and DOs, was evaluated to determine OITE scores for MD and DO residents. The progression of scores obtained during various post-graduate years (PGY) for both groups was also analyzed. MD and DO scores throughout PGY 1–5 were compared with independent t-tests.

RESULTS: PGY-1 DO residents outperformed MD residents on the OITE (145.8 vs 138.8, $p < 0.001$). The mean scores achieved by DO and MD residents during PGY-2 (153.2 vs 153.2), 3 (176.2 vs 175.2), and 4 (182.0 vs 183.7) did not differ ($p = 0.997, 0.440, \text{ and } 0.149$, respectively). However, for PGY-5, the mean scores for MD residents (188.6) were higher than those of DO residents (183.5, $p < 0.001$). Both groups had trends of improvement seen throughout PGY 1 to

5 years, with both groups showing an increase in average PGY scores when compared to each preceding PGY.

CONCLUSION: This study provides evidence that DO and MD orthopedic surgery residents perform similarly on the OITE within PGY 2 to 4, thus displaying equivalencies in orthopedic knowledge within the majority of PGYs. Program directors at allopathic and osteopathic orthopedic residency programs should take this into account when considering applicants for residency. (J Surg Ed 000:1–6. © 2023 The Author(s). Published by Elsevier Inc. on behalf of Association of Program Directors in Surgery. This is an open access article under the CC BY license

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KEY WORDS: orthopedic in-training examination, resident education, oite, allopathic residents, osteopathic residents, stigma

COMPETENCIES: Medical Knowledge, Practice-Based Learning and Improvement, Patient Care

INTRODUCTION

Both osteopathic (DO) and allopathic (MD) medical educations consist of a 4-year curriculum that focuses on a framework of biomedical science, clinical science, and health system science.¹ Osteopathic medical education also integrates an additional 200 to 250 hours of musculoskeletal education focused on learning an additional skill called osteopathic manipulative treatment (OMT). OMT is a distinctive modality commonly used by DOs to complement conventional management of musculoskeletal disorders.² Despite the many similarities between

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Correspondence: Inquiries to Mary K. Mulcahey, MD, Department of Orthopaedic Surgery, Tulane University School of Medicine, 1430 Tulane Avenue, #8632 70112, New Orleans, LA; e-mail: mary.mulcahey.md@gmail.com

osteopathic and allopathic medical education, some members of the medical community have stigmatized osteopathic medicine and have disparaged or discredited osteopathic education. This stigma circulates throughout the medical environment and leads to a discrepancy in the treatment of DOs and MDs that persists past medical school training and into residency and medical practice.³

Historically, the American Osteopathic Association (AOA) and the American Council for Graduate Medical Education (ACGME) were the 2 governing bodies overseeing graduate medical education. These programs facilitated 2 distinct matching processes for DOs and MDs, respectively. The separation of these 2 programs created a divide that further isolated MDs and DOs. Over the past several years, the AOA and ACGME have worked to achieve unity and consistency by creating a single accreditation system through the National Residency Match Program.⁴ With the creation of this system, the majority of AOA accredited residency programs that were once solely available to DO students are now accredited by the ACGME. MD and DO medical students are now able to apply to the same pool of orthopedic residency programs under the National Residency Match Program Match.⁵

The orthopedic in-training examination (OITE) is an annual exam that is given to all orthopedic surgery residents in the United States during postgraduate years (PGY) 1 to 5. This exam was created to evaluate each orthopedic residency program and determine whether and how well it is attaining its educational goals. The exam is intended to evaluate the level of knowledge of residents throughout their training.⁶ The purpose of this study was to compare OITE scores between DO and MD orthopedic surgery residents to determine whether any appreciable differences exist in the achievement levels between the 2 groups.

METHODS

The American Academy of Orthopedic Surgeons (AAOS) develops, administers, scores, and reports the OITE. The AAOS released an OITE technical report in 2019, which presents and compares the scores from the 2019 OITE for residents from ACGME accredited orthopedic surgery residency programs ($N = 3797$), Canadian residency programs ($N = 280$), international residency programs ($N = 423$), and AOA programs ($N = 610$).⁷ For the purpose of this study, the 2 groups analyzed were the ACGME and AOA accredited orthopedic surgery residency programs.

Since ACGME programs are comprised mostly of MD residents and AOA programs are comprised mostly of

DO residents, these 2 groups represent MD orthopedic surgery resident scores and DO resident scores, respectively.⁴ Since the implementation of a single accreditation system in 2020, the scores from the 2019 OITE results are the last results that present these as separate groups. The 2019 technical report also further separates these groups into PGY 1 to 5 and provides mean score, number of test takers, and standard deviation for each group within the respective PGY 1 to 5 years (Table 1).

Information from the 2019 OITE Technical Report was further analyzed and compared. The mean scores from the ACGME residents were compared to the mean scores for AOA residents for each PGY 1 to 5. Group comparisons were made using independent/unpaired *t*-tests for each PGY (GraphPad Software, Inc., San Diego, CA). Descriptive statistics were analyzed using Microsoft Excel (Microsoft Corporation, Redmond, WA). *p*-values were considered statistically significant at 0.05.

RESULTS

Analysis of the mean scores from the 2019 OITE showed that DO residents had a higher score than MD residents for PGY-1 (145.8 vs 138.8, $p < 0.001$) (Table 1, Fig. 1). The mean scores achieved by DO and MD residents during PGY-2 (153.2 vs 153.2), 3 (176.2 vs 175.2), and 4 (182.0 vs 183.7) did not differ ($p = 0.997$, 0.440, and 0.149, respectively) (Table 2, Fig. 1). However, for PGY-

TABLE 1. Overall Mean OITE Scores for Orthopedic Surgery Residents Across All Postgraduate Years

		N	Mean	SD	SE
PGY 1	ACGME residents (PGY1)	755	138.84	15.37	0.559
	Osteopathic residents (PGY1)	121	145.75	14.74	1.34
PGY 2	ACGME residents (PGY2)	785	153.18	28.75	1.03
	Osteopathic residents (PGY2)	120	153.17	34.28	3.13
PGY 3	ACGME residents (PGY3)	773	175.18	13.39	0.482
	Osteopathic residents (PGY3)	125	176.18	13.66	1.22
PGY 4	ACGME residents (PGY4)	749	183.72	12.27	0.448
	Osteopathic residents (PGY4)	121	181.98	12.47	1.13
PGY 5	ACGME residents (PGY5)	735	188.57	11.60	0.428
	Osteopathic residents (PGY5)	123	183.45	12.68	1.14

OITE, orthopedic in training examination; ACGME, American Council for Graduate Medical Education; PGY, postgraduate year; SD, standard deviation; SE, standard error.

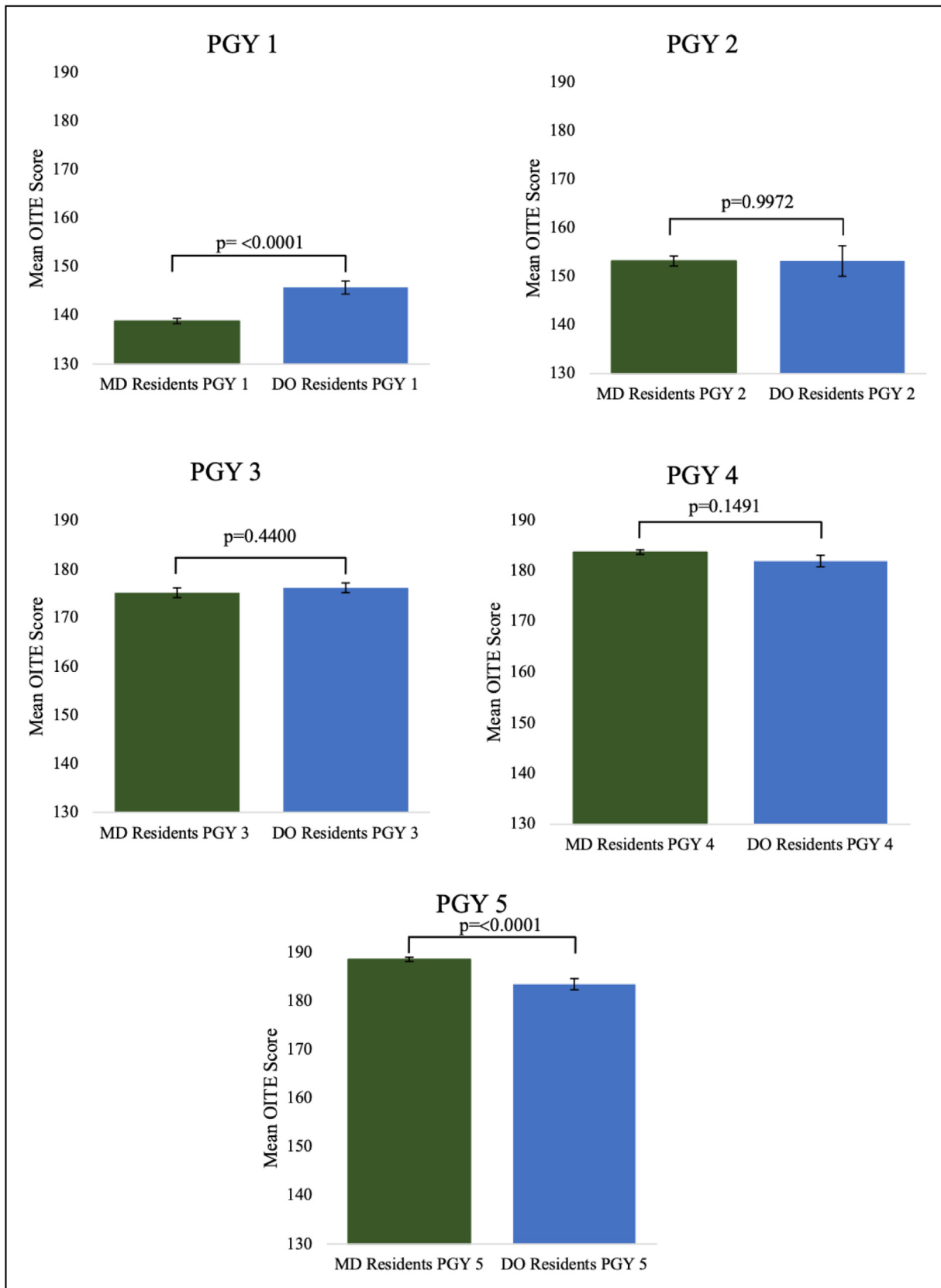


FIGURE 1. Comparison of mean MD and DO scores for each PGY. MD, allopathic; DO, osteopathic; PGY, postgraduate year; OITE, orthopedic in-training examination.

TABLE 2. Results for Individual Unpaired T-Tests for Each Postgraduate Year

PGY	T-Value	df	Two-Tailed p Value
PGY 1	4.6166	874	<0.0001
PGY 2	0.0035	903	0.9972
PGY 3	0.7725	896	0.4400
PGY 4	1.4441	868	0.1491
PGY 5	4.4691	856	<0.0001

PGY, postgraduate year; *df*, degrees of freedom.

5, the mean scores for MD residents (188.6) were higher than those of DO residents (183.5, $p < 0.001$) (Table 1, Fig. 1).

When the mean scores for MD and DO residents throughout PGY 1 to 5 were plotted on the same graph along with their confidence intervals, a joint progression in scores is observed (Fig. 2). The scores for both groups increase with each PGY. Similar to the findings discovered through the t-test, the only PGYs in which there is no overlap in the confidence intervals of the 2 groups

are PGY-1 and PGY-5. Even when there was a statistically significant difference between the 2 groups, both groups had trends of improvement seen throughout PGY 1 to 5 years.

DISCUSSION

This study evaluated OITE scores for MD and DO orthopedic surgery PGY 1–5 residents prior to the ACGME residency merger. The most significant findings are that there were higher mean scores on the OITE during PGY-1 for residents from osteopathic versus allopathic programs. No significant difference was found between the mean scores of these 2 groups for PGY 2 to 4. For PGY-5, the mean score for the MD residents was higher than for the DO residents. This study also identified a similar improvement of OITE scores with both DO and MD residents over years 1 through 5. Ultimately, these findings demonstrate that these 2 groups of orthopedic residents achieved very similar scores, with only 2 out of the 5

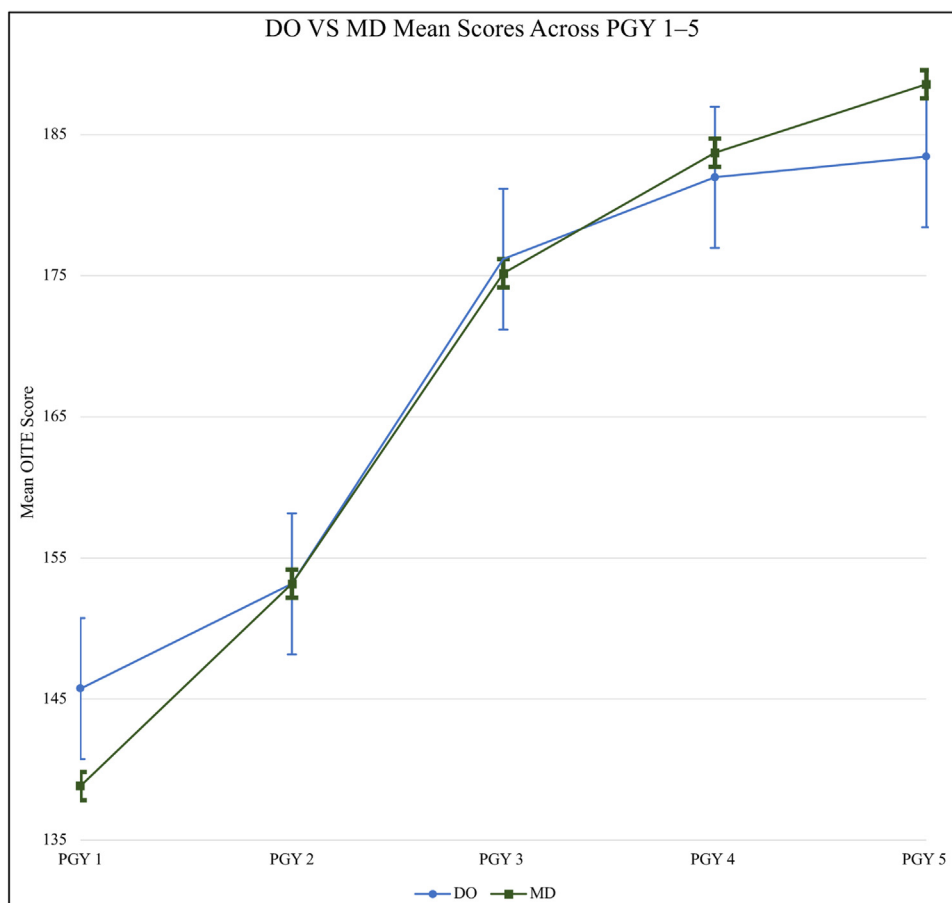


FIGURE 2. MD and DO mean OITE scores compared over PGY 1–5 including standard error. MD, allopathic; DO, osteopathic; PGY, postgraduate year; OITE, orthopedic in-training examination.

PGYs showing a significant difference in OITE scores between the 2 groups.

The high scores attained on the OITE during PGY-1 by DO residents could possibly be attributed to the 200 to 250 extra hours of musculoskeletal education that is integrated into DO training, which focuses on implementing OMT. Even though OMT is centered around osteopathic principles, a small number of allopathic residencies attempt to incorporate OMT into their programs.⁸ The findings of this study could not verify whether the extra hours of musculoskeletal education or other factors incorporated into DO training are solely responsible for the difference in scores observed during PGY 1.

No discrepancy in the mean OITE scores was found among PGY 2 to 4 orthopedic surgery residents, which speaks to the similarity in curriculum and academic training in the DO and MD orthopedic residency programs. We also found a similar progression of scores for both groups throughout all PGY levels; however, MDs outperformed DOs on the OITE in the final year of residency training. Although there is no concrete evidence as to why this discrepancy may exist in the final year of training, it may be due to differences in study habits or program offerings within the final PGY which may result in higher OITE scores. In addition, future studies are necessary to determine if there are differences in the clinical workload and call schedules during the PGY-4 and PGY-5 years, which can also contribute to discrepancies in OITE scores. The comparable OITE scores between DO and MD residents suggest that the orthopedic knowledge obtained during residency training is similar. However, it is difficult to know whether a resident will do better in 1 program versus another.

A previous study that analyzed the performance of DO and MD physicians on the American Board of Physical Medicine and Rehabilitation initial certifying examinations reported similar findings. The study concluded that there were no meaningful differences in performance between MDs and DOs on the American Board of Physical Medicine and Rehabilitation certifying examinations.⁹ Another study that compared levels of Basic Science knowledge between MD and DO medical students presented similar conclusions as well. The study utilized an examination constructed to assess basic science knowledge and administered it to MD and DO medical students. This study concluded that the same basic science knowledge is expected for DO and MD students.¹⁰ Although both of these studies compare performance of MD and DO physicians within different specialties and/or years of training, these studies offer insight into the similar performance patterns of MD and DO physicians.

It is unclear where the stigma that DOs are lesser than MDs originated. One thought is that since there are

historically fewer DO physicians compared to MDs, it makes them less credible. This may also contribute to many people not knowing what a DO physician is, simply due to lack of exposure. However, the number of osteopathic physicians in the U.S. has reached nearly 135,000, which represents an 80% increase over the past decade.¹¹ Even though most historical medical colleges in the US are MD schools, the rapid growth of DO physicians is closing the gap between the number of MD and DO physicians.

Apart from the predispositions relating to the lack of DO physicians in the medical field, another factor that possibly furthered this stigma was the previously used separate match process. The separation of these programs presented a divide that most likely furthered the aforementioned stigma and degraded the creditability of DOs when compared to MDs. Currently, almost all DO and MD residency programs are now part of a single accreditation system, which facilitates 1 matching process for both MD and DO medical students.

There are several limitations to this study. The data in this study were obtained from the 2019 OITE Technical Report, which is publicly accessible. This report offers general statistics from the 2019 OITE. However, the raw data were not provided. Without the raw data, comparisons could only be made from the provided means. The results are also limited by the amount and type of data that are available. The 2019 OITE technical report is the only report that is currently available from the AAOS that does not group the MD and DO residents under the same category. The publicly available OITE technical report from 2020 groups both MD and DO residents into 1 category and would not allow for analysis of the data from both groups without the raw data.

CONCLUSION

This study provides evidence that DO and MD orthopedic surgery residents perform similarly on the OITE within PGY 2-4, thus displaying equivalencies in orthopedic knowledge within the majority of PGYs. Program directors at allopathic and osteopathic orthopedic residency programs should take this into account when considering applicants for residency.

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