



MEDICAL STUDENT EDUCATION

Third-year Medical Student Rotations in Emergency Medicine: A Survey of Current Practices

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Abstract

Objectives: Exposure to emergency medicine (EM) is a crucial aspect of medical student education, yet one that is historically absent from third-year medical student training. There are limited data describing the existing third-year rotations. The goal of this study is to identify the content and structure of current EM rotations specific to third-year students.

Methods: An institutional review board–approved survey of clerkship characteristics was designed by consensus opinion of clerkship directors (CDs). The survey was distributed to 32 CDs at institutions with known EM clerkships involving third-year students.

Results: Twenty-three (72%) CDs responded to the survey. Sixty-five percent have rotations designed specifically for third-year students, of which 33% are required clerkships. Twenty-seven percent of rotations have prerequisite rotations; 37% of rotations include shifts in the pediatric ED. Clinical time averages four 8-hour shifts per week for 4 weeks; all rotations include weekly didactic time specific to third-year students. A wide variety of textbooks are used; some programs employ simulation labs. Two-thirds of the rotations have a required write-up or presentation; 53% include a final exam. Student evaluations are written and verbal. Most rotations receive more support from the EM departments than from the medical schools for physical space, administrative needs, and faculty time. Among those surveyed, students from institutions requiring a third-year EM rotation have a higher rate of application to EM residencies.

Conclusions: There is variability in the content and structure of existing third-year EM rotations, as well as in financial and administrative needs and support. These data can help to inform CDs and departments that are starting or modifying EM third-year rotations, as well as contribute to the development of curricula for such rotations.

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Emergency medicine (EM) rotations provide students with a unique experience in the spectrum of patient care.^{1–3} Students have the opportunity to be on the front line of assessing and managing the “undifferentiated patient,”⁴ who presents with an acute illness or injury. Previous work has shown that EM is underrepresented in medical student education, given its

tremendous educational value.^{5,6} The Macy Foundation Report in 1994⁷ created the educational expectation that medical students learn to care for patients with medical emergencies.⁸ The Liaison Committee for Medical Education (LCME) subsequently addressed this gap through accreditation standards, recommending opportunities in “multidisciplinary content areas,” such as EM.⁹

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In the 2007 “State of the Clerkship” survey,¹⁰ clerkship directors (CDs) at EM residency programs accredited by the Accreditation Council for Graduate Medical Education (ACGME) looked at the prevalence of the EM clerkship. The results revealed that of 132 EM rotations at allopathic medical schools in the United States at the time, 65% accepted only fourth-year students, while 35% were open to both third-year and fourth-year students. This study, however, did not differentiate institutions offering rotations designed specifically for third-year students alone. The results of a revised “State of the Clerkship” survey, expected in 2011–2012, will provide an update on the EM clerkships at current allopathic medical schools across the country, as identified by the LCME.¹¹ However, it also is not designed to separate rotations specifically for third-year students (D. Manthey, MD, lead author, personal communication, June 4, 2010).

Previous literature has focused on the education of the fourth-year medical student rotating in the ED.^{8,10,12} A curricular guide for a fourth-year student EM clerkship was created by a collaborative task force of the six major EM organizations, initially published in 2006⁸ and revised in 2010.¹² This curricular guide is specific to fourth-year students in terms of the complexity of clinical experience, core content, procedures, and evaluation processes. Since the clinical competence of fourth-year students who have completed core rotations is very different from that of third-year students beginning clinical training, the applicability of this curriculum to third-year students is limited.

The purpose of our research is to gather information from institutions involving third-year medical students in EM clerkships with two specific goals in mind. The first goal is to determine which schools have 2010–2011 rotations that are designed specifically for third-year students and to distinguish them from the schools that allow the third-year student into their fourth-year student clerkship. The second goal is to describe the features of these third-year-specific rotations, specifically regarding content and structure. It is our hope that these data will inform the development of third-year medical student rotations, as well as a future Clerkship Directors in Emergency Medicine (CDEM) curriculum for third-year students.

METHODS

Study Design and Population

We identified medical schools that have 2010–2011 EM rotations that are open to third-year students, using a Society for Academic Emergency Medicine (SAEM)/CDEM database (accessed September 2010) and the “State of the Clerkship” survey, for inclusion in our study.¹⁰ Twenty-six rotations and their respective CDs were identified using these methods, and an additional six rotations were identified by representative CDs at the 2011 Council of Emergency Medicine Residency Directors (CORD-EM) academic assembly, resulting in the inclusion of 32 schools and respective CDs in this study. This survey study was approved by the New York–Presbyterian Hospital–Columbia University Medical Center institutional review board.

Survey Content and Administration

This survey was composed by consensus opinion of CDs and the authors. It was piloted by approximately 20 members of CDEM and discussed by a CDEM focus group. Survey topics included rotation logistics, educational strategies, demographics of students and faculty, evaluation mechanisms, and institutional support. Open-ended questions pertained to perceived successful aspects of rotations, potential clerkship changes, and the effect of EM rotations on the emergency department (ED). Electronic or paper copies of the survey were sent to 32 CDs. In a few cases, surveys were administered over the phone or during the national CDEM meeting in March 2011. Responses were obtained during the 2010–2011 school year.

Data Analysis

Descriptives. Since most of the survey items allowed for nonnumerical responses, all responses to questions asking for nominal data were categorized into sets of discrete responses. Responses to questions asking for interval data were categorized into numbers representing the response. The means and standard deviations for interval scale survey items asking about the numbers of hours, years, or students were calculated. Frequencies were compiled for responses to Likert-scale questions. Frequencies across programs were compiled for questions pertaining to nominal data, such as the type of feedback given to students (i.e., written, verbal, combined).

Open-ended Questions. Survey items about rotation strengths, areas to change, benefits to EDs, and other comments were read for themes and illuminating comments and are discussed in the Results section.

RESULTS

General Rotation Characteristics

Of the 32 CDs contacted, 23 responded to the survey (72%). Figure 1 shows a breakdown of responses by third-year-specific rotations compared to third- and

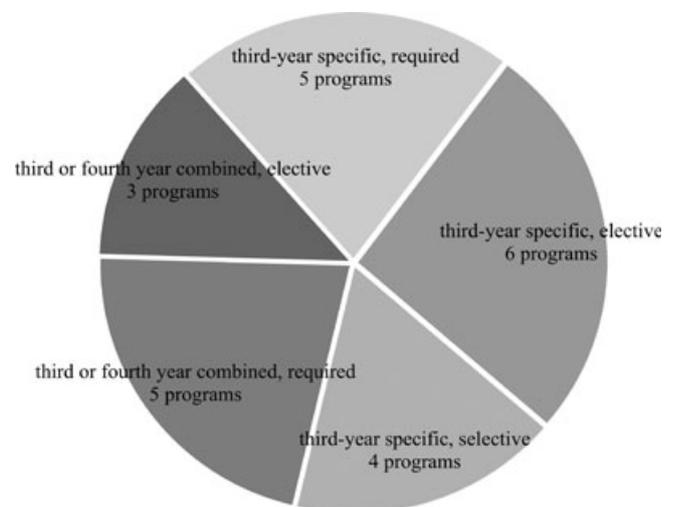


Figure 1. Clerkships offered.

fourth-year rotations and by required, elective, or selective.

The six institutions with EM elective rotations had student participation rates of 1% to 21% per class (average of 10%). The four institutions with an EM selective had wider variability in participation rate, with two schools reporting 14% participation and two schools reporting around 70% participation. Seven institutions included ED shifts as part of other core rotations, most commonly in pediatrics. Third-year rotations have been offered at the respective institutions for an average of 4.6 years (range = 1–10 years).

Specialty Choice

Students chose EM as a specialty more often at the five schools with required EM clerkships for third-year students. Fifteen percent of students across the schools with required EM clerkships applied to EM clerkships, compared to 10% of students attending schools with selective EM clerkships and 11% of schools with elective rotations.

Clerkship Characteristics

Institutions varied in their requirements, resources, and educational strategies. The third-year students at all institutions interacted with resident physicians in the ED setting. Clinical time averaged four 8-hour shifts per week over 4 weeks. Shift length varied from 4 to 12 hours, with 8-hour shifts at 71% of the institutions represented. The duration of rotations varied from 2 weeks to one semester, with the majority being either 2 or 4 weeks. The prerequisite rotations most commonly required to begin third-year EM clerkships were internal medicine and/or surgery, followed by pediatrics, “all other core clerkships,” and then OB/GYN. Additional characteristics are described in Figure 2.

Assessment of Student Learning, Evaluation, and Feedback

Thirteen of the 15 schools (87%) with rotations specifically for third-year students had students present clinical cases to both resident physicians and directly to attending physicians. At 14 of the 15 institutions, resi-

dents assist students in managing cases, assuming that there are residents in the ED simultaneously.

The use of direct observation for evaluating students varied; it is required at five programs, optional at five programs, and not used at four programs. One rotation used the simulation lab to provide a consistent evaluation tool, given the variability of ED case exposure and supervision. For those rotations using a written exam, 50% used questions from the SAEM question bank, and the other 50% created institution-specific exams to highlight points from their curricula.

Clerkship directors or site directors completed the final evaluations for students at all institutions. The evaluation process for third-year students mirrored that for the fourth-year students at 60% of the institutions. Of the remainder, 27% created their own evaluation systems, and 13% did not have a fourth-year rotation for comparison. Eighty percent of the institutions offered no incentive for faculty to complete evaluations other than their own commitment to education. Two institutions used the ED chair to encourage participation. Additional evaluation characteristics are shown in Figure 3.

Director Experience

Of the 15 CDs managing rotations specific to third-year students, 67% are also involved in managing the fourth-year rotation, while 33% solely manage the third-year students. The CDs spend between 2 and 15 hours per week (mean = 4.8 hours) on rotation responsibilities. Sixty-seven percent of rotations are managed by the CD alone; 33% are administered with co-directors, site directors, or additional coordinators.

Institutional Support

Clerkship directors reported consistently low levels of departmental and medical school financial and administrative support for the clerkships (Figures 4 and 5). The directors consistently rated medical schools as providing less support for the clerkships than the EM departments provided. None of the CDs received educational grants from sources outside of their institution; one rotation received funding from its affiliated medical school.

Comments About Third-year Rotations

Clerkship directors mentioned a few benefits to EM from having a third-year student rotation. Twenty

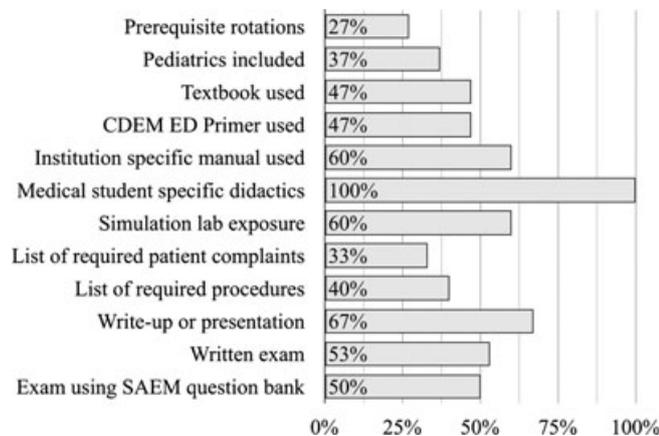


Figure 2. Characteristics of third-year-specific clerkships. CDEM = Clerkship Directors in Emergency Medicine.

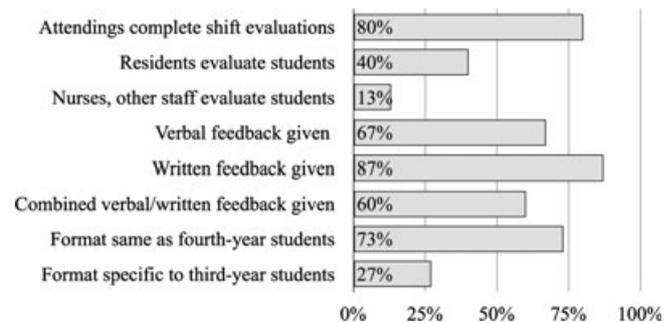


Figure 3. Student evaluation format characteristics.

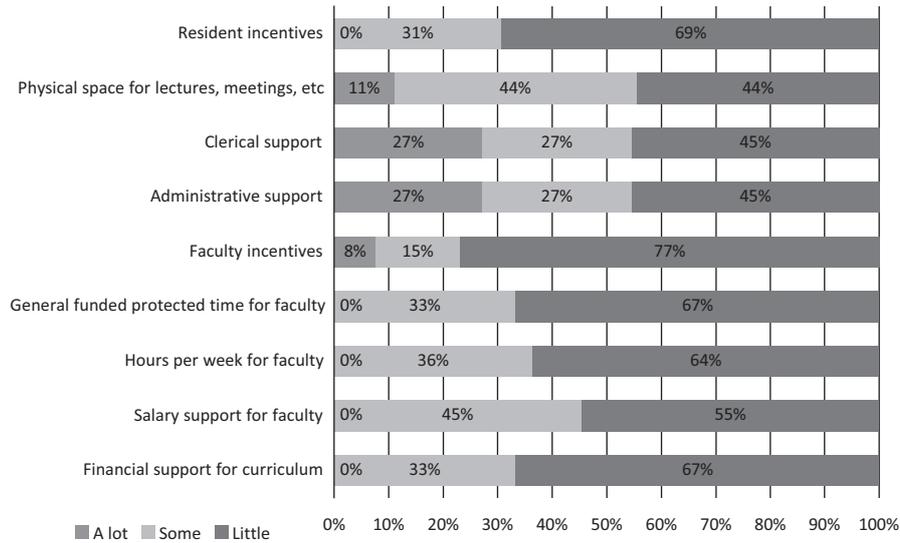


Figure 4. Clerkship director perception of amount of support from the EM department.

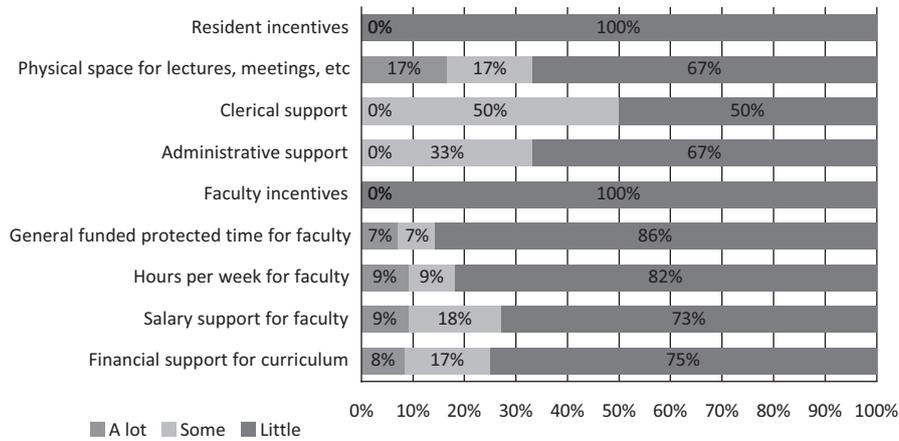


Figure 5. Clerkship director impression of amount of support from medical school.

CDs shared benefits. For example, having a third-year-specific rotation increases student interest in EM, strengthens the departmental status of the ED, and enhances the scholarly environment for faculty, residents, and students. One CD noted, “I think having MSIII students keeps both faculty and residents interested in teaching, and more enthusiastic about the specialty in general when they work with fresh, excited students. It also is a great chance for our residents to begin to hone their teaching skills. The nurses like it too and have a chance to begin to interact with these students professionally at an earlier phase in the student’s career.”

However, four CDs also expressed concern over the amount of supervision required for third-year students. One CD shared that “many times students are very junior and not too experienced, thus aren’t allowed to act as independently as the fourth years are.” There was additional concern for the effect on the department in terms of patient care with time-sensitive emergencies and patient flow.

When asked what about the third-year rotations worked well, CDs reported that extra simulation time and one-on-one pairing of students with residents,

faculty, or nurses were useful educational strategies. One CD highlighted another useful feature: “Our teaching rotation occasionally includes other specialties (mainly dentistry, occasionally pharmacy), which is a good opportunity for interprofessional learning.” Another institution reported using a set curriculum to advise students about procedures, observations, and chief complaints, with an attending physician or resident required to sign off.

In terms of desired changes and recommendations, the CDs most commonly commented on the need for increased financial and administrative support and additional teaching resources to make these rotations sustainable. One CD also mentioned the importance of third-year students having done their medicine or surgery clerkships as a prerequisite to build a foundation of knowledge. There were varied perspectives on whether it best to have a required or elective/selective rotation, based on the interest of students involved.

DISCUSSION

Many, including the authors of this paper, would argue that EM is an integral aspect of medical education.^{5,6}

To the best of our knowledge, this study comprises the first published data on the structure of EM rotations for third-year medical students in the United States.

This survey identified 15 schools offering EM rotations designed specifically for third-year students, evenly divided between required, elective, and selective rotations. There were eight institutions combining third-year and fourth-year students in EM rotations. This reveals the broad spectrum of experiences in EM available to third-year students across the country.

Three-quarters of schools with EM rotations for third-year students did not require other clerkships as prerequisites, allowing students into the ED on their first clinical day. These students represent novice learners who need to be taught the fundamentals of clinical management that students in the latter part of their third year already possess. This type of learner presents a challenge for the ED staff and physicians in teaching while still maintaining ED flow and the same level of patient care. Curricula for these students need to be flexible to adapt to the rapidly evolving competency of third-year students.

The specific rotation characteristics varied widely for the institutions surveyed, with a few exceptions. In general, the rotations include four 8-hour shifts of clinical time per week for the duration of the rotation. Each institution offers didactic time specifically for third-year students, suggesting that lectures are still common, despite the rise of asynchronous learning methods such as videotaped lectures, podcasts, and online educational tools. The growth of the use of the simulation lab is reflected in its use by more than half of schools with third-year EM rotations. The variation in the use of textbooks, an ED primer, or institutionally developed syllabi might suggest the need for improved curricular materials targeting the third-year student, since much of this content has been created for the fourth-year student. The use of lists of required/recommended procedures and patient complaints varied, despite the lack of procedural skills being a general issue for medical student education across the nation.^{13,14} The number of medical procedures performed in EDs every day suggests plenty of opportunity for students to learn how to perform common procedures, provided that adequate supervision exists.

Assessments of student learning varied somewhat by institution. Only some of the schools required a case write-up or presentation, and final written exams and the use of the SAEM question bank also varied considerably. Some CDs made the SAEM question bank available to interested students as a learning tool, while others wanting to use the question bank for summative evaluation purposes felt that the students had easy access to the answers to the question bank, warranting a proctored school-specific exam. It may be noted that EM is the most prevalent rotation in medical schools that does not yet have a National Board of Medical Examiners Clinical Sciences subject examination.¹⁵

Feedback and evaluation processes are important in monitoring both student performance and rotation quality. We found variation in whether CDs gave students final evaluations verbally, in written form, or both. Verbal feedback is more useful in student

self-assessment¹⁶ and in fostering discussions that lead to further learning.¹⁷ While most schools use the same evaluation tool for both third-year and fourth-year students, some institutions cited a unique evaluation process for the third-year students. This may reflect the difference in learning objectives of each year or may be a result of having different CDs at most institutions for the third- and fourth-year rotations. The use of direct observation and the simulation lab as evaluation tools varied considerably, although this may increase as these methods become more popular. All the schools surveyed believed in the importance of student evaluations of the rotation.

The survey results demonstrate the viability of offering EM as a selective or elective if an institution is unable to or does not want to accommodate the entire class into a required clerkship. Several institutions offer a boutique third-year experience for medical students in EM. One institution cited an elective third-year student rotation involving one to two third-year students per year, with several prerequisites, catering to interested medical students. A different institution offers a longitudinal experience over one semester, with a curriculum similar to that of a 4-week rotation. Several CDs commented in the survey that minimizing the number of students involved makes the rotation a viable endeavor from the departmental perspective, especially with a lack of funding and administrative support from the medical school. Other opportunities for an EM rotation include subspecialty topics such as toxicology, emergency ultrasound, wilderness medicine, prehospital care, and research; several schools are already taking advantage of these opportunities. Some schools incorporate ED shifts into other rotations, although this experience may lack the knowledge, skills, and attitudes taught within a dedicated EM clerkship.

A notable finding of the survey is that the institutions that required third-year students to rotate through a third-year EM clerkship had higher application rates to EM residencies, compared to elective and selective rotations. This finding supports the idea that exposure to a specialty in the third-year of school may be an important determinant of eventual specialty choice. This is contrary, however, to the previously published study by Zun and Downey,¹⁸ which concluded that there is no correlation between the presence of a required third-year EM rotation and the application and match rate into EM residencies. The data here show that exposure to EM in their third year might allow more students to decide if EM is the right specialty for them, prior to the start of the residency application process in their fourth year, although the true effect is yet to be determined.

All students, regardless of specialty choice, need education in the basics of EM.¹² However, the majority of clerkships surveyed here are supported more by EM departments than by the medical schools. As emphasized in the commentary by CDs, EM educators should be eliciting and receiving more financial and administrative support for these rotations, comparable to that given by the medical school to other clerkships considered essential for medical education.

LIMITATIONS

Not all third-year EM rotations are represented in the data presented, but the data presented are consistent with the known extant rotations involving third-year students as of 2007. Rotations were identified from the 2007 CDEM database as well as the CORD 2011 academic assembly, but these methods may not have captured all rotations. In the future, analyses of EM rotations will be facilitated by the Association of American Medical Colleges' online Curriculum Inventory Portal service,¹⁵ which will replace the CurMitt Curriculum Directory,¹⁹ allowing for direct comparison of medical school curricula. This article is descriptive and relies on self-reported data in surveys, which may be affected by recall bias and inaccurate subjective estimations by the reporter.

There were several topics surveyed that warrant further investigation. The reasons for differences in modes of faculty evaluation of students, for example, may reveal a need to assess the quality of evaluation via different modes, to find the most effective methods. The amount of support provided to the rotation by the medical schools and EM departments needs to be more clearly defined based on salary, incentives, reduced clinical hours and workload, administrative time, and other modalities for compensation. The application and match rates for EM residencies need to be reevaluated in light of studies with differing outcomes on whether a third-year rotation does affect specialty choice or if it is rather a marker of the perceived importance of EM that pervades the institution as a whole. Additional studies directly comparing third-year and fourth-year rotations are needed, as this was not included in this survey. The number of schools allowing students to work in the ED as part of other clerkships is likely underestimated given that schools without EM clerkships did not fill out this survey.

We hope that the data on content and structure provided through this survey will raise awareness among EM educators and medical schools regarding the current content and structure of third-year medical student clerkships in EM. These data will provide insight for a CDEM work group that is developing a national standard for an EM curriculum designed specifically for third-year students.²⁰ We are not able to make specific recommendations as to the best practice for these rotations using these data, yet additional research opportunities exist in the form of case studies of CDs who have successfully implemented sustainable EM rotations, as well as in analysis of the actual effect of students on EM departments in terms of patient flow, revenue, patient satisfaction, faculty job satisfaction, and academic productivity.

CONCLUSIONS

This survey offers a current view of the state of EM education for third-year medical students, illuminating common characteristics across institutions. These data can inform the development and growth of EM clerkships for third-year students, to increase both quality and consistency of education for students.

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