Emergency Medicine Career Outcomes and Scholarly Pursuits: The Impact of Transitioning From a Three-year to a Four-year Niche-based Residency Curriculum

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ABSTRACT

Objectives: In 2008, our emergency medicine (EM) residency program transitioned from a 3-year to a 4-year format. We analyzed the effect that this change had on the scholarly productivity and career choice of graduates, hypothesizing that it would lead residents to be more scholarly productive and graduates to more frequently obtain academic appointments and leadership roles in their first postresidency positions.

Methods: This was a retrospective analysis of graduates ($N = 95$) from a single residency program that underwent a curriculum change from a 3-year to a 4-year format. Three cohorts prior to ($n = 36$) and five cohorts after ($n = 59$) this transition were included. The primary outcome of interest was the setting of graduates' first postresidency position. Secondary outcomes included completion of scholarly activity during training and attaining a leadership role in the first postresidency position.

Results: Of the 4-year program graduates, 44% obtained an academic position compared to 28% of 3-year program graduates. After confounders were controlled for, this difference was statistically discernible only if fellowships were excluded (including fellowship, odds ratio [OR] = 2.25, 95% CI = 0.87 to 5.78; excluding fellowship, OR = 3.53, 95% CI = 1.13 to 11.05). Four-year graduates were more likely to obtain a leadership position immediately after graduation (OR = 13.72, 95% CI = 2.45 to 76.99). Compared to residents in the 3-year program, residents in the 4-year format had a similar likelihood of producing any scholarly work by graduation (OR = 1.69, 95% CI = 0.49 to 5.80) but were more likely to publish peer-reviewed manuscripts (OR = 3.92, 95% CI = 2.25 to 6.83).

Conclusions: Compared to 3-year residency graduates, graduates of our 4-year curriculum were more likely to obtain nonfellowship academic appointments and leadership positions immediately after graduation and to publish their scholarly work during residency. This study suggests that residency applicants seeking to be academically productive during residency and leaders in the field of EM should consider training in a 4-year program with similar goals.

The Accreditation Council of Graduate Medical Education (ACGME) accredits emergency medicine (EM) residency programs in both 3-year and 4-year training formats. As of 2018, the majority of categorical EM programs exist as 3-year training formats, with only 25% of programs using a 4-year training

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format, although that proportion has increased over the past decade.¹

The ACGME requires 4-year EM training programs to “provide additional in-depth experience in areas related to emergency medicine, such as medical education, clinical- or laboratory-based research, or global health.”² Approximately 21% of allopathic EM training programs in the United States provide dedicated enhanced training tracks to their residents, with more 4-year than 3-year programs offering specialty tracks within their training.³ Benefits of programs with specialty tracks or niche-based programs in EM include advanced training, career guidance, and mentorship.⁴ While not described as the impetus for the ACGME requirement, one could postulate that resident’s additional in-depth participation in niche development might lead 4-year graduates to produce more scholarly work during residency and to pursue postresidency academic careers more frequently than their 3-year trainee colleagues.^{4,5}

Over the past 15 years, numerous descriptive studies have reported on EM residents’ decision to pursue a career in academics.^{4,6–9} For example, one reported that only 4% of graduates pursue postresidency fellowships, but another, 13.5%.^{6,7} A third study reported 22% of all graduates pursue an academic career while another, 37%.^{4,9} Furthermore, graduates of residency programs with niche-based curricula are more likely to pursue a career in academics.⁴ These niche-based programs are more likely to be found in 4-year training programs compared to 3-year programs, but there exist discrepant reports as to whether length of training is associated with pursuit of an academic career, in general.^{3,6,7}

Thus, it is unclear to residency program applicants what impact training program length may have on their longer-term career goals. Nevertheless, medical students have ranked length of training as the third-most-important factor in determining whether to pursue postgraduate training in EM and fellowship opportunities as the seventh-most-important factor in this decision.¹⁰ Although staunch supporters exist for both training formats, EM residency program directors appear biased by their personal experiences and thus unable to provide objective opinions on the ideal length of training as they favor formats similar to either the program in which they trained or currently work.¹¹ As such, there are few—if any—reliable resources available to prospective EM residents when they consider their optimal training format.

In July 2008, at the beginning of the 2008 to 2009 academic year, our residency program transitioned from a 3-year to a 4-year niche-based training format. The goal of this transition was to provide a residency curriculum that allowed for the development of a specialized EM niche for each resident and to advance their skills as bedside educators and clinical leaders.

We hypothesized that a training format with these goals alongside an incremental training year would better prepare graduates to enter academic and leadership ranks in their first postresidency positions and contribute to an increase in scholarly output from our residents during training. Our results can provide useful information to program leaders deciding ideal length of training and structure and to applicants seeking a better understanding of these factors on their future career.

METHODS

Study Design

This was a retrospective analysis of graduates from a single residency program that underwent a curriculum format change. We included all residents who graduated from the residency program for 3 years prior to, and for 5 years after, the transition from a 3-year program to a 4-year program. The 3-year pre-period corresponded to the interval from which the decision was made to change the program’s training format until its implementation; exit interview data did not specifically record the outcomes being studied for graduating residents before this cutoff. Only these time periods were compared and our data were not analyzed prior to the conclusion of the study period. Institutional review board approval was sought and the study was deemed exempt.

Study Setting and Population

The study site was a large, urban academic institution, initially home to a 3-year EM residency established in 1974. The program transitioned to a 4-year niche-based residency curriculum in July 2008, at the beginning of the 2008 to 2009 academic year, and graduated its first class from the new curriculum in 2012.

During the transition period from a 3-year to a 4-year curriculum, approximately 73% of the PGY-1 to -3 curriculum remained static. Of the rotations that were altered during this period, two-thirds were adjusted only by rotation length but not by experience while three clinical rotations were eliminated. The

PGY-4 curriculum consists of 1,080 clinical hours in the ED in both primary patient care and supervisory roles with the remainder of nonclinical time protected for work in one or more tracks: administration/leadership, critical care, disaster/austere medicine, emergency medical services, international EM, medical education, observation medicine, pediatric EM, research, tactical medicine, toxicology, and ultrasound.

Data Collection

Data were collected for all graduates of the residency program between 2008 and 2016, resulting in three cohorts who completed training before the program format change (i.e., residents beginning training in July of 2005, 2006, and 2007) and five cohorts after the format change (i.e., residents beginning training in July of 2008, 2009, 2010, 2011, and 2012). Baseline demographic data were collected from the Electronic Residency Application Service (ERAS) and included sex, United States Medical Licensing Examination (USMLE) Step 1 score, post-bachelor's advanced degrees in addition to MD or DO (e.g., PhD, MPH, MS, MEd), and publications prior to beginning residency. In addition to ERAS data, we collected PGY-1 year American Board of Emergency Medicine (ABEM) in-training examination (ITE) scores and mean ITE scores for all examinees for each academic year. We sought the mean national USMLE Step 1 scores for all examinations taken by our study subjects but were unable to obtain this complete data set.

Outcome data were obtained from residency graduation exit interviews to assess initial postresidency position location/type. The initial postresidency position was labeled as community, academic (including fellowship), or military and included whether or not a leadership position was obtained. Academic positions included those with university appointments, those at university sites, and those at community-based academic centers, provided that these positions were affiliated with either a medical school or residency program. Community positions included those at hospitals without learners (either students or residents) and no university affiliations. Leadership positions included any titled leadership role (e.g., ultrasound director, assistant residency director, assistant clinical director) in the first job after graduation.

Graduation exit interviews recorded peer-reviewed publications; book chapters; and regional and national poster, abstract, and oral presentations that occurred during residency training. Finally, residency graduates'

names were searched in PubMed and Google Scholar to identify any additional publications that were completed either during residency training or within 12 months after graduation, for residency-initiated publications.

Outcomes Measures

The primary outcome of interest was setting (community, military, or academic) and type (leadership or nonleadership) of initial postresidency position. Secondary outcomes included the completion of scholarly activity during training, inclusive of any residency-initiated publication up to 1 year after graduation provided that it was related to work started during training. Scholarly activity was defined as peer-reviewed publications; book chapters; and regional and national poster, abstract, and oral presentations.

Data Analysis

Descriptive statistics were generated for all demographics, other resident characteristics and outcome variables. Mean ($\pm$ standard deviation [SD]), median (interquartile range [IQR]), and percentages were calculated as appropriate. Mean ($\pm$ SD) was calculated to describe variability within our sample. Multivariate logistic regression was used to assess the impact of moving from a 3-year to 4-year program on likelihood of the first postresidency position being academic or in a leadership role as well as the likelihood of having produced, and quantity of, scholarly activity. Negative binomial regression was used to estimate the impact of program change on amount of scholarly output (i.e., the number of publications/presentations). The primary independent variable was whether the residency graduate was in the 3- or 4-year program, controlling for sex due to biases in hiring and scholarship, whether the graduate had additional advanced degrees on the assumption that advanced degrees conferred an inclination for academic work, USMLE score on the assumption that the 4-year format might attract a higher academically performing resident, and the percentage of core faculty members that were associate or full professors on the assumption that senior academic faculty would be more inclined toward mentorship and scholarship.^{12,13} To control for changes in faculty composition related to experience in research and academics, the average ratio of faculty holding an academic rank of associate professor or higher to residents over their time in the program was calculated for each cohort. We also tested the ITE score relative

to the mean of all interns in the country instead of raw USMLE to better control for academic performance. We clustered the standard errors of the regression by residency class to control for year-to-year class differences. Results were summarized as odds ratios (ORs) or incident rate ratios (IRR) and corresponding 95% confidence intervals (CIs) for logistic regressions and negative binomial regressions, respectively. Analyses were performed in STATA version 14.1 software.

RESULTS

There were 36 graduates in the 3-year program cohort and 59 graduates in the 4-year program cohort (Table 1). Each class consisted of 12 graduates, with one graduate in the 3-year cohort graduating off-cycle. One graduate who required extended length of training due to prolonged medical leave was excluded from our 4-year cohort. The two cohorts were similar, although the 3-year program cohort had a higher percentage of graduates with advanced degrees (33% vs. 24%, respectively) and the 4-year cohort had slightly higher test scores (Table 1 and Figure S1 in Data Supplement S1 [all supplemental material available as supporting information in the online version of this

paper, which is available at <http://onlinelibrary.wiley.com/doi/10.1002/aet2.10435/full>). Results including ITE and USMLE were qualitatively similar, so only USMLE scores are reported (ITE results available in Tables S1 and S2).

The number of core EM faculty at our institution increased by 67% during the study period (Table S3). Of the EM faculty during the first year of the study period, 39% remained on the faculty during the final year of the study period. The residency program director and emergency department chair were unchanged in their leadership positions throughout the study period. Results excluded the composition of core faculty (Figure 1) as this was highly correlated (94.0%) with the change in program format, did not qualitatively alter results, and was not significant in any analysis.

Academic and Leadership Position Placement

Of the graduates from the 4-year program, 44% obtained an academic position (including fellowship) immediately after residency, compared to 28% of graduates from the 3-year program (Table S4). Multivariable statistical analysis found that the implementation of a 4-year program was not statistically associated with

Table 1
Resident Demographics and Characteristics

Variable	Three-year Program (n = 36)	Four-year Program (n = 59)
Female	42%	44%
Advanced degree, Y/N	33%	24%
Prior publications, Y/N	56%	53%
Number of prior publications, mean ($\pm$ SD)*	1.6 ($\pm$ 2.2)	1.9 ($\pm$ 4.1)
Number of prior publications, median (IQR)	1 (0–2)	1 (0–2)
USMLE Step 1, mean ($\pm$ SD)	220.2 ($\pm$ 14.1)	231.4 ($\pm$ 16.3)
Intern ITE score, mean ($\pm$ SD)	65.9 ($\pm$ 9.1)	72.7 ($\pm$ 7.0)
Difference from national ITE mean ($\pm$ SD)	–4.3 ($\pm$ 8.9)	1.0 ($\pm$ 6.7)
Difference from national ITE median ($\pm$ SD)	–4.4 ($\pm$ 9.0)	0.6 ($\pm$ 6.7)
Ratio of senior core faculty to residents, mean ($\pm$ SD) [†]	0.09 ($\pm$ 0.004)	0.14 ($\pm$ 0.03)
Program graduation year (intern academic year), n		
2008 (2005–2006)	11	
2009 (2006–2007)	12	
2010 (2007–2008)	13	
2012 (2008–2009)		11
2013 (2009–2010)		12
2014 (2010–2011)		12
2015 (2011–2012)		12
2016 (2012–2013)		12

ITE = in-training examination, missing seven values; USMLE = United States Medical Licensing Examination, missing two values.

*Data were highly skewed with only about 20% of residents having more than one publication and only two residents with more than 10 publications (see Figure S1).

[†]The mean ratio of core faculty that were associate professors or professors to cohort residents.

Figure 1. Ratio of core senior faculty (associate professor and professor) to total faculty and to residents over time.

attaining an academic position (including fellowship) after controlling for sex, USMLE score, and starting the program with an advanced degree(s) or prior publication(s) (OR = 2.25, 95% CI = 0.87 to 5.78; Table 2).

Fellowship opportunities were pursued by 13.9% of 3-year graduates and 8.5% of 4-year graduates (Table S4). When fellowships were excluded from the academic position category, multivariable statistical analysis found that the implementation of a 4-year program was associated with a higher likelihood of attaining an academic position immediately postgraduation after controlling for sex, USMLE score, and starting the program with an advanced degree(s) or prior publication(s) (OR = 3.53, 95% CI = 1.13 to 11.05). Four-year graduates were not, however, statistically less likely to pursue fellowship opportunities after residency (OR = 0.58, 95% CI = 0.18 to 1.87; Table 2). USMLE score was not associated with differences in academic position placement. Replacing USMLE score with ITE did not qualitatively alter the results (Table S1).

Of the graduates from the 4-year program, 22% obtained a leadership position immediately after residency, compared to 3% of graduates from the 3-year program (Table S4). Multivariable statistical analysis found that the implementation of a 4-year program was associated with a higher likelihood of attaining a leadership position immediately postgraduation after controlling for sex, USMLE score, and starting the

program with an advanced degree(s) or prior publication(s) (OR = 13.72, 95% CI = 2.45 to 76.99; Table 2).

Scholarly Output

After controlling for sex, USMLE score, and starting the program with an advanced degree(s) or prior publication(s), the transition to our 4-year program was not associated with an increased likelihood of residents producing any scholarly work by graduation (OR = 1.69, 95% CI = 0.49 to 5.80; Table 2). Graduates of the 4-year program were, however, more likely to produce at least one peer-reviewed publication by graduation (OR = 3.92, 95% CI = 2.25 to 6.83; Table 2). This finding was maintained when controlling for the additional year of training in the 4-year format (i.e., at graduation for the 4-year program and at 1 year after graduation for the 3-year program; OR = 3.29, 95% CI = 1.58 to 6.84; Table 2).

Graduates of the 4-year curriculum produced a higher volume of scholarly output than graduates of the 3-year curriculum (Tables 2 and 3). The 4-year graduates who published were more productive than the 3-year graduates that published (mean $\pm$ SD) number of publications = 1.4 $\pm$ 2.8] vs. 0.3 $\pm$ 0.8], respectively; Tables 3, S2 and S5). These results were consistent both at 1 year postgraduation (i.e., at 48 months for the 3-year cohort and at 60 months for the 4-year cohort) and after 48 months from start of program (i.e., 1 year after graduation for the 3-year

Table 2
Impact of the Change From a 3-year to a 4-year Program on Academic or Leadership Position and Scholarly Output

	Academic Position	Academic Position Excluding Fellowship	Fellowship	Leadership Position*	Peer reviewed Publication at Graduation	Peer-reviewed Publication, 1 Year Postgraduation	Peer-reviewed Publication at 48 Months†	Publications and Presentations
Three-year program	—	—	—	—	—	—	—	—
Four-year program	2.25 (0.87–5.78)	3.53 (1.13–11.05)	0.58 (0.18–1.87)	13.72 (2.45–76.99)	3.92 (2.25–6.83)	8.93 (2.64–30.21)	3.29 (1.58–6.84)	1.69 (0.49–5.80)
Female	1.90 (0.62–5.83)	2.48 (0.74–8.31)	0.67 (0.14–3.07)	2.99 (1.21–7.37)	2.06 (0.99–4.29)	1.79 (0.76–4.19)	1.90 (0.89–4.02)	0.99 (0.26–3.80)
USMLE Step 1	1.03 (0.99–1.07)	1.02 (1.00–1.04)	1.03 (0.98–1.07)	—	1.00 (0.98–1.02)	0.98 (0.96–1.01)	1.00 (0.98–1.02)	1.02 (1.00–1.05)
Advanced degree(s)	3.60 (1.50–8.66)	2.72 (1.02–7.27)	2.45 (1.36–4.43)	2.70 (0.94–7.70)	2.20 (0.62–7.78)	3.11 (0.68–14.22)	2.54 (0.72–8.99)	1.45 (0.58–3.61)
Prior publication(s)	2.28 (0.69–7.54)	2.24 (0.86–5.88)	1.41 (0.20–9.79)	2.93 (1.67–5.15)	1.48 (0.92–2.39)	1.57 (0.81–3.05)	1.53 (0.93–2.52)	2.08 (0.71–6.10)
No.	92	92	92	92	92	92	92	92

Data are reported as OR (95% CI).

USMLE = United States Medical Licensing Examination.

*USMLE was collinear with 4-year program and so was dropped.

†Compares publication at graduation for 4-year program and 1 year after graduation for 3-year program.

cohort and at graduation for the 4-year cohort; Tables 3, S2 and S5). Excluding the two individuals in the 4-year cohort who began training with more than 10 preridency publications, and thus were extreme outliers in our data set, did not qualitatively alter the results (Figure S1 and Table S6).

DISCUSSION

The ACGME accredits EM residency programs in both 3-year and 4-year training formats but, to date, there have been limited data available to describe how length-of-training might affect EM residents' scholarly output and likelihood to enter academics or obtain a leadership role immediately after residency graduation.²

Our data suggest that a 4-year training format with specific goals is associated with a significant increase in residents' publication of peer-reviewed literature and graduates' likelihood of obtaining nonfellowship academic positions and leadership opportunities immediately after graduation. Trainees and educators seeking tangible outcomes in academic EM, such as increased scholarly productivity and a higher likelihood of attaining a leadership role after graduation (either in academic or community positions), may be more successful in a structured 4-year niche-based training program.

Numerous descriptive studies have reported on EM residents' decision to pursue a career in academics, with inconsistent results over time.^{4,6–9} Application of these prior studies' findings is limited by the lag time separating their comparison cohorts, and because these studies were performed at different programs, it is difficult to make head-to-head comparisons between them. Our study fills these gaps in the literature. The unique 3- to 4-year transition that our program underwent allows a reasonable assessment of quasi-case control data to ascertain the impact on residents' academic proclivity and leadership potential.

Graduates of our 4-year residency program seemed less inclined to pursue fellowship training, as evidenced by the 13.9% of 3-year graduates compared to 8.5% of 4-year graduates who entered fellowships. This may suggest that graduates of 4-year residency programs are, in general, less apt to pursue fellowship training; however, our small sample size precludes drawing definitive conclusions and more data would be needed to answer this question. Nevertheless, when fellows were excluded from our predefined academic

Table 3

Scholarly Output Associated With the 4-year Program Format Compared to 3-year Format*

	Number of Peer-reviewed Publications at Graduation	Number of Peer-reviewed Publications at 48 Months [†]	Number of Peer-reviewed Publications, 1 Year Postgraduation
Three-year program	—	—	—
Four-year program	2.16 (1.15–4.07)	2.02 (1.08–3.79)	1.90 (0.99–3.65)
Female	1.48 (0.87–2.54)	1.56 (0.97–2.52)	1.73 (1.16–2.57)
USMLE Step 1	1.01 (1.00–1.03)	1.01 (1.00–1.03)	1.01 (1.00–1.03)
Advanced degree	1.78 (0.75–4.24)	1.72 (0.70–4.24)	1.71 (0.69–4.26)
Prior publications	1.42 (0.99–2.04)	1.35 (0.97–1.89)	1.35 (1.04–1.75)
No.	34	35	44

Data are reported as IRR (95% CI).

IRR = incidence rate ratio; USMLE = United States Medical Licensing Examination.

*Compares only residents that published at least one publication by date.

[†]Compares publication at graduation for 4-year program and 1 year after graduation for 3-year program.

position category, we found that graduates of the 4-year curriculum were more than three times as likely to achieve an appointment in academic EM in their first postresidency position compared to 3-year curriculum graduates. This finding suggests that a structured 4-year niche-based residency training program, like ours, may supplant the necessity of completing additional training after residency in order to be competitive in the academic EM market.

The performance of our interns on the USMLE Step 1 and ABEM ITE had no association with likelihood of publishing scholarly work; indeed, the test-taking abilities of residents in the 3-year and 4-year programs were similar. It is also interesting that the proportion of individuals who obtained advanced degrees before residency was lower for our 4-year graduates than it was for their 3-year counterparts, which suggests that the increased likelihood of publishing and obtaining a postresidency nonfellowship academic or leadership role for 4-year graduates was not merely a result of recruiting a higher academically performing resident, as captured by these metrics.

Regardless of their preresidency publication record, more graduates of our 4-year niche-based curriculum published their scholarly work compared to graduates of the 3-year curriculum. While the inclusion of presentations in our analysis resulted in the finding that overall scholarly output was equivalent between groups at the time of graduation, we believe that the value of knowledge dissemination via peer-reviewed publications can be weighted above that of oral or poster presentations or other similar nonpublished scholarly activity and may be indicative of the overall quality of the work produced by the graduates of the 4-year program.

To control for increased time to be academically productive in the 4-year format, the number of publications was compared 1 year after graduation for the 3-year cohort and at graduation for the 4-year cohort (i.e., 4 years total for each), and 4-year format trainees still were more likely to be academically productive. This finding suggests that the format and experience of the 4-year curriculum—and not simply the additional 12 months—were responsible for the increase in publications and likely reflects the benefit that 4-year residents can obtain from additional structured training time with clear mentorship, career guidance, and a goal of providing “in-depth” training in one of many niche-based areas.

In addition to the publication success demonstrated by residents in the 4-year curriculum, graduates of this program were nearly 14-fold more likely to obtain a leadership position immediately after residency compared to their 3-year peers. Academic EM chairpersons tend to value teaching, publishing, research, and fellowship training as important attributes when considering candidates to hire as attending physicians.¹⁴ It stands to reason that residency graduates who have attained these important skills during residency training might be more attractive candidates likely to be entrusted by chairpersons or directors to assume leadership roles immediately after residency without additional postresidency training or experience.

Our data suggest that EM trainees and educators seeking to increase residents' scholarly publications and likelihood of attaining a nonfellowship academic position or leadership role after graduation (either in academic or in community positions) may be more likely to be successful in a structured 4-year niche-based training program. We believe that the skills

residents attain in a 4-year niche-based curriculum allow graduates to be immediately attractive to potential employers without requiring postresidency training or experience. While our program was developed with the express intent of increasing academic and leadership careers for our graduates, it is plausible that other 4-year programs may see a similar increase in the desired outcomes upon which they place their program's focus, such as advocacy or community service involvement.

LIMITATIONS

Although this study represents a unique assessment of the impact of a 3-year versus a 4-year EM training format, there are limitations to note. First, our data are derived from a single academic center and our results may reflect practices that are specific or unique to our institution. While we believe that there were few significant structural changes to our institution and department during this transition, there may be factors that were unmeasured and thus not considered.

Second, as with all retrospective observational analyses, we were unable to control for all variables that might affect a resident's decision to pursue scholarship opportunities, an academic career or a leadership position after training, or pursue training in a 4-year program. We attempted to account for our 4-year curriculum attracting more academically driven applicants by measuring and controlling for preresidency publications, USMLE score, and advanced degrees in addition to a MD/DO, which are all indirect measurements of academic tendencies.

Third, we were unable to obtain national mean USMLE data, and not every resident had an ITE score. However, the USMLE and ITE data were colinear and analysis of both scores individually revealed qualitatively equal results, suggesting this did not greatly bias results.

Fourth, the composition of the faculty changed in a largely linear way through time, which did not allow for an insight into this change's effects. Although it is not surprising that the career progression of academic emergency physicians paralleled the alteration to the residency curriculum, it is possible that changes in the faculty, which were not captured by the ratio of senior faculty to residents, may have impacted the results. Our hypothesis was that senior faculty would be more inclined toward mentorship of trainees; however, it was not possible to measure each associate professor

and professor's proclivity toward supporting resident scholarship.

Fifth, our data set included a relatively small number of study participants, reflective of a program that enrolls only 12 residents annually. It is plausible that with a larger sample size, our findings may have had different statistical significance.

Sixth, three authors of this study (MRE, GDK, LR) were integrally involved with the residency program during the study period. Furthermore, one author (MRE) was a resident in the 4-year cohort and thus represents a participant in the data set but was not aware of, nor involved in, study concept or design until after all personal data were collected.

Finally, although our data collection was standardized for all study subjects, it is plausible that we were unable to capture all publications, book chapters, or regional and national presentations that occurred during residency training and in the 12 months after graduation.

CONCLUSIONS

Our residency program transitioned from a 3- to a 4-year format with the goals of providing a curriculum structured to allow residents to develop a specialized emergency medicine niche and advance skills as a bedside educator and clinical leader during residency training. These data suggest that a 4-year niche-based training format with specific goals can increase residents' scholarly publications and result in a higher likelihood of graduates obtaining a nonfellowship academic appointment or leadership role in their first postresidency position. Trainees and educators seeking similar outcomes in academic emergency medicine are more likely to be successful with a 4-year training program with comparable goals and resource commitment.

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Supporting Information

The following supporting information is available in the online version of this paper available at <http://onlinelibrary.wiley.com/doi/10.1002/aet2.10435/full>
Data Supplement S1. Supplemental material.