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# Scholarly Tracks in Emergency Medicine

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## Abstract

Over the past decade, some residency programs in emergency medicine (EM) have implemented scholarly tracks into their curricula. The goal of the scholarly track is to identify a niche in which each trainee focuses his or her scholarly work during residency. The object of this paper is to discuss the current use, structure, and success of resident scholarly tracks. A working group of residency program leaders who had implemented scholarly tracks into their residency programs collated their approaches, implementation, and early outcomes through a survey disseminated through the Council of Emergency Medicine Residency Directors (CORD) list-serve. At the 2009 CORD Academic Assembly, a session was held and attended by approximately 80 CORD members where the results were disseminated and discussed. The group examined the literature, discussed the successes and challenges faced during implementation and maintenance of the tracks, and developed a list of recommendations for successful incorporation of the scholarly track structure into a residency program. Our information comes from the experience at eight training programs (five 3-year and three 4-year programs), ranging from 8 to 14 residents per year. Two programs have been working with academic tracks for 8 years. Recommendations included creating clear goals and objectives for each track, matching track topics with faculty expertise, protecting time for both faculty and residents, and providing adequate mentorship for the residents. In summary, scholarly tracks encourage the trainee to develop an academic or clinical niche within EM during residency training. The benefits include increased overall resident satisfaction, increased success at obtaining faculty and fellowship positions after residency, and increased production of scholarly work. We believe that this model will also encourage increased numbers of trainees to choose careers in academic medicine.

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Over the past decade, a number of residency programs in emergency medicine (EM) implemented a novel concept in residency education that has been called scholarly tracks or academic colleges. The Council of Emergency Medicine Residency

Directors (CORD) organized a working session during the annual membership meeting to discuss the current use, structure, and success of resident scholarly tracks at the 2009 Academic Assembly meeting. The following is a summary of findings and recommendations of that group.

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The primary objective of residency training in EM is to train competent and caring physicians who meet the American Board of Emergency Medicine (ABEM) standards for certification. Competency in EM is achieved through a program of clinical rotations and didactic experiences. Despite variation among training programs in their content and design, the result achieved is essentially the same—graduation of a competent, independent clinician. Outside of this general training construct is a wealth of clinical, academic, community, and research experiences that have the potential to expose the trainees to the breadth of professional opportunities within our specialty. The Residency Review Committee (RRC) requires that trainees be exposed to and demonstrate involvement in an ever-expanding list of areas outside of the purely clinical arena. This includes the business of medicine, education and teaching, cultural competency, risk management,

and research. Graduating residents now have the potential to develop a robust portfolio that provides evidence of their work in these areas. This may include an administrative project, lectures, a scholarly project, and/or evidence of involvement in performance improvement initiatives.

Residents typically will engage in such work dependent on availability, opportunity, and mentorship, which frequently results in a portfolio that is a veritable hodgepodge of work. An example of this is a graduating senior resident who has demonstrated competency in all of the clinical rotations and core competencies. In addition, he or she may have given core lectures to students or peers on first-trimester bleeding and pediatric limp and conducted research on hypertensive urgencies. His or her performance improvement project may have been investigation of returns to the emergency department (ED) within 72 hours and follow-up of patient complaints. While demonstrating a broad range of competencies, this portfolio does not provide insight into the graduating resident's unique interests or capabilities.

In this age of competition for academic and clinical positions and an emerging emphasis on specialization within our specialty, a number of programs began to investigate the feasibility of focusing the nonclinical efforts of a trainee into a single area of expertise. There were many real and potential benefits. The first is to increase resident competitiveness for clinical faculty and academic positions. The second is to expose the resident to the process of developing a niche. Many residents express the desire to "do research" or "teach," yet have no idea how to take those first steps toward achieving these career goals. While niche development has typically been reserved for fellowship training or academic junior faculty positions, this process can be started as early as the intern year, if provided the appropriate infrastructure and mentorship. The third benefit of this approach is to increase the number of graduating residents going into academics.

Over recent years a number of programs have developed processes by which the career paths of trainees are formed during their residency training. The structure and format vary from program to program and range from a dedicated fourth-year to resident-specific interest tracks and academic colleges within the residency program. The following is a description of the experiences of eight emergency training programs with scholarly tracks.

In anticipation of the 2009 CORD Academic Assembly session devoted to this topic, a survey was sent out to the CORD list-serve. Programs were asked to indicate if they had implemented any version of a scholarly track within their residency training programs. Those that had implemented scholarly tracks were asked to provide information, which included basic program demographics, as well as format-related questions about each program's system. This included basic information such as whether the tracks were mandatory, the time course of resident progression through, and required elements of, the tracks as well as more advanced information such as curricular changes needed to allow for successful implementation, problems encountered, and

reports of outcomes such as career choice. A working group of program directors collated approaches, implementation, and early outcomes and discussion of this topic was held and attended by approximately 80 CORD members. A Medline search was performed to evaluate the literature regarding nonfellowship scholarly tracks in residency programs. Keywords used included both MeSH search terms as well as the keywords residency, fellowship, career choice, education, scholarly project, tracks, and research; these were exploded as well as limited to EM.

Our information comes from the experience at eight training programs (five 3-year and three 4-year programs). Programs range from 8 to 14 residents per year, and two had incorporated academic tracks into their residency as long as 8 years ago.

## **SPECIFIC ELEMENTS**

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### **Scholarly Track Structure**

The track formats used by the participating programs are either the formation of academic colleges with multiple members or individual tracks that reflect the expertise of the involved faculty. Those programs that have adopted the "college" approach have identified research, education, and administration as discrete areas. Although there are multiple diverse projects within each college, resident and faculty benefit from collaboration of all members of the college. The remaining programs have identified track mentors who reflect their own academic interests and create a unique set of track requirements. A representative sampling of common tracks available is listed in Table 1.

Some programs go to lengths to develop tracks around resident interest and expertise and will find mentorship outside the department or institution if necessary to develop a specialty track.

Not all programs require residents to participate in scholarly tracks. For those that do, resident selection of a track is generally in the first half of their training and in a number of programs as early as their internship year. Some residents may switch tracks as their interests evolve, which is supported by most programs.

### **Scholarly Track Requirements**

The requirements of the tracks range from a publishable quality product to simply completion of the requirements of the track. Track requirements usually are the demonstration of expertise within an area and may include teaching efforts, involvement in administrative efforts referable to the topic area, or an independent project. Requirements for both tracks and colleges are listed in Tables 1 and 2.

### **Scholarly Track Implementation**

Programs with academic colleges often meet during conference time in small groups. At one institution, each college is directed by a pair of third-year residents and a faculty mentor. This workgroup plans a schedule of meetings for the year, sets session goals, chooses educational methods, invites guest speakers, and directs the individual meetings. Each meeting features a "works-in-progress" review that promotes experiential

Table 1  
Examples of Scholarly Tracks

Examples of Scholarly Track Topics*	Suggested Track Requirements†	Examples of Scholarly Projects	Career Choices of Graduates
Administration	Identify an area of interest: quality management, patient satisfaction, nursing relations, information technology, reimbursement Complete publishable project within health care administration Participate in a 2-year (120-hour) curriculum covering areas such as quality, information technology, leadership, medicolegal issues, and billing Attend relevant hospital/departmental meetings throughout academic year Quality improvement audits, patient complaint responses Billing and reimbursement audits	Implementation of decision rules into computerized data entry tool Defining role for follow-up nurse Quality improvement project with local presentation Clinical pathway, medical record revision	Community and academic practices with early administrative/legal/operations responsibilities Department director Division head
Austere/disaster medicine	Attendance at hospital/department disaster committee meetings Participate in hospital disaster drills Attendance at the Center for Refugee and Disaster Response Participate in wilderness medicine course Complete publishable project within area	ACEP disaster grant Revise wilderness medicine curriculum Assessment of ED preparedness for pandemic influenza	None yet
Education	Mentor/evaluate students Participate in student education Attend ACEP Teaching Fellowship Participate in 2-year (120-hour) curriculum covering areas such as education research, bedside teaching techniques, administration, curriculum development, and evaluation Development and implementation of new curricular elements for medical student rotation and residency Completion of a high-quality project related to medical education ideally with presentation at education meeting Attend teach-the-teacher programs at Institute for Medical Education	Resuscitation rotation for medical students Web based medical student curriculum Simulation curriculum for students Regional and national poster presentations of educational research including simulation, curriculum evaluations, behavioral change	Directors of undergraduate medical education Robert Wood Johnson Clinical Scholars fellowship Multiple graduates into community affiliates of residencies with a focus on clinical teaching Multiple graduates into university environments. Graduate with ongoing research into simulation techniques
Emergency imaging	Prepare monthly imaging lectures based on core content module topic Quality improvement on ED interpretation of imaging studies	Co-authored paper on focused CT for patients with abdominal pain Imaging competency assessment examination	Academic practice Community practice
EMS	EMS operations working with local EMS agencies as assistant directors Disaster planning training course and regional simulation activities, participate with tactical medical unit EMS education: lectures and training scenarios Participate in EMS quality improvement activities	Participation with aviation, tactical and volunteer EMS agencies EMS paramedic curriculum Presentations at NAEMSP meeting	EMS fellowship EMS agency directors
Global health	Coordinate planning for global health trip Participate in two international clinical experiences Develop and prepare lectures on international health	US in Tanzania International parasitology US education in Liberia Impact of hernia repair on workforce in Sierra Leone	Global health fellowship Academic practice Faculty member of global health division

Table 1  
Continued

Examples of Scholarly Track Topics*	Suggested Track Requirements†	Examples of Scholarly Projects	Career Choices of Graduates
Public health	Participate in environmental health, surveillance, epidemiology and disease control, community wellness, public health emergency preparedness, public health administration Forensic pathology and public health lab Participate in regional emergency vaccination initiative Participate in health department response to commercial aircraft crash	SAEM presentations Manuscript or oral presentation on intersection of EM with public health focus	Health department positions Disaster-preparedness
Research	Execution of a research project under mentorship of member of research faculty Additional curriculum elements (e.g., study design, statistics) determined based on individual needs	SAEM poster presentations AEM publication	PhD in progress Research fellowship
Simulation	Learn to run simulation scenarios Develop simulation scenarios Attend simulation educational meetings nationally Attend institutional teach-the-teacher programs	Simulation evaluation tool Develop simulation curriculum for incoming interns Simulation as a tool for morbidity and mortality	Academic practice Simulation fellowship Director of simulation
Toxicology	Develop toxicology database for department Develop toxicology educational module Prepare educational sessions/lectures in toxicology Poison control rotation	Clinicopathologic case presentation Case report Toxicology lecture bank	Toxicology fellowship
US	Participate in US Course work and US study requirements to be eligible for RDMS examination Teaching medical student and intern US courses Chapter or manuscript Advanced US elective in focus area Monthly scanning shifts with interns Monthly US journal club	US core lectures Development of an US competency examination Co-authored chapters in national textbook Poster presentations of US research Helped develop med student US course US program finances Assessing barriers to US competency Evaluation of ectopic pregnancy evaluation teaching aid US for upper extremity DVT detection	Fellowship in US Ultrasound director RDMS certification International EM practice

ACEP = American College of Emergency Physicians; AEM = *Academic Emergency Medicine*; CT = computed tomography; DVT = deep vein thrombosis; EMS = emergency medical services; NAEMSP = National Association of EMS Physicians; RDMS = registered diagnostic medical sonographer; SAEM = Society for Academic Emergency Medicine; US = ultrasound.  
\*Examples provided are not present at every program. Some programs have tracks which are not listed here.  
†Suggested track requirements are a compilation of requirements provided from various programs and are not the same across programs.

learning, as well as a short didactic presentation for knowledge acquisition within the niche area. Resident college directors learn valuable skills related to curriculum design, adult learning, program evaluation, and the direction of a business meeting.

Conference time can also be used for track mentors to meet with their mentees for the same purpose. Tracks and their requirements may also be incorporated into the internal graduate medical education databases that are used to monitor duty hours and resident evaluations. Outside of using conference time for track

work, some programs have eliminated dedicated blocks that were formerly used for electives, research, and administration. That time is then used to reduce the clinical load of the remaining months of ED shifts and permits a more longitudinal experience than can be acquired in a single month's experience. One program has used this strategy successfully to accommodate an intensive track-based didactic curriculum and maintained a greater than 70% attendance rate for participants without exceeding work-hour restrictions. For those programs where track participation is not

Table 2  
Example of Academic Colleges

Examples of Colleges*	Requirements	Examples of Scholarly Projects	Career Choices of Graduates
Education	Publishable manuscript Attend monthly college meetings One of their three elective months spent on a teaching rotation or conducting curriculum design research Assist clerkship director in development of educational experiences for the medical students	Review article on bedside teaching in the ED Rotating resident curriculum Residency adaptation and testing of the EPEC-EM curriculum Design and feasibility testing of a knowledge translation shift for senior residents Multiple dynamic emergency medicine tutorials EMF grant	Assistant/associate residency director Education fellow Simulation fellow International medicine fellow Toxicology fellow Research fellow Masters in education Masters in biostatistics
Research	Publishable manuscript Attend monthly college meetings Participation in a clinical research study	Time to analgesics for sickle cell patients Health screening on Aconcagua Therapy for acute heart failure Caffeine abuse Triage algorithm for chest x-ray utilization in community-acquired pneumonia Neutropenic fever outcomes	Research fellow Masters in clinical investigation Masters in public health PhD program
Administration	Publishable manuscript Attend monthly college meetings Participation in an operations or administrative scholarly project	SAEM grant Telemetry utilization initiative Cost-effectiveness evaluation of coronary CT angiography Infection control through central line standardization Early goal-directed therapy for sepsis initiative	Health services research fellow Ultrasound fellow Sports medicine fellow Masters in clinical investigation

CT = computed tomography; EMF = Emergency Medicine Foundation; EPEC-AM = Education in Palliative and End of Life Care—Emergency Medicine; SAEM = Society for Academic Emergency Medicine.  
\*All data from Northwestern University.

mandatory for all residents, those residents involved in a track receive a reduction in clinical shift load each EM month for 1 year.

The ultimate commitment to academic tracks is to add a fourth year of training to the program. This is in essence a fellowship equivalent and will allow the trainee to take the momentum of his or her work to date and create a robust portfolio of quality work.

### Resident Acceptance

The overall experience of the participating programs is that residents view the track structure favorably. Only one program has conducted an official survey, performed by PhD students from their school of education. It was performed 2 years after the start of the academic colleges program and suggested that the program had been favorably assimilated into the overall curriculum by resident learners, and was valuable to learners, when compared to performance throughout the graduate schools. The benefits may be as tangible as being competitive for fellowships or academic faculty positions, publication of research efforts, or presentation at academic meetings. For those interested in nonacademic positions, demonstration of expertise in emergency medical services (EMS) or administrative processes sets them apart in their job search. Less tangible benefits are the fact that the nonclinical requirements of the training program are seen as having a purpose and not simply

another check box on their “to-do” list. The ill-defined “scholarly activity” requirement frequently results in minimal efforts projects to simply fulfill the requirement. The residents view the scholarly tracks as being of direct benefit to their growth and training and as a result they often produce work of superior quality.

### Resource Needs

The beauty of the track concept is that it requires no additional resources beyond what programs already have in place for residency training—residents, academic faculty, and specialty niches. The tracks simply organize and focus those elements of training that are already required by the Accreditation Council for Graduate Medical Education (ACGME) training guidelines and raise expectations for faculty and resident involvement and productivity. The biggest resource is always time: time to meet, mentor, and create outside of clinical work. As noted earlier, most programs, even in 3-year formats, have the flexibility to carve out the necessary time allotment; all that remains is commitment and creativity. While this may become harder to accomplish with increasingly stringent duty hours regulations, online communications such as wikis or video chatting may limit the amount of in-person time that is needed, while restructuring of elective, research, or administrative rotations that are already in place may allow for additional time to focus on scholarly work.

## BENEFITS AND OUTCOMES

### Resident Development

Having residents focus in a track has provided the “spark” for certain residents to get involved in academics and develop an area of expertise. Giving residents a taste of academic life is often all they need to make a decision to pursue an academic career.

Residents are better prepared to sell themselves on the job hunt in the world of academics, as well as for their application to postresidency fellowships. Having a work product in a focused area can make a resident stand out as an applicant.

Residents have gained employment based in part on the skills gained while participating in the tracks. This is not simply for residents who are on course to an academic job. Successful programs should match community-bound residents with tracks that can be useful to them in their future careers. An administrative track, for instance, could allow a resident to focus on administrative issues, participate in hospital policy-making and committees that affect the ED, and ultimately prepare a resident for a future position as medical director or chair of an ED. Other areas of focus that have been successful include EMS, ultrasound, and simulation.

### Resident Comments

- “My participation in this program has really helped me in my job search. Department chairs and educators in the departments I’m interviewing at seem very impressed with this program. I think it’s evidence that I am serious in my interest in having educator/administration roles and in two cases so far they have offered resident education or fellowship education positions.”
- “As one who recently completed his job search, I cannot say enough about the value of the administrative track. It was, at many times, the focal point of what was discussed at my interviews. In fact, I believe the track was a big part in my being offered very high level administrative positions as a starting young faculty: ED clinical director of a 70,000 visit ED; and at another institution, vice president of quality and safety of a 700+ bed hospital. I have been very strongly recommending the program to those who have inquired.”

### Faculty Development

A critical element of program success is the longitudinal involvement of faculty mentors. Faculty who commit to track mentorship have the opportunity to serve as content experts and internal reviewers of resident projects through each stage of development. Such work provides opportunities for faculty development, increased understanding of research study design, co-authorship of individual resident or group projects, and mentorship roles that are valued for promotions and tenure.

### Effect on Program Scholarly Productivity

The scholarly work requirement of the RRC can be fulfilled through the work completed in nonclinical tracks.

Residents hear the term “scholarly work” and automatically think research; participation in scholarly tracks can help broaden their understanding of scholarship. While not validated within our field, reports from both family medicine and internal medicine literature state that focused areas of concentration (AOC) increase scholarly activity.<sup>1,2</sup> One family medicine residency compared its pre-AOC publication/presentation numbers ( $n = 1$ ) over 6 years with their 15-month post-AOC publication/presentation numbers ( $n = 12$ ). Many projects within the tracks can be publishable if designed in a thoughtful, “scholarly” manner.

Early data from the participating programs has shown that both the volume and the quality of scholarly work from residents has improved. The group’s consensus is that track implementation results in an increase in number of quality scholarly projects, oral and poster presentations, and papers. Those programs represented in this paper with tracks implemented for more than 3 years found the following:

1. The number of resident presentations at regional and national meetings in the form of oral and poster presentations nearly tripled, and resident-authored papers increased by 50% (B. Nelson, personal communication, Mount Sinai School of Medicine).
2. One program surveyed its residents on numbers of lectures and publications and preparation for academic career in their first track class to historic controls. Track residents felt more confident in their preparation for an academic career than historic controls; 83% of track residents developed a niche versus 64% of controls. Track residents delivered an average of 2.3 unique lectures in their area of interest versus 0.5 per control resident. Forty-two percent of track residents were invited to lecture a faculty audience on their area of interest, compared with 18% of controls. Eighty-three percent of track residents lectured a resident audience in their area of interest, compared to 64% of controls (B. Nelson, personal communication, Mount Sinai School of Medicine).
3. The tracks were implemented in 2002, and prior to that time 24% of graduates entered academics. After track implementation, 38% of all graduates to date have entered academics. Not all residents who entered academics did a formal track, and a small number did an official track and did not enter academics. However, the majority of residents who did a formal track gravitated toward academics (A. Nyce, personal communication, UMDNJ–Robert Wood Johnson Medicine School at Camden).
4. In the 4 years prior to the colleges, 33% of graduates entered academic practice and the number of peer-reviewed publications was 24. In the 4 years after, 67% entered academic practice and the number of peer-reviewed publications was 56 (M. Gisondi, personal communication, Feinberg School of Medicine, Northwestern University).

## CHALLENGES

Some residents are simply more committed to the track concept than others. There are those who simply do

what is required, whereas some do much more. This is no different than what program directors experience now, and they should be ready to deal with residents who are lacking motivation.

Immature tracks may have good concepts and ideas, but can be challenged to have a “publication-worthy” written document. Consideration should be given to expanding the definition of acceptable forms of scholarship to include nonpublication achievements such as curricula, manuals, bedside teaching modules, patents, etc.

The likelihood that multiple residents will chose certain tracks over others is a real concern. Establish support systems so the mentor or leader is able to provide individual residents the attention they each deserve. As stated above, using residents who are already involved in the specialty area is a useful way to take some of the burden off of faculty, especially when a single faculty member is the sole mentor for a group. Additionally, combining tracks where there is logical overlap (for instance, disaster medicine and international EM) can allow for popular tracks and thereby popular faculty to spread the burden of work with others.

## DISCUSSION

While many trainees express an early interest in academic careers, this interest often wanes over the course of training. Neacy et al.<sup>3</sup> found that significantly more residents in their first year were interested in pursuing a career in academics, with this interest level steadily declining as residency progressed. Residents of 4-year programs were 1.45 more times more likely to be interested in academic careers, but only a quarter of residents who planned to pursue academics believed that fellowship training was important to a successful academic career. As only a small percentage of graduates pursue fellowship training (approximately 5%),<sup>4</sup> there must be other factors that influence residents to pursue academic careers.

Sanders et al.<sup>5</sup> published the following factors that were important to residents who pursued academics: desire to do research, desire to teach, academic role models, and a desire to make a contribution to medicine. Scholarly tracks may not only encourage residents who have a baseline interest in academics by providing them with mentors, role models, and focused time, but may also help to sustain the interest of those residents whose academic focus would typically wane during residency. Scholarly tracks can help to spark residents' desires to teach, do research, and contribute—all factors that are noted to be important to residents who choose to pursue academics.

Whether to prepare residents for further fellowship training or simply to give them more focused time and skills to succeed in the world of academic EM, scholarly tracks during residency may offer many of the same benefits that have been credited to fellowship training. Given that a number of fellowships in EM are in nonaccredited subspecialties, there is no standardized format that they follow. The use of tracks may allow residents to fulfill many of the same requirements without the additional time. For tracks in subspecialty areas that

are recognized by ABEM and allow for board-eligibility, early niche development may allow residents to become more competitive candidates for those fellowships, as well as offer them a head start on their academic productivity.

## RECOMMENDATIONS

1. Establish clear goals and measurable objectives that the residents must meet for each track. It is reasonable to have some standard objectives for each track and some modifiable objectives that can be tailored to the individual residents based on their specific interests and career plans.
2. Choose track topics that your faculty are already interested or involved in. It will be much easier to persuade faculty to mentor residents for a number of reasons. First, they have a preset knowledge of the topic. Second, they are more likely to be successful with mentoring residents in topics that they have experience and interest. Third, it will allow faculty to forward their own careers by producing work in their niches.
3. Encourage residents to choose an area of focus early. The earlier a resident can declare a “major,” the more likely he or she will be successful in completion of a scholarly project. When declaration of the track occurs early, programs must also be ready to deal with residents who find they may be better served in another track.
4. Find a way to protect time for faculty and residents to participate in their activities.
5. Establish mentorship for the tracks from both core faculty and involved residents. This will enable residents to not only be productive in their tracks, but will also provide them with experience as both teachers and mentors for more junior residents.
6. Find ways to allow the projects, progress, and accomplishments of each track to be publicized within the residency and department. Progress reports maintain momentum and encourage collaboration and competition. Suggested formats include formal presentations during conference time, graduation awards and publication in departmental newsletters, online blogs, and Web sites.
7. Refine the tracks on a regular basis. The tracks are not static but rather dynamic experiences that require objective reassessment on a regular basis.

The use of scholarly tracks is a novel concept within the field of EM. Anecdotal reports from the programs with graduates from the scholarly track format report increased scholarly work and selection of academic careers. However, future research is needed to compare academic productivity and career choice of residents in programs with scholarly tracks to those without them. In addition, evaluation of the success and productivity of tracks in programs with different formats (Postgraduate Year [PGY] 1–3, 1–4, and 2–4) should be more clearly studied.

Given the limited amount of time most programs have had to collect data (newly introduced concept, lack of graduates from the new format), many of the

recommendations provided are based on anecdotal evidence and consensus agreement. It is also possible that programs that are motivated to incorporate scholarly tracks are more likely to be those with a baseline academic slant and thus attract a more academic applicant. It is unclear if a track system would be successful in an environment where faculty have significantly less productivity in nonclinical areas.

## CONCLUSIONS

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Scholarly tracks encourage the trainee to develop an academic or clinical niche within EM during the course of the typical training period. The benefits are resident satisfaction with the nonclinical training requirements of residency, competitiveness for clinical, faculty, and fellowship positions and increased production of high-quality scholarly work. We also hope that the tracks will encourage increased numbers of trainees to choose careers in academic medicine.

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