

Factors Affecting Academic Leadership in Dermatology

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Practice Points

- Leadership in dermatology is key to the future of academics.
- Opportunity for mentorship and research are the most important residency program factors leading to the graduation of future chairs/chiefs and program directors.
- The retention of residents and young faculty in academics can be aided by research and scholarly activity.

Although prior studies have examined methods by which to recruit and retain academic dermatologists, few have examined factors that are important for developing academic leaders in dermatology. This study sought to examine characteristics of dermatology residency programs that affect the odds of producing department or division chairs/chiefs and program directors (PDs). Data regarding program size, faculty, grants, alumni residency program attended, lectures, and publications for all accredited US dermatology residency programs were collected. Of the 103 programs examined, 46% had graduated at least 1 chair/chief, and 53% had graduated at least 1 PD. Results emphasize that faculty guidance and research may represent modifiable factors by which a dermatology residency program can increase its graduation of academic leaders.

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Leadership is widely recognized as a key component in the role of a physician,¹ which is especially true in dermatology, a specialty that faces severe challenges in the recruitment and retention of academic faculty.² A study of the dermatology workforce found that academic institutions are more likely to be seeking to hire new faculty² and that many dermatology residency programs often are looking to replace chairpersons (chairs) and/or chiefs.³ Although fewer dermatology residents are pursuing academic careers than careers in private practice, full-time faculty members also are leaving their academic posts. This shift is demonstrated by the younger mean age of academic dermatologists² and the increased rate of departure from academia prior to pursuing more formalized leadership roles.⁴

It has been suggested that the number of full-time faculty and number of faculty publications positively influence graduates of dermatology residency programs to pursue academic careers; however, variables affecting the likelihood of graduates of dermatology residency programs becoming academic leaders later in their career have not been well studied.³ The purpose of this study is to determine the factors that influence the development of program chairs/chiefs and program directors (PDs) of dermatology residency programs.

Methods

Data were collected from all accredited dermatology residency programs in the United States as of December 31, 2008. Residency programs that were

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started after 2004 were excluded from the study, as it was thought that these programs may not have graduated a sufficient number of residents for assessment. Military residency programs also were excluded, as graduates from these programs often do not freely choose their careers after residency.

Primary end points were the number of chairs/chiefs and PDs who had graduated from each dermatology residency program. Variables included the number of years the program had been in existence, status of the program as a department or division, number of full-time faculty members, number of residents, National Institutes of Health funding received in 2008 (<http://report.nih.gov/award/index.cfm>), Dermatology Foundation (DF) funding received (<http://dermatologyfoundation.org/rap/>), number of publications from full-time faculty members in 2008 (<http://www.ncbi.nlm.nih.gov/pubmed/>), number of faculty lectures given at annual meetings of 5 societies in 2008 (American Academy of Dermatology, the Society for Investigative Dermatology, the American Society of Dermatopathology, the Society for Pediatric Dermatology, and American Society for Dermatologic Surgery), and the number of faculty members on the editorial boards of 6 major dermatology journals (*Journal of the American Academy of Dermatology*, *Journal of Investigative Dermatology*, *Archives of Dermatology* [currently known as *JAMA Dermatology*], *Dermatologic Surgery*, *Pediatric Dermatology*, and *Journal of Cutaneous Pathology*). Data regarding faculty and residents were obtained from program Web sites and inquiries from individual programs. The year 1974 was used as a cutoff for the number of years a program had been in existence. Years of existence of a program was controlled for in the analysis. The ratio of faculty to residents was calculated per year and categorized as 4 or more or less than 4 to minimize the effect of changing program size over the years. For faculty members who split time between 2 residency programs, each program was given credit for the duration of time spent at that program. Faculty members who hold a PhD only and those who completed their residencies in non-US dermatology residency programs were excluded from the outcome variables. To avoid duplicate faculty publications, collections for each residency program were created within PubMed (ie, if 2 authors from the same program coauthored an article, it was only counted once toward the total number of faculty publications from that program).

Because the data were skewed (ie, there were a large number of programs with 0 graduating chairs/chiefs and PDs), nonparametric analyses were utilized. Logistic regression was used to

calculate the odds of producing chairs/chiefs or PDs (yes vs no). Multiple logistic regression helped to determine those variables that were most closely associated with odds of graduating a chair/chief or PD. Variables with a significance level of $P < .10$ were considered in the multiple logistic regression, and backward selection was used to determine a model. Multiple linear regression was used to determine correlation coefficients for each of the variables and the number of chairs/chiefs or PDs graduated, controlling for the estimated number of graduates from the program and number of years the program had been in existence. Analyses for graduating chairs/chiefs and PDs were conducted separately. The final significance level used was $P < .05$. Data were analyzed using SAS version 9.3. This study was approved by the institutional review board at Kaiser Permanente Southern California.

Results

Data from 103 dermatology residency programs were included in the analysis. Of these programs, 47 had graduated at least 1 chair/chief and 55 had graduated at least 1 PD. Among the programs graduating any chairs/chiefs, they produced an average of 2.04 chairs/chiefs and 1.86 PDs. The 5 dermatology residency programs that graduated the highest total number of chairs/chiefs and PDs were Harvard University (Cambridge, Massachusetts), the University of Michigan (Ann Arbor, Michigan), New York University (New York, New York), Yale-New Haven Hospital (New Haven, Connecticut), and the University of Minnesota (Minneapolis, Minnesota).

Factors that had the highest effect on the odds of a program graduating a chair/chief included the ratio of faculty to residents per year, presence of DF funding in 2008, number of years program was in existence, number of residents, number of full-time faculty, and number of full-time faculty on editorial boards of 6 major dermatology journals (Table 1). When controlling for each of these variables in the final multivariable analysis, programs with 4 or more faculty per resident had 3.31 times the odds of producing a chair/chief (95% confidence interval [CI], 1.14-9.66; $P = .028$).

Factors that had the highest effect on the odds of a program graduating a PD included status as department versus division, ratio of faculty to residents per year, presence of DF funding in 2008, number of lectures given by full-time faculty members at annual society meetings, number of residents, number of years program was in existence, number of full-time faculty, and number of publications from full-time faculty members (Table 2). The most

Table 1.

Dermatology Residency Program Variables Affecting the Odds of Producing a Chair/Chief

Variable	Odds Ratio	95% CI	P Value
Ratio of faculty to residents per year (\geq or <4) ^a	4.63	1.74-12.30	.002
Presence of DF funding in 2008 (yes vs no)	2.06	1.15-3.70	.015
Presence of NIH funding in 2008 (yes vs no)	1.92	0.87-4.23	.106
Department vs division	1.37	0.54-3.44	.509
No. of years program was in existence ^b	1.12	1.05-1.20	<.001
No. of full-time faculty lectures given at annual society meetings in 2008	1.12	1.00-1.27	.052
Total no. of residents in 2008	1.11	1.02-1.22	.023
Total no. of full-time faculty in 2008	1.08	1.02-1.13	.008
No. of full-time faculty on editorial boards in 2008	1.07	1.02-1.13	.034
No. of full-time faculty publications in 2008	1.02	1.00-1.04	.035

Abbreviations: CI, confidence interval; DF, Dermatology Foundation; NIH, National Institutes of Health.

^aStatistically significant in multivariable analysis ($P=.028$).

^bCutoff was 1974.

Table 2.

Dermatology Residency Program Variables Affecting the Odds of Producing a Program Director

Variable	Odds Ratio	95% CI	P Value
Department vs division	2.94	1.12-7.67	.03
Ratio of faculty to residents per year (\geq or <4)	2.64	1.03-6.76	.04
Presence of DF funding in 2008 (yes vs no)	1.78	1.01-3.12	.05
Presence of NIH funding in 2008 (yes vs no)	1.76	0.80-3.89	.16
No. of full-time faculty on editorial boards in 2008	1.24	0.98-1.58	.08
No. of full-time faculty lectures given at annual society meetings in 2008	1.19	1.04-1.35	.01
Total no. of residents in 2008	1.17	1.06-1.30	<.001
No. of years program was in existence ^a	1.12	1.05-1.19	<.001
Total no. of full-time faculty in 2008	1.11	1.04-1.17	<.001
No. of full-time faculty publications in 2008 ^b	1.03	1.01-1.05	.01

Abbreviations: CI, confidence interval; DF, Dermatology Foundation; NIH, National Institutes of Health.

^aCutoff was 1974.

^bStatistically significant in multivariable analysis ($P=.026$).

significant factor associated with graduating PDs after controlling for other variables was the number of publications from full-time faculty members. The odds increased by 3.2% for every 1 additional publication and 32% for every 10 additional publications (95% CI, 1.01-1.06; $P=.026$).

Multiple linear regression demonstrated a positive relationship between the number of graduating chairs/chiefs and total full-time faculty members ($R^2=0.26$; $P=.034$) and ratio of full-time faculty to residents ($R^2=0.29$; $P<.001$). Marginally significant correlations were seen between the number of PDs

and ratio of full-time faculty to residents ($R^2=0.32$; $P=.05$) as well as the number of publications from full-time faculty members ($R^2=0.32$; $P=.05$).

Comment

The ratio of full-time faculty to residents increased a program's odds of graduating a chair/chief. More faculty members may lead to more opportunities for mentorship of residents and young faculty. Mentors are widely perceived to be integral to the learning and development of residents, not only in dermatology⁵ but across all specialties.⁶ Mentors also have been noted to play a key role in bolstering and maintaining interest in academics,⁷ which is true not only with regard to recruiting new residents but for retaining young faculty members. In a study (N=109) that examined factors associated with residents' loss of interest in academic careers, half of the participants reported a lack of effective mentors, role models, and professional guidance.⁸ Mentors provide teaching, supervision, and advice, especially with regard to research and career paths.⁹ A large number of faculty members provides more opportunities for direct mentorship and offers residents more exposure to research, specialty clinics, and academic philosophies, which may positively influence and even inspire academic pursuits and leadership.³

Although the solution to producing future chairs/chiefs and PDs may lie in faculty guidance, finding and retaining faculty members as mentors amidst a shortage of academic dermatologists presents an underlying issue.³ In addition to a lack of mentorship, residents cite bureaucracy, salary differentials, and location to explain a loss of interest in academic careers.⁸ Several programs have been developed to address the recruitment of dermatology residents for academic careers, including combined medical-dermatology programs, 2+2 programs (2 years of clinical residency plus 2 additional research years), clinical research fellowships,¹⁰ and the Society for Investigative Dermatology's Dermatology Resident Retreat for Future Academicians (<http://www.sidnet.org/fortraineesandresidents>).¹¹ Perhaps recruitment should even start at the medical student level. In light of the academic strength of the current pool of dermatology residency applicants,¹² training programs should continue to screen for applicants with sincere interests in academia.¹³ Students with more research and publications may be more likely to pursue academic careers, in accordance with prior studies of dermatology trainees.^{3,14} Studies also have shown that graduates of foreign dermatology residencies¹⁵ and individuals who hold both MD and PhD degrees may be more likely to enter into academic careers.¹⁶

For creating future chairs/chiefs and PDs, retention of young faculty in academics is as important as recruiting residents.¹⁷ At the mid-career level, the decline of funds for research has generated pressure for academic physicians to see increasing numbers of patients, leaving insufficient time for the many duties that accompany academic posts,² including teaching and publishing. Other reasons that faculty members leave their posts before 40 years of age include financial and family concerns¹⁸ as well as the desire for more autonomy.⁴ Formalized training is seen with the American Academy of Dermatology's Academic Dermatology Leadership Program (<https://www.aad.org/members/leadership-institute/mentoring/aad-mentoring-opportunities/academic-dermatology-leadership-program-mentee>), which promotes advanced leadership training to recent graduates.⁵ Other methods include support of young faculty with mentorship; grant applications; and administration at the department, hospital, and government levels.¹⁷ Recruitment of faculty from private practice may represent another potential source of faculty who wish to pursue more scholarly endeavors.⁴ Teaching has been cited as a primary reason for faculty members to remain in academia,¹⁸ and thus time for teaching must be protected. Such a strategy is in accordance with our findings that amount of annual DF funding received, number of full-time faculty publications, number of faculty members on editorial boards of major dermatology journals, and number of lectures given by full-time faculty factors at annual society meetings are positively associated with the odds of producing chairs/chiefs or PDs. In particular, the number of full-time faculty publications is directly related to increased odds of graduates becoming PDs. Residents and young faculty members who take part in research and attend national conferences may find inspiration or develop a passion for academic leadership.

A limitation to this study is that the ratio of faculty to graduated residents for some programs likely has fluctuated over the last 35 years. This study assumed that certain programs remained generally small or large during the course of their existence, which was controlled by using the ratio between faculty and residents. Additionally, the number of years that a program has been in existence influences the likelihood of that program to graduate higher numbers of residents who become chairs/chiefs or PDs. As a result, we used multiple linear regression to control for the number of residents and number of years that a program had been in existence. Finally, while the relationship between academic leaders and research may be explained by the increased likelihood of faculty with more funding, publications, or

lectures to be selected for leadership roles, this finding supports the notion that research can contribute to leadership. This analysis identifies modifiable factors among residency training programs to improve the odds of graduating future academic leaders.

Conclusion

As the present study shows, the ratio of faculty to residents and the number of full-time faculty publications are key to graduating academic leaders in dermatology. Retention of faculty as leaders in academic dermatology is as crucial to the field as recruitment of residents into academic dermatology. Mentorship should be highly encouraged through the creation of formal programs and should not end at the resident level. Emphasizing the intellectually stimulating aspects of academia and providing administrative resources may help decrease the burden of academic duties, allowing the pursuit of teaching and research and ultimately the resources to become candidates for leadership positions in academia.

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