

U.S. Allopathic Emergency Medicine Residency Programs: A Descriptive Review

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Abstract

Objective: To use collected data from all 124 allopathic emergency medicine residency (EMR) programs in existence in 2001 to describe allopathic EMR training programs in the United States. **Methods:** The authors performed a cross-sectional review of all 124 EMRs using self-reported, standardized data from regularly updated sources: the SAEM Residency Catalog and the AMA's FREIDA (Fellowship and Residency Electronic Interactive Database Access). The authors report median values, ranges, and interquartile ranges (IQRs) on a variety of variables. **Results:** Median values for EMR programs included a class size of 10 per year; a total faculty-to-resident ratio of 0.78 (1:1.29); an annual primary emergency department (ED) census of 66,000 (IQR = 53,000 to 80,000), with an annual combined primary and secondary ED census of 95,500 (IQR = 75,000 to 126,000); a combined pediatric census of 20,000 (IQR = 15,000 to 32,500) at the primary and secondary sites; an

annual combined ED visit per resident of 3,181 (IQR = 2,542 to 3,949), including 733 pediatric visits per resident, at the primary and secondary sites; an admission rate of 20% (IQR = 17% to 23%); and an intensive care unit admission rate of 13% (IQR = 5% to 20%). Despite a wide variability in ranges and IQR in most characteristics pertaining to training setting, the overall reported completion rate of training for residents was high (99%). **Conclusions:** This summary description provides median values and ranges for important components of the emergency medicine training environment and provides a basis of comparison for medical students and graduate medical educators. **Key words:** emergency medicine residency (EMR); graduate medical education; emergency medicine (EM); residency selection; residency review; residency training. *ACADEMIC EMERGENCY MEDICINE* 2003; 10:901-903.

Basic demographic and census characteristics of the allopathic emergency medicine residencies (EMRs) have not been well described or presented in a way that provides a basis for comparison. The purpose of this study is to describe the current EMR training environment using self-reported data and to provide a numerical basis of comparison for medical students and graduate medical educators in emergency medicine (EM).

METHODS

Study Design. This is a cross-sectional, descriptive review of U.S. allopathic EMR training programs using publicly accessible demographic and census data from two databases.^{1,2} The study received a waiver from the institutional review board.

Study Protocol. Data were collected from December 2001 to January 2002 using the SAEM Residency

Catalog and the AMA's FREIDA (Fellowship and Residency Electronic Interactive Database Access) in multiple categories for each of the 124 EM allopathic residencies in the United States.^{1,2} These residency databases use self-reported annual survey data from residency programs to standardized demographic, census, and personnel questions. The information can be updated by residency programs on a continual basis by phone or e-mail. Both sources function to provide residency training information to medical students and graduate medical educators, but neither source allows the user to search by specific variables or facilitates direct comparison.

Measures. Abstracted variables included self-reported program type (university, community, or military), location, program length, departmental status, military affiliation, adult and pediatric emergency department (ED) census at primary and secondary training sites, number of hospital and ED beds at the primary institution, number of total admissions at the primary institution, acuity data (percentages of ED patients admitted to the hospital and to the intensive care unit), number of ED faculty, presence of combined programs, number of other residencies and fellowships at the institution, helicopter experience, number of positions and of applications for the previous year, intern salary, and graduation percentage.

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Data Analysis. Data were entered into a Microsoft Excel spreadsheet (Redmond, WA) for statistical analysis. The database created includes sorting and search functions and has been described previously.³ We report median values, ranges, and interquartile ranges (IQRs) for continuous variables. Categorical data are reported as percentages.

RESULTS

We reviewed and compiled comparative, self-reported demographic data from all 124 U.S. allopathic EMRs. Eighty-seven (70%) identified themselves as university programs; 32 (26%), as community hospital based; and 5 (4%), as military programs. Three-year programs represented most (73%) EMRs. Eleven programs (9%) offered combined certification in internal medicine or pediatrics. Most programs (79%) reported departmental status within the institution. The median number of reported hospital beds and ED beds at the primary training site was 588 (range 150 to 1,200; IQR = 439 to 748) and 33 (range 16 to 100; IQR = 28 to 45) beds. All EMRs were located at hospitals with other residency or fellowship programs, with the median number being 33 (IQR = 15 to 48). The number of EM faculty ranged from 8 to 65 with a median of 24 (IQR = 18 to 35). The median total faculty-to-resident ratio was 0.78 or 1:1.29 (range 0.31 to 2.71; IQR = 0.61 to 1.04). Fifteen years was the current median duration for U.S. EMRs (IQR = 7 to 23 years). Table 1 depicts census and acuity data.

The median number of positions in the first-year residency class was 10 (IQR = 8 to 12) with a minimum of 6 (12 programs) to a maximum of 18 (2 programs) first-year residents. The median number of applications for first-year residency slots received for the previous year was 435 (range 27 to 1,000; IQR = 302 to 550). The median reported percentage of residents completing a residency program was high at 99% (range 83% to 100%; IQR = 96% to 100%). Most (85%) of EMR programs offered an aeromedical experience either as a core component or as an elective. The median starting intern salaries for the 2001–2002 academic year was \$36,538 (range \$25,380 to \$45,087; IQR = \$35,472 to \$38,570).

DISCUSSION

This study suggests that EMR training is carried out in diverse settings, and it provides some basis of comparison for medical students and graduate medical educators on key elements of residency training in EM. This study is unique in that, to the best of our knowledge, it is the first to compare important variables across all U.S. allopathic EM training programs. A searchable database of EMR programs has been reported previously that allows users to perform multivariable sorts and rank order but is not widely available.³ Currently, information about residency programs is available but has never been integrated to facilitate meaningful comparison. Rubio et al.⁴ compared curricula at EMR programs and concluded that there is considerable variation in curriculum, exposure to subspecialties, and elective opportunities but provided no information on ED volume, acuity, or faculty.⁴ The American Board of Emergency Medicine annual report on residency training provides insight but focuses on demographic trends in EM house officers.⁵ The Accreditation Council for Graduate Medical Education and the Emergency Medicine Residency Review Committee (RRC-EM) requirements have specific minimums for dedicated or core faculty, ED volume, total pediatric experience, and acuity, but these represent minimum standards based on expert consensus only.⁶ The RRC-EM special requirements call for a minimum of one core physician faculty member for every three residents in the program until the total resident complement exceeds 30. They also recommend that the primary clinical site and other EDs where residents rotate for four months or longer should have at least 30,000 ED visits annually, that the pediatric experience be at least 16% of all encounters or four months of full-time-equivalent experience, and that the care of the critically ill at the primary clinical site should constitute at least 3% or 1,200 ED visits per year.⁶

Medical students use numerous resources to collect information on EMRs, but all of these sources lack scientific analysis and global comparative review.^{7,8} Reporting the median values and ranges of common aspects in EMR may allow medical students interested in the field to make more informed decisions.

TABLE 1. Volume and Acuity Characteristics of U.S. Allopathic Emergency Medicine Residencies

Category	Location	Median	Range	Interquartile Range
ED census	Primary ED	66,000	31,700–170,000	53,000–80,000
	Primary and secondary ED sites	95,000	39,000–206,000	75,000–126,000
ED census per resident	Primary ED	2,289	667–4,667	1,829–2,764
	Primary and secondary ED sites	3,181	1,250–8,375	2,542–3,949
Pediatric census	Primary and secondary ED sites	20,000	10,000–80,000	15,000–32,500
Pediatric census per resident	Primary and secondary ED sites	733	150–1,200	482–1,000
Total admissions	Primary hospital	24,996	7,406–67,412	18,583–30,335
Admission rate from ED	Primary ED	20%	6–60%	17–23%
ICU admission rate from ED	Primary ED	10%	1–57%	5–20%

ED = emergency department; ICU = intensive care unit.

It also provides program directors with a numerical basis of comparison with which to assess their own program resources based on aggregate data.

LIMITATIONS

There were several limitations to our study. The data were self-reported by the residency programs, but the accuracy was not verified independently. Bias could have been introduced by inflation or inaccuracy of reported numbers. The format of the questions did not allow the programs to describe themselves fully and allowed for potential variability in interpretation. The three possible program descriptors (university, community, and military) left out additional setting designations, such as urban, suburban, or rural. Similarly, no subanalysis could be performed on clinical faculty because only total faculty was reported by programs. This may include nonclinical or part-time faculty as well as full-time or core faculty. The designation of intensive care unit admission was open to the respondents' interpretation and might include all admissions to monitored beds, step-down units, or full intensive care bed status. The study data report the total numbers of patients available to the residents but do not allow calculation of an actual number or percentage seen by residents. In addition, the study limited data collection to only the primary and secondary institutions. Several programs trained residents in EDs at more than two institutions, but the relative infrequency of this and our large sample size limited any potential skew. Lastly, the data set was incomplete in several categories because some programs did not report data. Although most data were acquired in

nearly every category, the results could be strengthened if complete data were available.

CONCLUSIONS

This review of EMR training environments using readily accessible, self-reported data facilitates future comparison and study. It highlights the high degree of variability in training environments, while providing an initial attempt at quantifying key components of allopathic EM residents' experience.

References

1. AMA's FREIDA online. Available at: www.ama-assn.org/ama/pub/category/2997.html. Accessed Dec 2001/Jan 2002.
2. SAEM's catalog of emergency medicine residencies. Available at: www.saem.org/rescat/contents.htm. Accessed Dec 2001/Jan 2002.
3. Lathrop G, Wilkinson KC. The EM residency comparison database: a searchable database for allopathic EM residencies. *Acad Emerg Med.* 2002; 9:1056.
4. Rubio CK, Barber K, Wolford RW. Emergency medicine residencies: a descriptive study of program. *Acad Emerg Med.* 2000; 7:1166-7.
5. Hoffman GL, Bock BF, Gallagher JE, Hamm HP, Reinhart MA. Report of the task force on residency training information (2000-2001), American Board of Emergency Medicine. *Ann Emerg Med.* 2001; 37:515-32.
6. ACGME program requirements for residency education in emergency medicine. Available at: www.acgme.org/req/110pr101.asp. Accessed May 13, 2002.
7. Koscove EM. An applicant's evaluation of an emergency medicine internship and residency. *Ann Emerg Med.* 1990; 19:774-81.
8. Perron AD, Brady WJ. Sources of information on emergency medicine residency programs. *Acad Emerg Med.* 2002; 9:1462-3.