Medical Student Perception of Resident Versus Attending Contributions to Education on Co-Supervised Shifts During the Emergency Medicine Clerkship

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ABSTRACT

Objective: The objective was to assess medical student perception of resident and attending contributions to nine Accreditation Council for Graduate Medical Education educational objectives during their emergency medicine (EM) clerkship.

Methods: This was a prospective survey study of fourth-year medical students during their EM clerkship in a single academic emergency department. Students anonymously completed end-of-shift surveys if supervised by both resident and attending physicians. Students estimated the relative educational contribution from resident and attending on a 100-point visual analog scale (−50 to 50) with −50 = 100% resident contribution, +50 = 100% attending contribution, and 0 = equal contributions by resident and attendings. Nine educational objectives were surveyed: evidence-based medicine (EBM), clinical knowledge, chart documentation, bedside teaching, patient throughput, interpersonal communication, oral patient presentations, efficiency, and procedural instruction.

Results: We collected 274 surveys from 65 students. Of the nine objectives, students perceived that residents contributed more than attendings in eight of nine (results reported as mean values with 95% confidence intervals): clinical knowledge −4.5 (−7.3 to −1.7), chart documentation −8.0 (−12.0 to −4.0), bedside teaching −8.6 (−12.0 to −5.2), throughput −13.0 (−16.4 to −9.6), oral presentations −14.2 (−17.3 to −11), efficiency −14.4 (−17.6 to −11.3), procedural instruction −20.2 (−24.0 to −16.5), and interpersonal communication −13.5 (−17.7 to −9.4). The sole outlier favoring attendings was EBM: 5.5 (1.9 to 9.1).

Conclusions: Medical students perceive resident physicians to contribute more than attendings for most of their EM educational objectives, with faculty providing the greatest contribution to their EBM training.

Education of medical students in clinical clerkships is highly variable. At some institutions, students work directly with attendings for the bulk of their time, while at others, house staff serve as the primary educators. In one study, 67% of students noted that residents played a significant role as teachers and attributed up to one-third of their clinical knowledge to housestaff.¹ Studies of medical students completing

their surgical clerkships have documented how students view residents as their primary source of education in patient care and how improved scores of residents as educators paralleled medical student interest in a surgical career.^{2,3}

There is, however, a relative dearth of quantitative research analyzing the relative contributions of faculty and residents to medical student education in the

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emergency department (ED). To this end, we examined medical students' perceptions of resident and attending contributions to nine Accreditation Council for Graduate Medical Education (ACGME) educational objectives during their emergency medicine (EM) clerkship.

METHODS

Study Setting and Population

This prospective survey study was conducted during 2011 to 2012 at Cooper University Hospital, an academic, urban, tertiary care center located in Camden, New Jersey, with a yearly census of 64,000 visits at the time of the study. The Cooper ED served as a clinical site for the required fourth-year EM clerkship rotation for Robert Wood Johnson medical students on the Camden campus. There were 21 board-certified attending physicians and 11 senior (PGY-3) residents during the investigation.

Medical students were approached for participation at the beginning of each of the 10 EM clerkship blocks throughout the 2011 to 2012 academic year. Participation was voluntary. The study was approved by the Cooper Hospital institutional review board with exempt status and students were provided written informed consent.

Study Protocol, Measurements, and Data Analysis

Students completed anonymous surveys after clinical shifts where all cases were supervised by both a senior resident and an attending physician. Students first presented to the resident, and then to the attending physician, who would further refine their management plan and provide additional feedback and education. After this initial structured format, further interactions between the medical student, resident, and attending were ad lib: students had full access to both resident and attending physicians and vice versa. There were no structured requirements on the type of content reviewed or the methods of instruction, nor was there an explicit division of teaching responsibilities between resident and attending.

After each shift, students completed an anonymous survey to estimate the teaching contributions from the resident and attending for nine educational objectives selected from the 2011 ACGME Common Program Requirements.⁴ These competencies were the basis for the clerkship objectives, as noted in the medical

student syllabus. The nine competencies consisted of evidence-based medicine (EBM), clinical knowledge, chart documentation, bedside teaching, patient throughput, interpersonal communication, oral presentations, efficiency, and procedural instruction. Students scored each item on a 100-mm visual analog scale (VAS), which ranged from -50 to +50, with -50 representing "100% resident contribution," +50 representing "100% attending contribution," and 0 representing "equal attending/resident contributions." Mean scores with 95% confidence intervals were calculated for the nine ACGME-based educational goals.

RESULTS

During the study period, there were 385 shifts where students worked with both residents and attendings. All 65 students rotating in the fourth-year EM clerkship agreed to participate in the study. We received surveys from 61 students (94%) and 274 surveys were collected for a response rate of 71%.

There were 36 (55%) female students and ages ranged from 23 to 36 years. Forty-six students were from Robert Wood Johnson Medical School and 19 were visiting students. Twenty-eight students planned to match in EM and 19 had completed at least one EM rotation prior to the study period.

Of the nine educational objectives studied, students perceived that most of their teaching was from residents, except for EBM (Table 1). Ninety-four percent of students did report working with *both* resident and attending physicians as "important" to their educational experience and 59% of all students scored this item at 90 points or higher on a 100 point VAS scale.

Table 1
Medical Student Perception of Resident and Attending Contributions to Education

Educational Objective	Mean 95% CI
Evidence-based medicine	5.5 (1.9 to 9.1)
Clinical knowledge	-4.5 (-7.3 to -1.7)
Chart documentation	-8.0 (-12.0 to -4.0)
Bedside teaching	-8.6 (-12.0 to -5.2)
Throughput	-13.0 (-16.4 to -9.6)
Interpersonal communication	-13.5 (-17.7 to -9.4)
Oral presentations	-14.2 (-17.3 to -11.0)
Efficiency	-14.4 (-17.6 to -11.3)
Procedural instruction	-20.2 (-24.0 to -16.5)

DISCUSSION

To our knowledge, this is the first study to evaluate the perceived proportion of education provided by residents versus faculty to medical students in the ED. While it is widely accepted that role-modeling and near-peer teaching are critical components to the instruction of medical students based on qualitative research and survey studies,^{5,6} quantitative data demonstrating the effectiveness of residents as educators are lacking.

In the academic setting, students have perceived that faculty and residents provide comparable education with regard to simulation and lectures.^{7,8} One explanation for our findings in the clinical setting is that students may find it difficult to approach faculty for feedback and questions, whereas residents, who are generally nearer to the students' age, may be more approachable. In one study by Milan et al.,⁹ 20% of students on an internal medicine clerkship reported "never" asking for feedback from faculty versus 10% for residents, while 33% of students asked for feedback more than three times from faculty and 56% for residents.

These results provide evidence for the importance of near-peer education, as has been demonstrated in previous work. For example, medical students find it helpful to have resident educators teach them parts of the physical examination such as the musculoskeletal examination¹⁰ or procedures on the hospital floors.¹¹ This helps explain why students in our study found that residents provide more education on procedural instruction and other educational objectives. This might also explain why attendings scored higher on EBM teaching. We suspect that residents were more comfortable teaching the "basics." After presenting to residents, medical students likely presented more polished cases to the attendings, which left the attendings more time to explore the literature—reflected by their higher EBM teaching scores.

Although resident physicians provide an important role in the instruction and supervision of medical students during the EM clerkship, it is unclear how prepared they are for this role. Attending physicians at academic institutions have generally demonstrated effectiveness in education and have been vetted by their peers before being granted an academic title and privileges at a teaching hospital. Most have attended specific faculty development sessions geared toward increasing teaching effectiveness.

House staff, on the other hand, may have minimal training and little experience in the education of

undergraduates. Resident-as-teacher (RAT) programs are popular methods to provide instruction on teaching; however, such curricula are not standardized or validated. A 2017 nationwide survey demonstrates that only 60% of EM residencies have such a curriculum, with 84% of respondents desiring a standardized, national RAT program.¹² It has been demonstrated in several studies that students noted improvement in resident teaching after a focused RAT program.^{13–16}

LIMITATIONS

This was a single-site study, conducted over one academic year with a limited attending, resident, and medical student population. Given our teaching structure of medical student presentation to resident first, then attending, our results may not be generalizable to sites that function differently. It is further unclear if our results would be applicable to other specialties or just to students during the EM clerkship.

While the structure of our clerkship did not introduce any explicit source of bias to the study, such as tasking attendings with EBM instruction and residents with procedural instruction, it is possible that students implicitly assumed a division of labor that directed them to approach the senior residents for most of their education. While an important limitation, we nevertheless consider the results to be important in demonstrating the value of residents as educators, regardless of the unconscious biases driving students to approach residents or attendings.

The students participating in the study were a heterogeneous group including EM bound, non EM bound, and outside rotators. It is possible that this affected the relative level of engagement with certain students; for example, senior residents may have placed more effort into the education of students planning to match in EM. Given the small sample sizes of EM-bound ($n = 28$) and outside rotators ($n = 19$), comparisons between these groups would have been underpowered.

Finally, the exact wording of our survey asked the student to estimate the "proportion" of teaching contributed by residents versus attendings. Students may have interpreted this in different ways, i.e., amount of time spent with the student or the perceived *quality* of teaching on each topic. Further, the mean scores for objectives, while statistically favoring residents for most objectives, give no insight into the "clinical significance" of our results. We cannot be sure, for example,

how meaningful a mean score of -13.0 is for throughput. While we acknowledge this limitation, the fact that students judged the resident contributions to be greater than the attendings is a substantial finding emphasizing the importance of residents as educators.

CONCLUSION

Medical students perceive resident physicians to be responsible for much of their education in the emergency medicine clerkship. To our knowledge, this is the first prospective, quantitative study to compare attending and resident contributions to medical student education. Our results reinforce the need for proper training of residents and supports expansion of resident-as-teacher curricula in graduate medical education.

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