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An Evaluation of Off-Service Rotations in Podiatric Medicine and Surgery Residency Training

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ABSTRACT

Residency training in podiatric medicine and surgery includes 3 years of comprehensive training. Complementing their podiatric medicine and surgery training, residents complete a series of required nonpodiatric, or off-service, rotations in a range of specialties. However, there has been a lack of formal investigation of these off-service rotation experiences. An online survey was developed and distributed to both program directors and residents nationwide. The survey instrument covered various aspects of off-service rotations, including rotation value, length, goals and objectives, activities, feedback, and resident satisfaction. In total, 122 of 222 directors responded and 151 of 243 residents responded. Resident responses reflected the impact of podiatric responsibilities during off-service rotations and the importance of hands-on, interactive, and dedicated learning opportunities during these rotations. Both similarities and differences were appreciated with regard to perceived rotation value between resident and director perspectives. Perceived satisfaction of certain rotations was correlated with rotation length, feedback, specific rotation activities, and whether residents received goals and objectives. Though perhaps neglected, the off-service rotation experience is an important part of the podiatric medical and surgical residency experience. Considering the perspectives of both directors and residents can be helpful in directing these experiences and in considering future changes.

Residency training in the field of podiatric medicine has undergone significant change, evolving to a standard of 3 rigorous years of combined medical and surgical training. Currently, residency programs in podiatric medicine are regulated by the Council on Podiatric Medical Education (CPME). The CPME dictates the standards and requirements of these residency programs, collated in the online-accessible document "CPME 320" (1).

Document CPME 320 carefully describes details related to the podiatric medicine and surgery residency. While this includes a great deal of content related to podiatric surgical training, the document also describes requirements related to nonpodiatric, or off-service, rotations. These rotations include medical imaging, pathology, behavioral sciences, internal medicine/family practice, infectious disease, general surgery, surgical subspecialties, anesthesiology, and emergency medicine. Rotations in 2 of the following medical subspecialties are required as well: dermatology, endocrinology, neurology, pain management, physical medicine and rehabilitation, rheumatology, wound care, burn unit, intensive/critical care unit, pediatrics, and geriatrics. In total, these rotations can constitute a considerable part of the podiatric residency experience; although the amount of dedicated time varies by program.

Recent research explored the residency experience in podiatric medicine and surgery, describing the perspectives of both program directors and residents (2). Conducted via an electronic survey, topics explored included surgical case requirements, duty hours, podiatric learning resources, student externships, noncognitive residency traits, and resident/director satisfaction. Notably absent from this study, however, was an investigation of off-service rotations.

While these rotations are required, limited information is available with regard to how to best conduct these rotations. The purpose of the present study is to investigate the off-service rotation experience. By portraying the perspectives of both directors and residents, the goal is to help program directors improve these rotations for their residents.

Materials and Methods

An electronic survey was designed by using Qualtrics® (https://www.qualtrics.com/), an online survey tool. Both closed-ended and open-ended questions were used in the survey. Completion of closed-ended questions was compulsory and completion of open-ended questions was optional. A single survey was constructed, with conditional

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branching used to appropriately direct questions to either resident or program director questions. Conditional branching was also used to ensure that residents would only receive follow-up questions for rotations that they had self-identified as having already completed. To verify the internal reliability of the survey construct, feedback was solicited from 10 podiatric medical and surgical residents and recent graduates as well as 10 program directors. The survey of both directors and residents was finalized after incorporation of this feedback. Edits to the survey were considered as feedback was generated. All survey changes considered were reviewed with each of the authors and then discussed with the cohort of directors, residents, and recent graduates reviewing the survey. Feedback was used to best represent residency training experiences during off-service rotations, with especially valuable feedback from those who had recently completed the rotations being evaluated. The survey revision process was completed during a 1-month period. The survey began with a brief informed consent and institutional review board approval was obtained before survey delivery. Question topics included rotation value, length, goals and objectives, activities, feedback, and resident satisfaction. The 2 finalized surveys are presented as Appendices A and B. Note that conditional branching was integrated into the online survey; therefore, residents were presented far fewer questions than are present in the survey.

The survey was sent electronically to all current program directors listed on the Central Application Service for Podiatric Residencies website (3). Program directors were asked to forward the link to their current residents. The survey was sent in early June 2017, followed by 2 reminder emails. After 3 weeks, the survey was closed.

Data analysis was performed by using an independent unpaired t test for all continuous variables and a χ^2 test for all categorical variables. Pearson correlations were used to determine if individual item responses were significantly correlated with resident satisfaction. Statistical significance was defined at the 5% ($p \leq .05$) level.

Results

The survey was distributed to 222 program directors, and there were 122 (55.0%) responses. There were 243 residents who received the survey, with 151 (62.1%) responses. Of the resident respondents, 39.7% were first-year residents, 33.1% were second-year residents, and 27.2% were third-year residents.

Representative comments from the open-response portion of the surveys were collected (Appendix A). Themes included the varying resident experiences during rotations, the impact of podiatric responsibilities during off-service rotations, and the importance of hands-on, interactive, and dedicated learning opportunities during the rotations. Director responses were generally more varied and reflected the issues affecting these rotations from the perspective of the program director.

Directors were asked to identify the value of each required and elective rotation, while residents were asked to identify the value of the rotations they had already completed. Among directors and residents, the highest-ranked required rotation was infectious disease and the lowest-ranked required rotation was behavioral science (Fig. 1). Among both directors and residents, the highest-ranked elective rotation was wound care/limb salvage. The lowest-ranked elective rotation among directors was intensive care unit/critical care, while among residents the lowest-ranked elective rotation was physical medicine and rehabilitation (Fig. 2). Anesthesiology, emergency medicine, medical imaging, and general surgery rotations were considered more valuable by directors than by residents, with statistical significance (Table 1). Also with statistical significance, the endocrinology rotation was considered more valuable by residents than by directors (Table 1).

The length of individual rotations ranged from 2.44 to 5.39 weeks, with an average of 3.62 ± 0.99 weeks (Table 2). Residents self-identified receiving goals and objectives before beginning their rotations for an average of 76.88% of rotations; although directors reported providing goals and objectives an estimated 92.5% of the time. Residents reported receiving feedback before their final evaluation 80.22% of the time.

Secondary analysis was performed based on how satisfied residents were with their rotations. Combined across all of the rotations, receiving feedback before the final evaluation was found to be significantly correlated with improved rotation satisfaction ($r = 0.291$, $p < .001$). Being more prepared for rotations was also significantly correlated with improved rotation satisfaction ($r = 0.385$, $p < .001$). Preparation was especially helpful for the following rotations: ICU/critical care, plastic surgery, pediatrics, rheumatology, pathology, behavioral science, general surgery, and anesthesia (respectively, $r = 0.676, 0.619, 0.614, 0.520, 0.511, 0.437, 0.375, 0.313$; $p < .001$).

Receiving goals and objectives before the start of the rotation was found to be correlated with improved rotation satisfaction for dermatology ($r = 0.380$, $p = .042$), general surgery ($r = 0.361$, $p = .001$), behavioral science ($r = 0.336$, $p = .003$), and anesthesia ($r = 0.248$, $p = .004$) rotations. Increasing length of the rotation was found to be correlated with improved rotation satisfaction for dermatology ($r = 0.378$, $p = .043$), endocrinology ($r = 0.330$, $p = .049$), general surgery ($r = 0.269$, $p = .011$), and anesthesia rotations ($r = 0.247$, $p = .004$). Certain procedural activities specific to each rotation were found to be individually correlated with improved rotation satisfaction as well (Appendix B).

Discussion

With the focus of residency generally on experiences related to podiatric medicine and surgery, off-service rotations may be considered an aside. Still, off-service rotations have been deemed to be an important part of the residency training experience and make up a considerable portion of the time committed to residency. Considering the views of both residents and directors may be helpful in improving the off-service rotation experience. Perspectives of residents, in particular, have been documented as helpful in establishing program quality and resident satisfaction (4). The benefits of addressing off-service

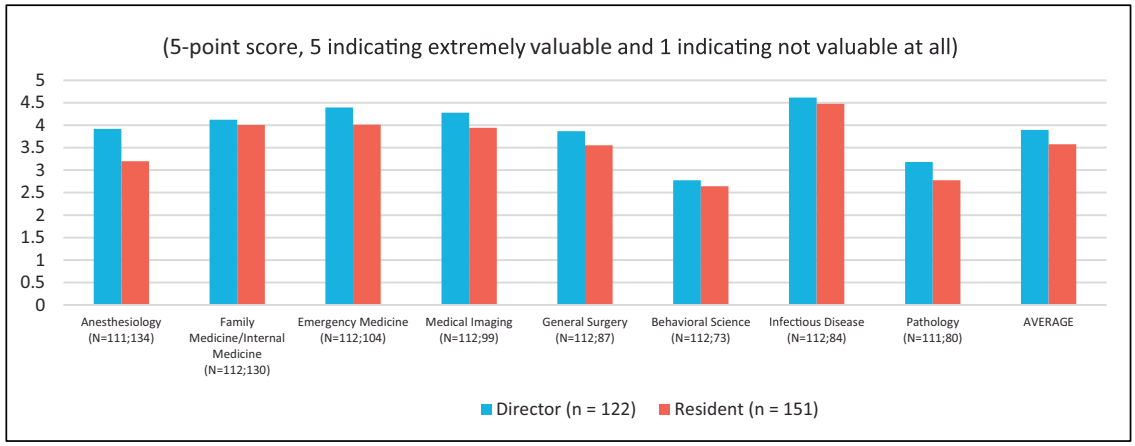

Fig. 1. Value of required rotations, and director and resident responses.

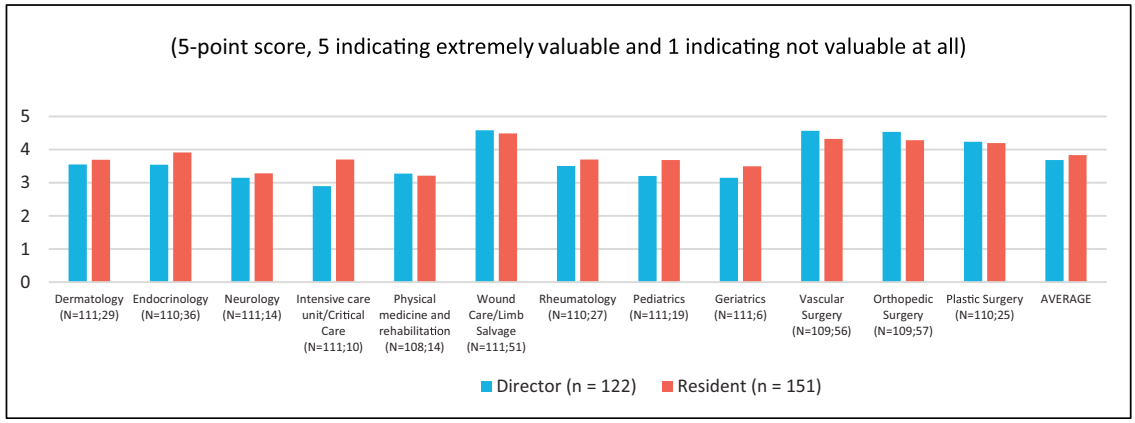

Fig. 2. Value of elective rotations, and director and resident responses. Note the variability in the number of resident respondents.

curriculum have also been explored in other fields: a series of studies in the emergency medicine literature, for example, investigated the needs, objectives, and assessment of their off-service curriculum (5–7).

Residents identified receiving goals and objectives beforehand less frequently than directors believed that goals and objectives were provided. As goals and objectives were found to influence the perceived satisfaction of certain rotations, it may be helpful to ensure that goals and objectives are distributed before an individual off-service rotation begins. Review of the process by which goals and objectives are distributed may be appropriate as well.

Residents reported receiving feedback before their final evaluation 80.22% of the time. For comparison, a comparable study involving medical residents of various programs reported that residents received feedback only before their final evaluation for 35% of their rotations (8). Nonetheless, receiving feedback in the present study was significantly correlated with improved resident satisfaction, suggesting that this may be an important consideration for program directors as well.

Program directors may use these results to help decide which specific rotations their program offers or requires. The caveat is that certain rotations are more easily available at specific programs, which was also reflected in the directors' comments. Nonetheless, certain flexibility often does exist, and internal evaluation at individual residency programs of how best to guide this decision may be appropriate. Consideration of rotation length, rotation feedback, and specific rotation activities, for example, can be helpful in directing this decision. Considering the residents' free responses may also be helpful more generally in improving the off-service rotation experience.

Limitations of this study include the varied response rate. Specifically, the number of responses for several of the less frequently completed optional rotations was lower than for the other rotations. This may have affected the reliability of the results for these specific rotations. Further, the results may have been affected by recall bias. Third-year residents completing their surveys may have had a limited recollection of rotation experiences that occurred during their first year. Furthermore, this study may have been affected by nonresponse bias. Participants in the study may have had a more pointed opinion of their off-service rotation experiences, either positive or negative, than those who elected not to complete the survey.

Table 1
Value of required rotations, and director and resident responses

	Directors (n = 122)			Residents (n = 151)			*p* Value
	Mean Score	n	SD	Mean Score	n	SD	
Required Rotations							
Anesthesiology	3.919	111	0.916	3.201	134	0.856	.001*
Family medicine/outpatient internal medicine	4.125	112	0.921	4.008	130	0.915	.355
Emergency medicine	4.393	112	0.820	4.010	104	0.818	.001*
Medical imaging	4.277	112	0.903	3.939	99	0.956	.009*
General surgery	3.866	112	1.009	3.552	87	0.937	.026*
Behavioral science	2.777	112	0.898	2.644	73	1.005	.349
Infectious disease	4.616	112	0.713	4.476	84	0.667	.164
Pathology	3.180	112	1.064	2.775	80	0.940	.005*
Elective Rotations							
Dermatology	3.550	100	0.947	3.690	29	0.849	.445
Endocrinology	3.545	99	0.940	3.917	36	0.996	.048*
Neurology	3.147	95	0.945	3.286	14	0.994	.612
ICU/critical care	2.896	96	1.051	3.700	10	1.567	.144
PM&R	3.277	94	1.111	3.214	14	1.188	.847
Wound care/limb salvage	4.586	111	0.639	4.490	51	0.758	.407
Rheumatology	3.505	101	0.867	3.703	27	0.869	.292
Pediatrics	3.204	103	1.051	3.684	19	0.749	.060
Geriatrics	3.152	99	1.082	3.500	6	0.837	.441
Vascular surgery	4.565	108	0.674	4.321	56	0.855	.067
Orthopedic surgery	4.533	107	0.744	4.281	57	0.861	.052
Plastic surgery	4.238	101	0.885	4.200	25	0.707	.844

Abbreviations: ICU, intensive care unit; PM&R, physical medical and rehabilitation; SD, standard deviation.
* Statistically significant.

Table 2
Results relating to length, goals/objectives, and feedback (n = 122 resident respondents)

	Average Rotation Length, weeks	Residents' Opinion on Rotation Length*	Frequency That Goals/Objectives Were Provided Beforehand	Frequency That Residents Were Provided Feedback Before the Final Evaluation	Respondents (N)
Required Rotations					
Anesthesiology	2.74	3.08	72.99%	70.80%	139
Behavioral sciences	2.67	3.49	75.68%	77.03%	74
Emergency medicine	3.82	3.04	77.14%	79.81%	106
Family practice/internal medicine	4.99	3.19	79.55%	87.12%	134
General surgery	3.57	3.09	76.14%	79.55%	88
Infectious disease	3.68	2.99	79.76%	88.10%	84
Medical imaging	2.52	2.98	77.45%	75.00%	102
Pathology	2.44	3.29	75.95%	76.25%	79
Optional Rotations					
Dermatology	2.63	2.93	75.86%	86.21%	29
Endocrinology	2.50	2.89	80.56%	80.56%	36
Geriatrics	4.71	3.00	100.00%	100.0%	6
Intensive care unit/critical care	4.00	3.40	100.00%	90.00%	10
Neurology	2.93	3.00	50.00%	64.29%	14
Orthopedic surgery	5.39	3.07	78.95%	89.47%	57
Pediatrics	4.00	2.95	85.00%	73.68%	19
Plastic surgery	3.96	2.88	60.00%	80.00%	25
Physical medicine and rehabilitation	2.87	2.87	73.33%	73.33%	15
Vascular surgery	3.51	2.89	71.93%	77.19%	57
Wound care/limb salvage	5.76	3.12	86.27%	92.16%	51

* Values > 3 reflect too long; < 3 reflect too short.

Future studies may consider a coordinated effort to update off-service rotation parameters and adjust off-service rotation requirements. The input of residents, residency faculty, and program directors would be valuable for such an effort.

Supplementary Materials

Supplementary material associated with this article can be found in the online version at www.jfas.org doi:10.1053/j.jfas.2018.09.026.

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