Title
Three- vs. Four-Year Emergency Medicine Training Programs

Journal
Journal of Emergency Medicine, 57(5)

ISSN
0736-4679

Authors
Ross, Teresa M
Wolfe, Richard E
Murano, Tiffany
et al.

Publication Date
2019-11-01

DOI
10.1016/j.jemermed.2019.07.013

Peer reviewed

Three- Vs. Four-Year Emergency Medicine Training Programs

Teresa M. Ross, MD,*† Richard E. Wolfe, MD,‡ Tiffany Murano, MD,§ Paul Alleyne, MD, Pam L. Dyne, MD, Mohamad Ali Cheaito, MD,** Shahram Lotfipour, MD, MPH,†† and Amin Kazzi, MD**††

*Virginia Hospital Center, Arlington, Virginia, †Georgetown University School of Medicine, Washington, DC, ‡Beth Israel Deaconess Medical Center, Harvard Medical School, Boston, Massachusetts, §Rutgers New Jersey Medical School, Newark, New Jersey, Division of Emergency Medicine, Temple University Hospital, Philadelphia, Pennsylvania, Emergency Medicine, David Geffen School of Medicine, University of California, Los Angeles, California, **Department of Emergency Medicine, University of California, Irvine, California, and ††Department of Emergency Medicine, American University of Beirut Medical Center, Beirut, Lebanon

Reprint Address: Amin Kazzi, MD, MAAEM, FAAEM, Department of Emergency Medicine, American University of Beirut Medical Center, PO Box 110236, Riad El Solh, Beirut, 1107 2020, Lebanon

Abstract—Postgraduate training in emergency medicine (EM) varies in length among different programs. This fact creates a dilemma for applicants to the specialty of EM and prevents EM educators from reaching a consensus regarding the optimal length of training. Historically, EM training existed in the postgraduate year (PGY) 1–3, 2–4, and 1–4 formats, until the PGY 2–4 program became obsolete in 2011–2012. Currently, three-quarters of EM programs follow the PGY 1–3 format. In this article, we clarify for the applicants the main differences between the PGY 1–3 and PGY 1–4 formats. We also discuss the institutional, personal, and graduate considerations that explain why an institution or an individual would choose one format over the other.

INTRODUCTION

The length of postgraduate training has been standardized by almost all of the medical specialties. Only plastic surgery, vascular surgery, and emergency medicine (EM) stand out in allowing the use of different training formats (1). In fact, their opinions seem to be influenced by the length of training in both the programs they currently direct and the programs at which they trained (2). Applicants are often torn between the desire to reach professional competency, the appeal of beginning a lucrative specialty practice, or pursuing fellowship training. Which is best? The evidence to help answer this question remains sparse. Standardization seems desirable to ensure a shared vision of what makes an emergency physician a true specialist in the field. In times of strained resources for health care, there is also a growing need to balance training resources with an active emergency department (ED) workforce. However, despite some evolution, the percentage of programs opting for 3 vs. 4 years of training has not changed significantly in 20 years.

DISCUSSION

Historically, EM training existed in three different formats (postgraduate year [PGY] 1–3, 2–4, and 1–4), each with perceived advantages and disadvantages (3,4). However, the PGY 2–4 format became obsolete in the academic year 2011–2012 (5). Currently, the PGY 1–3 programs dominate, comprising 75% of the existing training programs. Both the PGY 1–4 and PGY 2–4 formats require 4 years of training (5). Fundamentally, the PGY 2–4 programs required an internship in a field other than EM, usually internal medicine, surgery, or a transitional year followed by a 3-year residency in EM, starting as a PGY-2 resident. This model underwent a steady decline over the past 20 years before it became obsolete (5). Reasons for this decline include a decrease in the number of preliminary internships offered, as well as the decision by the Accreditation Council of Graduate Medical Education (ACGME) resulting in two formats, PGY 1–3 and PGY 1–4. The PGY 1–4 format, however, has grown steadily during the same time frame. It has been adopted as the model for new programs at several major academic centers (e.g., Harvard, Yale, University of Pennsylvania, University of California, San Francisco) and was a natural transition for PGY 2–4 programs looking to encompass the first year of training under the supervision of EM. Table 1 displays the number of programs and ACGME-approved positions for both the PGY 1–3 and PGY 1–4 formats (5).

Table 1. Number of Programs and ACGME-Approved Positions for Both the PGY 1–3 and PGY 1–4 Formats*

Format	Percent of Programs (Number)	Number of ACGME-Approved Positions
PGY 1–3	75% (165)	1826
PGY 1–4	25% (56)	674
Total	100% (221)	2500

ACGME = Accreditation Council of Graduate Medical Education; PGY = postgraduate year.
* Nelson LS, Keim SM, Baren JM, et al. American Board of Emergency Medicine Report on Residency and Fellowship Training Information (2017-2018). Ann Emerg Med 2018; 71:636–48 (5).

Evolution of the EM Residency Programs' Structure

The first board in EM in 1979 unanimously felt that 3 years of training were needed to cover the skills and knowledge unique to EM (6). Because many programs at that time accepted applicants only after a general rotating internship, two models—PGY 1–3 and 2–4— were adopted. A number of the PGY 2–4 programs realized that incorporating the internship year into their model could be advantageous, which led to the development of the specialty-specific PGY 1–4 format. This led to the continual retrogression and eventual extinction of the PGY 2–4 format in 2011–2012 (5). The first board in EM was concerned that if 4 years became mandated, many other young programs would close if they could not match the design of the additional

intern year. Although a unified model of training would simplify the problem, there is significant legacy already ingrained in some programs.

Data are limited regarding the impact of an additional year of training on a physician's clinical skills (4). However, according to a study by Hayden and Panacek, the total mean index procedure sum per graduating resident was higher among graduates of PGY 1–4 programs (7). More specifically, graduates of PGY 1–4 had significantly more experience with diagnostic peritoneal lavage, pediatric medical resuscitation, and adult trauma resuscitation. Nonetheless, the few statistically significant differences in procedure experience may be attributed to the 4 years worth of procedural experience in PGY 1–4 programs (7). Also, residents who complete a 3-year program meet credentialing requirements for taking the qualifying written board examination. So why should an EM applicant invest an extra year of training? And why would a department design a longer program than required? Talking points for each format are both personal and complex, and little evidence exists to support a clear measurable benefit of one format over another (3,4). Evidencebased answers to these questions may well be provided in the near future by ongoing studies such as the American Board of Emergency Medicine (ABEM) Longitudinal Study of Emergency Residents, which has been gathering resident surveys annually since 1996 (8,9).

All EM training programs, regardless of their format, share common goals: to address the needs of emergency patients, ensure a long and rewarding professional career for graduates, and prepare graduates for the future challenges of the specialty. One is sure to receive excellent clinical training at any EM program in the country. Every program is evaluated and approved by the ACGME and meets prerequisites to sit for the written and oral specialty board examination given by the ABEM or the American Osteopathic Board of Emergency Medicine (10,11). The minimum required length of an EM program is 36 months, or 3 years (6). Beyond this, the design of each training program is often supported by the program's individual mission statement.

Institutional Considerations

An institution's decision regarding the length of training can be influenced by financial, staffing, and training considerations. On one hand, a 4-year program provides a longer, continuous, mature work force for managing care in the hospital's ED. According to experts in the field, senior residents in 4-year programs may require less supervision, make fewer errors, and effectively care for greater numbers of patients. This subsequently reduces the number of attending physicians needed to supervise residents, which has a potential economic advantage for the institution. However, allowing senior residents to manage the ED as a lone supervisory physician has become increasingly difficult due to the enforcement of the Centers for Medicare and Medicaid Services, formerly known as the Health Care Financing Administration. They require attending contact and real-time supervision on all patients to bill Medicare for their care (12). Nonetheless, experts in the field believe that senior residents in all programs can act in supervisory roles that help them develop critical skills in organization, efficiency, teaching, and team leadership. For this reason, an additional year of training can still be beneficial for

polishing techniques for rapid and effective patient flow. Additionally, the added year of training allows EM residents to shift their focus mainly from gaining clinical skills and competencies to learning how to better establish ownership of their patients. It also provides residents with an additional year of experience, mentorship, and elective opportunities, which may help mold a more mature graduate.

These advantages are counterbalanced by the fixed number of resident positions allocated to each hospital and the reduced institutional reimbursement for residents beyond the PGY-3 of training. Reduced government funding in the fourth year may potentially place the final year of a PGY 1–4 program in jeopardy. For any training year beyond the certified 3-year EM residency, only 50% of graduate medical education funds are compensated by Medicare (13). Therefore, some institutions might resist adding a fourth year to their EM training programs, for taking on fourth-year residents can incur a financial burden on the institution. Accordingly, a PGY-4 year may seem less profitable to institutions looking to expand their EM program or other residencies within the hospital. Similarly, the institutional cap on the number of resident positions places 4-year programs at risk to have their resident roster downsized, or to transform into a PGY 1–3 format to allocate those positions to programs in other specialties.

Moreover, the Residency Review Committee requires clear justification for the longer format (14–16). As such, Ketterer et al. developed six additional competencies that may be used by EM training programs to justify the additional training time in their programs (14). In view of this, program directors committed to 4 years of training are drawn to this viewpoint by their educational mission rather than by competitive or financial advantages.

Personal Considerations

From the trainee's perspective, a shorter training format might seem more efficient. There is a natural desire, particularly for people with an affinity for EM, to get things done quickly and to reach independence rapidly. Furthermore, the PGY 1–3 format is by far the most common (75% of all EM programs) (5). Nationally, graduates from 3and 4-year programs had no significant difference in the ABEM qualifying examination pass rates (2). This has led to speculation that the additional year of training would not result in improved performance on the certifying ABEM boards. However, no formal study has compared official pass rates of graduates in the different training formats, nor have studies correlated test scores with clinical acumen and overall professional competency. ABEM examinations are criterion referenced tests and are not meant to be interpreted as measuring better training (17).

The PGY 1–3 model can offer financial advantages for trainees as well, allowing graduates to collect full attending salary 1 full year earlier than their colleagues in 4-year programs. This can be an important factor. Some residents may not have the cars, houses, or savings that their nonphysician peers may have. Unlike other careers, physicians sacrifice early income for the professional rewards of medicine, and secondarily, for the associated prestige and job security. The debt load and restricted lifestyle during residency can be harsh in comparison with other fields. This is further exacerbated by the fact that the debt load of EM applicants has been reported higher than for other medical specialties (1,18,19). Rising financial pressures from prolonged training can add to the stress felt by both residents and their families. Graduates of 4-

year programs receive resident salary for an extra year and may postpone yet another year of loan payments and interest accumulation. The flip side argues that graduates of 4-year programs may end up more highly compensated over the long term, landing higher-paying jobs or enjoying longer careers than those graduating from a 3-year program. With that being said, there has been little research regarding starting salaries of EM graduates related to residency program. One study, however, did find that location still takes precedence over salary when choosing a place of employment (20).

On the other hand, trainees in 3-year models potentially lose elective time (21). Elective opportunities for EM residents are diverse. These may include research, ultrasound, hyperbaric medicine, wilderness medicine, and international EM electives. The time constraints of a 3year program limit these optional experiences, which could possibly stimulate interest for future fellowship training. In addition, shorter programs have less time to cover the core content. This leads to a faster pace of teaching, which is not for everyone and can result in stress, frustration, and depression. With a finite time to learn ''everything,'' it has been argued that opportunities to manage certain cases and perform procedures are offered directly to an intern in a PGY 1–3 program, whereas 4-year programs may delay the opportunity for more senior residents. However, the number of cases, procedures, and supervisory experiences is ultimately based on the volume and acuity of the patient base. Additionally, expertise and seniority are a function of direct experience rather than simply time in training.

Programs with PGY 1–4 formats vary in their design. They typically offer more elective time or off-service rotations (21,22). Some may spread the entire curriculum over 4 years, whereas others may design the fourth year to be a ''sub-attending'' or ''pre-attending'' year with protected time for a scholarly project or research. For residents with academic aspirations, there can be more time to initiate and complete research projects.

Graduate Considerations

Graduates from a 4-year program may have an advantage when it comes to applying for jobs. Some believe that those who have completed a fourth year of training are more confident in decision-making and dispositions than their 3-year counterparts. A counter-argument suggests that 1 year as an attending negates this ''confidence gap'' (23). However, equating a year in training to a year in practice questions the validity of graduate medical education altogether. Advocates of the 4-year training model believe this confidence gap may never be breached without the additional year of formalized mentoring. Regardless of academic aspirations, 4-year proponents argue that the fourth year of training is critical in the increasingly complex world of EM. The final year offers more time for structured learning, clinical experience, and time to gain self-confidence (23). One thing that's fairly certain is that a graduate from a 3-year training program will rarely be an immediate candidate for an academic position at an institution with a 4-year program. This may be due to potential conflicts with a new faculty member from a 3-year program who is the equivalent of a PGY-4 level having a supervisory role over senior residents who are also at the PGY-4 level. However, this does not prevent a 3-year graduate from holding an academic appointment at an institution with a 3-year program. It simply means that the choice of academic centers is more restricted early on when graduating from a PGY 1–3 model.

As for fellowships, it is safe to say that many feel a fellowship greatly facilitates obtaining an academic job. With this in mind, academic-bound applicants could find it more efficient to train in a 3-year program plus the fellowship rather than a 4-year program. Four-year

programs can offer designated time for personal projects and research in the final year, which can help create a nice practice niche for the physician. However, it does not count as a formal fellowship. Curiously, the evidence suggests that despite the appeal of a 3-year model before fellowship, residents are more likely to do a fellowship or pursue an academic career if they have completed 4 years of training, specifically in a PGY 1–4 format (15). Some suggest that the 4-year model allows more time to prepare the resident for an academic career because there is more time to develop research and administrative skills well beyond the core clinical skills. A survey of program directors found an association between residency format and pursuit of an academic career, though the associated size effect was modest. For graduates of EM residency from 1995– 2000, more 4-year graduates pursued academics initially. The percent of graduates pursuing academics was 34.2%, 28.5%, and 18.6%, and fellowships 8.6%, 5.6%, and 4.3% for PGY 1–4, 2–4, and 1–3, respectively (24). However, scholarly tracks can be found in both 3and 4-year programs, suggesting that mentorship for an academic career can again be program-specific. Regan et al. reviewed some specific scholarly tracks that have been developed in both 3-year and 4-year programs (25). They concluded that these scholarly tracks provide residents the opportunity to develop an academic or clinical niche (25).

Table 2 summarizes the differences between 3and 4year EM programs.

Table 2. Summary of the Differences Between Three- and Four-Year Programs

Aspect	3-Year Program	4-Year Program
% of all programs	75%	25%
MIPS per graduating resident	Less	More
Likelihood of perusing a fellowship	Less	More
Likelihood of perusing an academic career	Less	More
Candidature for an academic position at an institution with a four-year program	Less	More
Elective time or off-service rotations	Less	More
GME funds	Completely compensated by Medicare	Only 50% of GME funds are compensated by Medicare for the fourth year
ABEM qualifying examination pass rates	No difference	No difference

ABEM = American Board of Emergency Medicine; GME = graduate medical education; MIPS = mean index procedure sum.

CONCLUSION

In the end, how poised and independent a senior resident becomes is more likely to be a reflection of how well the resident is educated during his or her residency, rather than the length of training. The reputation of a program and its director are often affected by the skills of their weakest graduates. From the perspective of a program director, the 4-year model can have substantial advantages in ensuring that their graduates are well prepared. Added training can allow time to identify residents in need of remediation and intervene to ensure competency. At

the same time, there are true medicolegal and financial limitations to keeping residents for an additional year. The market, as defined by Medicare reimbursement and the majority volume of applicants perpetuates the predominance of the PGY 1–3 model. However, many leaders of the field committed to the 4 years of training are afraid that the 3-year model will weaken us and impair our competitiveness in relation to other medical specialties. Time and the market will ultimately provide the final solution to this debate. In the meantime, applicants seek what is the best fit for them. In a 2006 ABEM study of residents, 94% felt their program was either very much like what they wanted or at least somewhat like they wanted. Ninety-one percent indicated that their program had met most of their expectations or exceeded their expectations, with the remainder indicating that the program had met at least some of their expectations (9).

Acknowledgments—This research received a nonrestricted educational grant from the not-for-profit Resident Student Association (American Academy of Emergency Medicine) and the Department of Emergency Medicine at the American University of Beirut. The funding sources were not involved in the preparation of the article, writing of the report, or decision to submit the article for publication.

REFERENCES

1. American College of Graduate Medical Education (ACGME). Reports: list of programs by specialty. Available at: http://www. acgme.org/adspublic/. Accessed February 2, 2019.
2. Hopson L, Regan L, Gisondi MA, Cranford JA, Branzetti J. Program director opinion on the ideal length of residency training in emergency medicine. Acad Emerg Med 2016;23:823–7.
3. Lotfipour S, Luu R, Hayden SR, Vaca F, Hoonpongsimanont W, Langdorf M. Becoming an emergency medicine resident: a practical guide for medical students. J Emerg Med 2008;35:339–44.
4. Langdorf M, Lotfipour S. Advantages of a three-year residency. Cal J Emerg Med 2004;5:15.
5. Nelson LS, Keim SM, Baren JM, et al. American Board of Emergency Medicine Report on Residency and Fellowship Training Information (2017–2018). Ann Emerg Med 2018;71:636–48.
6. Suter RE. Emergency medicine in the United States: a systemic review. World J Emerg Med 2012;3:5–10.
7. Hayden SR, Panacek EA. Procedural competency in emergency medicine: the current range of resident experience. Acad Emerg Med 1999;6:728–35.
8. American Board of Emergency Medicine (ABEM). Longitudinal Study of Emergency Medicine Residents (LSEMR). Available at: https://www.abem.org/public/resources/research/longitudinalstudy-of-emergency-medicine-residents-(lsemr). Accessed April 21, 2019.
9. American Board of Emergency Medicine (ABEM). Satisfaction among Emergency Medicine Residents in 2006. From the Longitudinal Study of Emergency Residents (LSEMR) Overview. Available at:

http://www.abem.org/PUBLIC/portal/aliasRainbow/langenUS/ tabID3889/DesktopDefault.aspx. Accessed February 2, 2019.

10. Schmitt A, Dyne PL, Broder J, et al. An overview of the allopathic match. J Emerg Med 2019;56:e61–4.

11. Hansen E, Pilarski A, Plasner S, Cheaito MA, Epter M, Kazzi A. The osteopathic applicant. J Emerg Med 2019;56:e65–9.

12. Centers for Medicare and Medicaid Services (CMS). Guidelines for teaching physicians, interns, and residents. 2018. Available at: https://www.cms.gov/Outreach-and-Education/Medicare-LearningNetwork-MLN/MLNProducts/Downloads/Teaching-PhysiciansFact-Sheet-ICN006437.pdf. Accessed June 25, 2019.

13. Association of American Medical Colleges (AAMC). Medicare payments for graduate medical education: what every medical student, resident, and advisor needs to know. 2003. Available at: https://aamc-black.global.ssl.fastly.net/production/media/filer_ public/64/77/6477adae-c4c6-4e0e-8c6f-adcdabf2bdec/dgme_-_ medicare_gme_payments_what_you_need_to_know_-_201904 30.pdf. Accessed August 3, 2019.

14. Ketterer AR, Salzman DH, Branzetti JB, Gisondi MA. Supplemental milestones for emergency medicine residency programs: a validation study. West J Emerg Med 2017;18:69–75.

15. Accreditation Council for Graduate Medical Education (ACGME). Program requirements for graduate medical education in emergency medicine. Available at: https://www.acgme.org/Specialties/ProgramRequirements-and-FAQs-and-Applications/pfcatid/7/Emergency. Accessed September 8, 2018.

16. The American College of Emergency Physicians (ACEP). For continued accreditation – undersea and hyperbaric medicine. Available at: https://www.acep.org/globalassets/uploads/uploaded-files/ acep/membership/sections-of-membership/hyper/fellowship/acgmeaccred.pdf. Accessed April 21, 2019.

17. American Board of Emergency Medicine (ABEM). Examination criterion and scoring. Available at: https://www.abem.org/public/becomecertified/qualifying-exam/results-scoring. Accessed September 20, 2018.

18. Park R. Graduating medical students' debt and specialty choices. Acad Med 1990;65:485–6.

19. Kassebaum DG, Szenas PL. Relationship between indebtedness and the specialty choices of graduating medical students: 1993 update. Acad Med 1993;68:934–7.

20. Steele MT, Schwab RA, McNamara RM, Watson WA. Emergency medicine resident choice of practice location. Ann Emerg Med 1998;31:351–7.

21. Gottlieb M, Arno K, Kuhns M, Chan TM. Distribution of clinical rotations among emergency medicine residency programs in the United States. AEM Educ Train 2018;2:288–92.

22. Sloan EP, Strange GR, Jayne HA. United States emergency medicine block rotation curricula for the 1986–87 academic year. Ann Emerg Med 1988;17:1049–57.

23. Weichenthal L. Advantages of a four-year residency. Cal J Emerg Med 2004;5:18–9.

24. Lubavin BV, Langdorf MI, 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.

25. Regan L, Stahmer S, Nyce A, et al. Scholarly tracks in emergency medicine. Acad Emerg Med 2010;17(suppl 2):S87–94.