Scholarly Tracks in Emergency Medicine Residency Programs Are Associated with Increased Choice of Academic Career

Jaime Jordan, MD†‡  
Michael Hwang, MD*  
Amy H. Kaji, MD, PhD†‡  
Wendy C. Coates, MD†‡  

*Harbor-UCLA Medical Center, Department of Emergency Medicine, Torrance, California  
†David Geffen School of Medicine at University of California Los Angeles, Los Angeles, California  
‡Los Angeles Biomedical Research Institute at Harbor-UCLA, Torrance, California

Section Editor: Jeffrey Druck, MD  
Submission history: Submitted October 13, 2017; Revision received January 10, 2018; Accepted January 25, 2018  
Electronically published March 8, 2018  
Full text available through open access at http://escholarship.org/uc/uciem_westjem  
DOI: 10.5811/westjem.2018.1.36753

Introduction: Career preparation in residency training is not standardized. Scholarly tracks have emerged in emergency medicine (EM) residencies to allow specialized training in an area of focus. The characteristics of these tracks and their value and impact on resident career choice are unknown. We aim to describe the current state of scholarly tracks in residency training programs and their association with pursuit of an academic career.

Methods: Program leaders at EM training programs completed an online survey consisting of multiple-choice items with free-text option. Additionally, participants completed a matrix of dropdown items identifying the immediately chosen post-residency position and applicable track of each member of their graduating class. Descriptive statistics were calculated and reported for multiple-choice items. We performed comparative statistics using chi-squared and Wilcoxon rank-sum tests. Free-text responses were analyzed using a thematic approach.

Results: 113/157(72%) programs participated, 51 with and 62 without tracks. Tracks were more common in four-year programs (odds ratio [OR]=4.8;[2.0-11.9]) and larger programs (chi-sq, p=0.001). Perceived benefits of tracks from programs with them included advanced training (46/50; 92%), career guidance (44/50; 88%), mentorship (44/50; 88%), and preparation for an academic career (40/50; 80%). Residents often participated in a single track (37/50; 74%) usually during their later residency years. Programs with tracks were more likely to graduate residents to an academic career, OR 1.8;[1.3-2.4].

Conclusion: This study describes the current characteristics and perceptions of scholarly tracks in EM residencies. Scholarly tracks are associated with an academic position immediately following residency. The results of this study may inform the development and use of scholarly tracks in residency training programs. [West J Emerg Med. 2018;19(3)593–599.]
Scholarly Tracks in EM Residency Increase Choice of Academic Career

Jordan et al.

including personal and financial preferences as well as training program characteristics.\textsuperscript{2-12} Prior literature has demonstrated that residents may feel ill-prepared for a career in academic medicine due to lack of training, research skills, and mentorship.\textsuperscript{2,13} To meet this need, some programs have implemented “scholarly tracks”: longitudinal curricular experiences with clear goals and objectives to allow residents to explore and develop skills in a particular clinical or academic area of focus within EM.\textsuperscript{14} In addition to exposure to a specific area of concentration, tracks may increase scholarly activity, academic success, and selection of a career in academic medicine.\textsuperscript{14,16} Despite these potential benefits and suggested strategies for implementation, a recent review of publicly available data demonstrated that specialized tracks are not widespread in EM training programs.\textsuperscript{14,17} The reasons for this are unclear. Additionally, the value of specialized tracks and impact on resident career choice remains unknown.

The purpose of this study was to assess the prevalence and characteristics of specialized tracks as well as perceived benefits and barriers to implementation in EM residency training programs. Additionally, we sought to evaluate the relationship between tracks and resident career choice and whether there is an association between tracks and choosing an academic career.

METHODS

Study Setting and Participants

We identified ACGME-accredited EM training programs through their accreditation data system.\textsuperscript{18} To prevent duplication, one member of program leadership from each program was invited to participate based on available contact information with preference for seniority (i.e., program director [PD] over assistant/associate program director [APD]). We collected data between March 2017 and June 2017. This study was deemed exempt by the institutional review board of the Los Angeles Biomedical Research Institute at Harbor-UCLA Medical Center.

Study Design

This was a cross-sectional survey study. We identified contact information for potential participants through the ACGME accreditation data system, Society for Academic Emergency Medicine Residency Directory, Internet search, and personal knowledge of study team members.\textsuperscript{18,19} We sent email invitations with a link to an Internet-based survey administered by SurveyMonkey\textsuperscript{®} to potential participants.\textsuperscript{20} Two follow-up emails were sent at bi-weekly intervals to non-responders. Informed consent was implied by those participants who chose to click on the survey link.

Instrument Development

The instrument was developed by our study group of EM education researchers based on literature review and our prior research in this area according to established guidelines for survey research.\textsuperscript{17,21} The survey consisted of multiple-choice items. For items where an “other” choice was available, participants were permitted to enter a free-text response. Participants were asked to complete a matrix of dropdown menus identifying the career choice and track (if present) for each resident in their graduating class. All items were read aloud and discussed among members of the study group to ensure response process validity. We then piloted the survey among a small group of representative subjects, and made revisions based on feedback from pilot testing. The final survey instrument is available in Appendix A. To incorporate all available data and maximize response rate, completion of all survey questions was not required.

Statistical Analysis

Residency-associated variables included whether tracks were offered, geographic region (West, Southwest, Midwest, Southeast, and Northeast), format (PGY1-3 vs. PGY1-4), total number of residents in the program, number of fellowships offered, and types of fellowships. The tracks were further categorized by whether the tracks were “clinical” (critical care, hyperbarics, pediatric EM, sports medicine, toxicology, ultrasound, wilderness medicine) or “non-clinical” (administration, education, emergency medical services, global health, research, simulation). Resident-level variables included type of track (if the resident came from a
program that offered tracks), and the intended educational or employment position after completion of residency. To answer the broad question of whether or not tracks were associated with an academic career, career options were further categorized into academic (academic full-time, academic part-time, fellowship) vs. non-academic (community practice non-teaching, community practice with teaching, other residency, non-clinical career, unknown). Fellowship was included in the academic category as this has been associated with academic career, and fellowship training is strongly recommended by experts in EM as a prelude to an academic career.²,²²,²³

All data were entered into Microsoft Excel (Microsoft Corporation, Redmond, WA) and transferred to SAS 9.4 (SAS Institute, Cary, NC) for analysis. We calculated and reported descriptive statistics for multiple-choice items. We report the results of comparisons between categorical variables, such as tracks and career choice, using odds ratios and proportions with exact binomial confidence intervals. To compare two cohorts (e.g., tracks vs. those without tracks or academic career vs. non-academic career) with respect to a multi-level categorical predictor (e.g., region), we used the chi-squared test. When comparing continuous variables, such as the number of fellowships offered, we described medians with interquartile ranges and used the non-parametric Wilcoxon rank-sum test. To adjust for potential correlations of residents within residency programs, we used a generalized estimating equation to adjust for clustering by program. Free-text responses were analyzed using a thematic approach.

RESULTS

General Results

A total of 113/157 (72%) programs completed the survey. Fifty-one programs reported having tracks. Characteristics of programs with and without specialized tracks are listed in Table 1. There was no significant difference in location between programs with tracks vs. those without (p = 0.6). Tracks were more common in four-year programs (OR = 4.8; [2.0-11.9]) and larger programs (chi-sq, p = 0.001). Programs with tracks were also more likely to offer a greater number of fellowships than those without tracks with medians of 5-[2-6] and 3-[1-5] respectively; p=0.03. The most common reasons reported for not having tracks was insufficient faculty manpower (28/57;49.1%). Additional reasons are described in Table 2. Written comments from respondents who selected “other” as a reason identified three major themes: 1) the program was in the process of developing tracks; 2) the program or program leadership was new; or 3) an individualized approach to career needs was preferred.

Description of Tracks

For those programs with tracks, track characteristics are listed in Table 3. Programs had various years of experience with tracks. Track participation was mandatory in 40% (20/50) of programs, usually during the later years in residency. Residents commonly participated in a single track (37/50; 74%) and/or participated continuously (33/50; 66%). Written responses from those selecting “other” for how residents participate in tracks revealed two major themes: residents

![Table 1. Comparison of characteristics between residency programs with and without tracks.](image)

| Program format          | Programs without tracks (n= 62)* | Programs with tracks (n= 51)* |
|-------------------------|----------------------------------|-------------------------------|
| Total number of residents |                                  |                               |
| 15 or less              | 0/57 (0%)                        | 0/50 (0%)                     |
| 16-30                   | 23/57 (40.4%)                    | 7/50 (14.0%)                  |
| 31-45                   | 22/57 (38.6%)                    | 18/50 (36.0%)                 |
| 46-60                   | 8/57 (14.0%)                     | 16/50 (32.0%)                 |
| 61 or more              | 4/57 (7.0%)                      | 9/50 (18.0%)                  |
| Number of fellowships   |                                  |                               |
| Median, [interquartile range] | 3 [1-5]                        | 5 [2-6]                      |
| Fellowships currently offered |                                |                               |
| Administration          | 18/57 (31.6%)                    | 22/50 (44.0%)                 |
| Critical care           | 8/57 (14.0%)                     | 14/50 (28.0%)                 |
| Education               | 14/57 (24.6%)                    | 21/50 (42.0%)                 |
| EMS                     | 22/57 (38.6%)                    | 26/50 (52.0%)                 |
| Global health           | 16/57 (28.1%)                    | 17/50 (34.0%)                 |
| Hyperbarics             | 2/57 (3.5%)                      | 0/50 (0%)                     |
| Pediatrics              | 18/57 (31.6%)                    | 20/50 (40.0%)                 |
| Research                | 15/57 (26.3%)                    | 23/50 (46.0%)                 |
| Simulation              | 12/57 (21.1%)                    | 14/50 (28.0%)                 |
| Sports medicine         | 7/57 (12.3%)                     | 12/50 (24.0%)                 |
| Toxicology              | 10/57 (17.5%)                    | 14/50 (28.0%)                 |
| Ultrasound              | 35/57 (61.4%)                    | 37/50 (74.0%)                 |
| Wilderness medicine     | 6/57 (10.5%)                     | 5/50 (10.0%)                  |
| None                    | 9/57 (15.8%)                     | 6/50 (12.0%)                  |
| Other                   | 6/57 (10.5%)                     | 7/50 (14.0%)                  |

EMS, emergency medical services; PGY, post-graduate year.

*6 Participants, 5 from programs without tracks and 1 from a program with tracks, answered the question about the presence of tracks, but did not complete any additional questions in the survey.
Table 2. Reasons residency programs do not have tracks.

| Reason                                      | n (%)  |
|---------------------------------------------|--------|
| We don’t have the faculty manpower to support tracks | 28 (49.1%) |
| There is insufficient time in the resident schedule | 19 (33.3%) |
| We don’t have administrative resources to support tracks | 16 (28.1%) |
| We do not feel that tracks would be helpful | 15 (26.3%) |
| Our residents don’t want tracks | 15 (26.3%) |
| Other | 14 (24.6%) |
| There is inadequate funding to support tracks | 12 (21.1%) |
| We don’t have leadership support for tracks | 8 (14.0%) |
| We don’t have enough faculty expertise to offer tracks | 7 (12.3%) |
| We don’t know how to implement a track program | 5 (8.8%) |

 rotate through all tracks as an intern and then select one in later years, and residents participate in as many tracks as they choose. The most commonly perceived benefits of tracks to residents were an opportunity for advanced training in an area of focus (46/50; 92%), career guidance/exploration/selection (44/50; 88.0%), mentorship (44/50; 88.0%), and preparation for an academic career (40/50; 80.0%) (Table 4).

**Tracks and Careers**

Immediate post-residency career is shown in Table 5. Programs with tracks were more likely to graduate residents to an academic position, OR = 1.8 [1.3-2.4]. The type of track pursued, clinical vs. nonclinical was not significantly associated with immediate post-residency academic career, OR = 1.0,[0.6-1.9].

**DISCUSSION**

In this study we found that residency programs with tracks were more likely to graduate residents to an academic career. This is not surprising, as tracks offer the opportunity for advanced training, scholarship, and directed mentorship, which have been previously identified as being associated with an academic career. A four-year program format has also been associated with academic career choice, and in our study we found that tracks were more common in four-year programs. Interestingly, we did not find an association between type of track completed, clinical vs. nonclinical, and academic career. This was somewhat surprising as one might imagine that residents with an interest and additional training in areas such as administration, education, and research may be more likely to pursue an academic career. However, academicians may have primary job roles that are both non-clinical (i.e., research director, PD) and clinical (i.e. ultrasound director, pediatric EM director).

It is important to note that this study found an association between scholarly tracks and an initial academic position, but this does not necessarily indicate causation. It is not known if the tracks themselves increase the likelihood of choosing an academic career or if the presence of tracks is simply an indicator that a program has more resources and/or specifically encourages academic endeavors as part of its mission. Residents who have a predetermined academic career preference may select training programs with this type of curricular offering to better meet their needs. Some literature demonstrates that residents may not feel well prepared for an academic career. In our study population, the majority of residents entered community practice (with and without teaching) immediately following residency. This is similar to what has been reported previously for EM residents. In contrast to Lubavin’s study in 2004, we found a greater percentage of residents entering fellowships and less an academic career straight after residency. However, if these categories (fellowships and those who assume an academic position directly after residency) are combined, then our results are similar. Securing an academic position may have become more competitive in recent years, necessitating applicants to gain additional skills and experience. EM leaders strongly recommend fellowship as a precursor to an academic career. Fellowship affords protected time to develop expertise in a specific niche without the multiple competing demands of an academic position.

Programs with tracks noted multiple benefits, including advanced training, career guidance, mentorship, and preparation for an academic career. Despite these benefits as well as prior literature suggesting strategies for successful implementation, we found that tracks are not highly prevalent (though there were additional programs in the process of developing tracks). The most notable reasons for not having tracks in this study were lack of faculty manpower, insufficient time, and lack of administrative resources. These barriers may explain why tracks were
more common in larger programs and those with a four-year format as these programs may have a larger faculty to share the workload, greater administrative resources, and more time and flexibility to incorporate such curricula. As there is scant literature defining and reporting objective outcomes resulting from implementing tracks, programs may also be hesitant to devote resources to their development and implementation until further research is done.

For those programs with tracks, our study found that residents usually participate in one track continuously in their later years, with some offering an exploratory rotation through tracks in the earlier years. This likely is by design to meet the overall objectives of such curricula. Trainees need time to consider and select an area of focus that most interests them. Concentrating on a single area with focused mentorship facilitates the development of specialized expertise, allowing for consistent growth and accomplishment of scholarly work.

**LIMITATIONS**

This was a survey study and the results are subject to the limitations inherent to this type of data collection. As this was a cross-sectional study, only one period of time was evaluated and it is possible that results may vary if multiple years were incorporated, longitudinally. Additionally, data were collected from only one member of the residency leadership team. This may have led to limited insight in the free-response section, and confirmation of accuracy of individual data was not available. Although the survey response rate was 72%, since we do not have information on the non-respondents, there may have been selection bias.

Additionally, not all respondents completed every survey item, and thus, we may have missed some information. Despite these limitations, we feel this study provides important information regarding scholarly tracks. Our results suggest there is an association between programs with scholarly tracks and selection of an academic career. Furthermore, many perceive benefits of tracks. There are still many questions left unanswered, and research should focus on defining objective outcomes from implementing tracks and whether the association between tracks and the selection of an academic career is due to the tracks themselves or the self-selection of residents.

**CONCLUSION**

This study describes the current prevalence, characteristics, and perceived benefits of scholarly tracks in residency training. Scholarly tracks are associated with an academic position immediately following residency. The results of this study may inform the development and usage of scholarly tracks in residency programs.
Table 4. Perceived benefits of tracks.

| Benefit                                      | n (%) Total n = 50 |
|----------------------------------------------|---------------------|
| Advanced training in an area of focus        | 46 (92.0%)          |
| Career guidance/exploration/selection        | 44 (88.0%)          |
| Directed mentorship                          | 44 (88.0%)          |
| Development of a niche                       | 42 (84.0%)          |
| Preparation for an academic career           | 40 (80.0%)          |
| Preparation for a leadership role            | 32 (64.0%)          |
| Creation of a collaborative network          | 25 (50.0%)          |
| Increased scholarly productivity             | 25 (50.0%)          |
| Improved wellness during residency           | 17 (34.0%)          |
| Improved clinical skills                     | 7 (14.0%)           |
| Other                                        | 3 (6.0%)            |
| None                                         | 0 (0%)              |

Table 5. Immediate post-residency career.

| Career category       | Immediate post-residency career | Residents from programs without tracks n (%), total n= 517 | Residents from programs with tracks n (%), total n= 267 | All residents n (%), total n= 784 |
|-----------------------|---------------------------------|----------------------------------------------------------|----------------------------------------------------------|----------------------------------|
| Academic              |                                 |                                                          |                                                          |                                  |
| Academic- full time   | 33 (6.4%)                       | 26 (9.7%)                                                | 59 (7.5%)                                                |                                  |
| Academic- part time   | 22 (4.3%)                       | 7 (2.6%)                                                 | 29 (3.7%)                                                |                                  |
| Fellowship            | 95 (18.4%)                      | 82 (30.7%)                                               | 177 (22.6%)                                              |                                  |
| Non-academic          |                                 |                                                          |                                                          |                                  |
| Community practice non-teaching               | 271 (52.4%)                   | 108 (40.4%)                                              | 379 (48.3%)                                              |                                  |
| Community practice with teaching                | 78 (15.1%)                   | 41 (15.4%)                                               | 119 (15.2%)                                              |                                  |
| Other residency        | 1 (0.2%)                        | 0 (0%)                                                   | 1 (0.1%)                                                 |                                  |
| Non-clinical practice  | 1 (0.2%)                        | 0 (0%)                                                   | 1 (0.1%)                                                 |                                  |
| Unknown               | 16 (3.1%)                       | 3 (1.1%)                                                 | 19 (2.4%)                                                |                                  |

Address for Correspondence: Jaime Jordan, MD, Harbor-UCLA Medical Center, Department of Emergency Medicine, 1000 W. Carson Street, Box 21, Torrance, CA 90502. Email: jaimejordanmd@gmail.com.

Conflicts of Interest: By the WestJEM article submission agreement, all authors are required to disclose all affiliations, funding sources and financial or management relationships that could be perceived as potential sources of bias. No author has professional or financial relationships with any companies that are relevant to this study. There are no conflicts of interest or sources of funding to declare.

Copyright: © 2018 Jordan et al. This is an open access article distributed in accordance with the terms of the Creative Commons Attribution (CC BY 4.0) License. See: http://creativecommons.org/licenses/by/4.0/

REFERENCES

1. ACGME Program Requirements for Graduate Medical Education in Emergency Medicine. Available at: http://www.acgme.org/Portals/0/PAAssets/ProgramRequirements/110_emergency_medicine_2017-07-01.pdf. Accessed August 2, 2017.
2. Sanders AB, Fulginiti JV, Witzke DB. Factors influencing resident career choices in emergency medicine. Ann Emerg Med. 1992;21(1):47-52.
3. Sanders AB, Fulginiti JV, Witzke DB, et al. Characteristics influencing career decisions of academic and nonacademic emergency physicians. Ann Emerg Med. 1994;23(1):81-7.
4. Burkhardt J, Kowalenko T, Meurer W. Academic career selection in American emergency medicine residents. Acad Emerg Med. 2011;S48-S53.
5. Adler DG, Hilden K, Wills JC, et al. What drives US gastroenterology fellows to pursue academic vs non-academic careers?: Results of a national survey. *Am J Gastroenterol.* 2010;105(6):1220-3.
6. Borges NJ, Navarro AM, Grover AM, et al. How, when, and why do physicians choose careers in academic medicine? A literature review. *Acad Med.* 2010;85(4):680-6.
7. Straus SE, Straus C, Tzanelos K. Career choice in academic medicine. *J Gen Intern Med.* 2006;21(12):1222-9.
8. DeLong MR, Hughes DB, Tandon VJ, et al. Factors influencing fellowship selection, career trajectory, and academic productivity among plastic surgeons. *Plast Reconstr Surg.* 2014;133(3):730-6.
9. Stern SA, Kim HM, Neacy K, et al. The impact of environmental factors on emergency medicine resident career choice. *Acad Emerg Med.* 1999;6(4):262-70.
10. Lubavin BV, Langdorf Ml, Blasko BJ. The effect of emergency medicine residency format on pursuit of fellowship training and an academic career. *Acad Emerg Med.* 2004;11(9):938-43.
11. Johnson JP, Cassidy DB, Tofte JN, et al. Orthopedic surgery resident debt load and its effect on career choice. *Orthopedics.* 2016;39(3):e438-e443.
12. Freed GL, Dunham KM, Jones MD Jr, et al. General pediatrics resident perspectives on training decisions and career choice. *Pediatrics.* 2009;123:S26-S30.
13. Neacy K, Stern SA, Hyungjin MK, et al. Resident perception of academic skills training and impact on academic career choice. *Acad Emerg Med.* 2000;7(12):1408-15.
14. Reagan L, Stahmer S, Nyce A, et al. Scholarly tracks in emergency medicine. *Acad Emerg Med.* 2010;S87-S94.
15. Crownto B, Crawford PF. Areas of concentration increase scholarly activity: a 15-month experience. *Fam Med.* 2008;40(2):87-90.
16. Penner AE, Lundblad W, Azzam PN, et al. Assessing career outcomes of a resident academic administrator, clinician educator track: a seven-year follow-up. *Acad Psychiatry.* 2017;41(2):278-81.
17. Jordan J, Hwang M, Coates WC. Academic career preparation for residents – are we on the right track. Presented at the Society for Academic Emergency Medicine Annual Meeting, Orlando, Florida, on May 18, 2017.
18. ACGME accreditation data system. Available at: https://apps.acgme.org/ads/Public/Programs/Search. Accessed August 3, 2017.
19. Society for Academic Emergency Medicine residency directory. Available at: http://www.saem.org/resources/directories/residency-directory. Accessed August 3, 2017.
20. SurveyMonkey. Available at: https://www.surveymonkey.com/. Accessed September 20, 2017.
21. Rickards G, Magee C, Artino AR, Jr. You can’t fix by analysis what you’ve spoiled by design: developing survey instruments and collecting validity evidence. *J Grad Med Educ.* 2012;4(4):407–10.
22. Stern S. Fellowship training: a necessity in today’s academic world. *Acad Emerg Med.* 2002;9(7):713-6.
23. Society for Academic Emergency Medicine. Emergency Medicine: An Academic Career Guide. Available at: https://issuu.com/saemonline/docs/emergency-medicine-academic-career-guide. Accessed August 9, 2017.