

View of precepting medical students by emergency medicine residents

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Objective: This study evaluates the perceived impact of precepting medical students on residents' clinical work.

Method: This is a prospective study of Emergency Medicine (EM) residents in their second and third year of training (PGY2 and PGY3, respectively) over 6 months. While in the ED, students are assigned to residents during shifts. Residents turned in monthly surveys evaluating the impact precepting had on their clinical work. The questions were designed by drawing on previously validated educational surveys given to medical students and residents in inpatient settings. Responses were scored on a 10 cm visual analogue scale (VAS).

Result: Initially, PGY2s and PGY3s had similar attitudes and enthusiasm toward precepting. At the end of the study period, survey items showed differences between the 2 classes as PGY2 VAS scores fell and PGY3 VAS scores remained stable or increased. There were differences in PGY3 vs. PGY2 scores on the statement "Teaching medical students is an important role of the resident physician" (8.01 ± 0.93 vs. 5.24 ± 2.22 , $p=0.029$), "If busy, I still find time to teach" (6.6 ± 0.81 vs. 4.5 ± 1.77 , $p=0.023$), "Students do not interfere with my ability to effectively see patients" (5.67 ± 1.55 vs. 2.8 ± 1.63 , $p=0.015$), "There is adequate time for teaching during a shift" (6.1 ± 1.62 vs. 2.63 ± 1.53 , $p=0.006$), and "I feel well qualified to teach" (6.87 ± 0.92 vs. 4.44 ± 1.87 , $p=0.033$).

Conclusion: In the first 6 months of the PGY2 year, residents find precepting interferes with their ability to perform clinical work. They are less likely than PGY3s to think teaching students is an important role. PGY3s feel better able to precept medical students while working.

Keyword

Medical Students, Residents, Postgraduate Students, Precepting

How to cite this article?

Jeanmonod, R., Barcomb, T., & Pattee, J. (2012). View of precepting medical students by emergency medicine residents. *Education In Medicine Journal*, 4(1). DOI:10.5959/eimj.v4i1.12

Introduction

There are over 180 residencies in Emergency Medicine (EM) in the United States. One third of allopathic medical schools require an EM clerkship (1), and there are more than 135 regular EM rotations offered in the country. Because of the large volume of students in the Emergency Department (ED), residents are often given supervisory roles over medical students. In many instances, the medical student's primary clinical educator is the resident physician. In the United States, the ACGME requires all residency programs to provide evidence of "structured learning activities that demonstrates how the program supports the development of teaching skills" (2).

In recognition of their key role of medical education, some residencies have introduced curricula to teach residents how to teach. Many randomized and non-randomized controlled trials have demonstrated that such a curriculum improves quality of teaching in medicine, pediatric, surgical, psychiatric, and obstetric residencies (3-12), although studies in EM are lacking.

However, residents are not just educators, but are also active learners seeking training in their specific disciplines as well as clinicians caring for patients. It is prudent to evaluate how the role of teacher impacts other aspects of residency training. There is some literature exploring residents' attitudes, perceptions, and interests in terms of their roles as clinical educators, but none of these studies addresses EM residents. EM compared to other medical student clinical rotations has high acuity and less overall structure to the

work-day (for example, no morning and evening rounds and no daily lunch-time conference), which might alter the expectations of the students and residents regarding their educational goals or make the role of educator more challenging. It has been observed that medical student interest in emergency medicine is impacted by observational experiences in the emergency department (13). The quality of teaching by the residents has an impact on that experience and improvement in the teaching received by the students may increase their interest in the field. Conversely, the responsibility of precepting students may impact the residents' perceptions of their ability to efficiently perform clinical tasks and their attitudes towards their roles as teachers.

It has been postulated that the principles of modern medical student curricula should enhance health service provision in a Symbiotic relationship (14) further attesting to the importance of education occurring together with improved quality of patient care. It has been shown that the teaching of medical students by private practitioners both increases their time at work and shifts a significant amount of their patient-centered time to student-centered time (15, 16). While the office setting and the emergency department are clearly different, this decrease or even the perception of decrease in clinical productivity has not been studied among Emergency department residents. It is also not known if Emergency medicine residents feel qualified to teach or if they value their role as clinical educators.

In this study, we sought to assess the impact precepting medical students has on

Emergency medicine resident education and clinical work as perceived by second (PGY2) and third year residents (PGY3). We hypothesized that precepting students would have a perceived larger negative impact on PGY2s compared to PGY3s, as PGY3s have more experience with teaching and prioritizing tasks and are better able to handle the additional responsibility of teaching a student. We also hypothesized that the perceived impact of precepting students on PGY2s would diminish over the study period as they became more comfortable in their roles as teachers and physicians.

Method

This is a prospective cohort study of ten PGY2 and ten PGY3 EM residents during 6 months beginning July 1st, 2008. The study was performed at a tertiary care ED with an annual census of 72,000. The residency program hosts 10 residents in each class. The hospital is affiliated with a medical school, and EM is a mandatory rotation for all 4th year students, amounting to 10 students assigned to the ED per month. While in the ED, all students are assigned to PGY2 and PGY3 residents for day and evening shifts. Those residents act as the primary educator for the students during the course of their shifts, taking verbal presentations from the students and providing teaching and feedback.

Each month during the study period, a research associate presented the study and its goals to EM residents during their mandatory conference time, and then distributed surveys for that month. All surveys were returned at the end of conference (100% response rate). EM residents who were involved in precepting

students (all PGY2 and PGY3 residents assigned to the ED in a given month, typically 7 to 10 residents per class each month) turned in monthly surveys evaluating their perceptions of their role in teaching medical students and the impact of that teaching on their ability to complete their necessary clinical work during a shift. EM residents on off-service rotations and non-EM residents were excluded. Post-graduate year one residents were excluded, as they do not precept students at our institution.

The survey contained 20 items (Table 1). Survey questions were written by a group of emergency physicians consisting of two resident physicians and one attending physician after researching what the literature has described as effective teaching attributes. Specifically, these were based on items identified to be integral to success as a clinical educator in other studies (17-22) and included questions pertinent to the domains of "medical knowledge," "feedback," "adaptability," "accessibility," "professionalism," and "enthusiasm."

There were also items designed to assess residents' "confidence" and "attitude" toward their roles as clinical educators, and several "global" questions. The group of physicians collectively wrote all survey items.

Table 1: Survey Items

Domains	Item #	Survey Questions
Medical knowledge	Q1	I involve students in procedures as a method of teaching.
	Q2	Teaching students helps me solidify my own knowledge on a subject.
Feedback	Q3	I listen to presentations from students and provide meaningful feedback.
Adaptability	Q4	I change my teaching style to adapt to students' needs.
	Q5	I'm good at assessing students' baseline level of knowledge.
Accessibility	Q6	There is adequate time for teaching during a shift.
	Q7	Students do not interfere with my ability to effectively see patients in the ED.
	Q8	If busy, I still find time for teaching.
Professionalism	Q9	Teaching medical students is an important role of the resident physician.
	Q10	Teaching medical students helps to make me a better physician.
Enthusiasm	Q11	I enjoy teaching students and have an overall positive attitude toward teaching.
	Q12	I have a high level of enthusiasm when teaching.
Confidence	Q13	Teaching comes easily to me.
	Q14	I feel well qualified to teach.
	Q15	I consider myself a good role model for students with an interest in EM.
Attitude	Q16	In general, my students seem genuinely interested in learning.
	Q17	Students appreciate my teaching.
Global	Q18	I have a background or formal training in teaching techniques.
	Q19	I feel a formal "How to Teach" course would make me a better teacher.
	Q20	I have an interest in continuing to teach after residency.

Responses were scored on a 10 cm visual analog scale (VAS), with 0 corresponding to “Strongly disagree” and 10 corresponding to “Strongly agree.” This scale was used on the advice of a statistician because the items were felt to be continuous variables and because using a VAS would lend power to the repeated analysis of a small number of providers (total n=20, 10 per class). Each resident involved in the study was assigned a subject number which was used to codify the surveys. The research associate collecting the data and the associate analyzing the data were blinded to subject identities. No identifying information was collected beyond level of training.

Changes in answers over the study period for all residents were analyzed using Friedman’s test. PGY2 and PGY3 data were compared on a month-by-month basis using non-parametric tests (i.e. Mann-Whitney) to assess for differences between the 2 groups, as the data were not normally distributed. Descriptive statistics were used to globally assess responses to survey items. The study protocol was reviewed and approved by the Institutional Review Board.

Result

Within the domain of “medical knowledge,” the combined data for both PGY2s and PGY3s throughout the study period showed a median VAS of 7.5cm, “feedback” showed a median VAS of 6.8cm, “adaptability” showed a median VAS of 6.7cm, “accessibility” showed a median VAS of 4.8cm, “professionalism” showed a median VAS of 6.6cm, “enthusiasm” showed a median VAS of 6.6cm, “confidence” showed a median VAS of

6.4 cm, and “attitude” showed a median VAS of 6.2cm (Table 1).

There was no significant change in responses over the course of the study period when data from both PGY2s and PGY3s were combined.

In comparing PGY2 and PGY3 responses to survey items at the start of the study, there were no major differences between VAS scores. In the first month of the study, PGY2s and PGY3s had similar overall attitudes toward precepting students. At the end of the 6 month study period, however, several survey items showed differences between the 2 classes as PGY2 VAS scores fell and PGY3 VAS scores remained stable or increased (Table 2). Specifically, there were differences in PGY3 vs. PGY2 scores on all of the items in the domain of “accessibility,” including “If busy, I still find time to teach” (6.6 ± 0.81 vs. 4.5 ± 1.77 , $p = 0.023$), “Students do not interfere with my ability to effectively see patients” (5.67 ± 1.55 vs. 2.8 ± 1.63 , $p = 0.015$), and “There is adequate time for teaching during a shift” (6.1 ± 1.62 vs. 2.63 ± 1.53 , $p = 0.006$). There were also differences on the statement “Teaching medical students is an important role of the resident physician” (8.01 ± 0.93 vs. 5.24 ± 2.22 , $p = 0.029$) and “I feel well qualified to teach” (6.87 ± 0.92 vs. 4.44 ± 1.87 , $p = 0.033$), with PGY3s rating higher VAS scores than PGY2s on both questions.

Table 2: Comparison of PGY2 and PGY3 Survey Items in July and December

Domains	Item #	July			December		
		PGY2 median cm	PGY3 median cm	p value	PGY2 median cm	PGY3 median cm	p value
Medical knowledge	Q1	7.6	8.3	0.42	7.2	8	0.45
	Q2	7.4	7.7	0.93	6.3	8.5	0.08
Feedback	Q3	5.4	7	0.09	6.5	6.9	0.16
Adaptability	Q4	5.4	5.8	0.83	5.4	7.4	0.13
	Q5	5.4	6.3	0.33	5.9	7.2	0.05**
Accessibility	Q6	3.9	4.6	0.69	2.3	5.8	0.006**
	Q7	4.9	4.2	0.76	2.6	5.3	0.01**
	Q8	5	6.8	0.31	4.4	6.7	0.02**
Professionalism	Q9	6.1	7.6	0.4	5	8.0	0.03**
	Q10	6.4	8.1	0.27	5.6	8.5	0.06
Enthusiasm	Q11	7	7.2	0.5	5.6	7.3	0.06
	Q12	6.3	6.2	0.54	5	7	0.07
Confidence	Q13	5.2	6.6	0.18	4.8	6.5	0.14
	Q14	5	6.5	0.2	5	6.7	0.03**
	Q15	6.1	6.4	0.6	7	7.2	0.5
Attitude	Q16	5.8	6.5	0.48	5.7	6.9	0.06
	Q17	5	6.3	0.45	5.8	6.8	0.1
Global	Q18	2.9	4.7	0.37	2.6	4.6	0.31
	Q19	5.1	5.3	0.93	4.6	5.4	0.48
	Q20	5	6.2	0.69	4.7	7.7	0.12

Medians are reported. P values calculated utilizing Mann-Whitney. $P < 0.05$ denotes statistical significance (**).

Discussion

In our study, PGY2 residents were moderately enthusiastic about the prospect of precepting medical students at the start of the study period and did not think the students would interfere with clinical work and clinical education. As none of the PGY2 residents had any prior experience with precepting students

in the ED before the start of the study, their responses to the survey questions may be viewed as a true baseline, reflecting their expectations but not their experience. PGY3 residents, on the other hand, had already spent a full year precepting medical students on many of their shifts, and their responses, while similar to those of PGY2s, were representative of their prior year's teaching

experience. PGY3 responses changed very little over time, supporting that they had reached a fairly stable state over their previous year of teaching in terms of their attitudes and comfort with preceptorship.

Over the course of time, PGY2s had a modest decrease in their attitudes towards precepting students, such that at the conclusion of the study, many of their VAS scores were significantly lower than that of their PGY3 colleagues. This may be because PGY2s have heightened responsibility for departmental through-put and efficiency compared to their PGY1 year, and are not ready for the additional responsibility of precepting medical students, as they are highly focused on their new clinical challenges. They may simply have reached a saturation point at which they are learning so many new tasks themselves that they cannot teach another person at their level of training. PGY3s could conceivably have already adjusted to being the “workhorses” of the ED over the course of the prior year, and may be better prepared to take on additional tasks, such as teaching. PGY3s also might simply have more practice and have become accustomed to teaching students, or may be better able to utilize students to help, rather than hinder them with their clinical work.

There might have been an impact on the attitude of the PGY2s by the students themselves. Students who are interested in EM as a career choice often do their EM rotation very early in the academic year, and the higher VAS scores in the early months of the year might be reflective of the increased enthusiasm of the students for the residents’ teaching. Enthusiasm can be infectious, and it

could be that students mandated to take EM as a clerkship but with no interest in the field might draw residents’ VAS scores downward. Differences between PGY2s and PGY3s might also be explained by differences in fund of knowledge.

More experienced residents might truly have more to teach because of increased experience and knowledge. The difference might also be explained by a difference in confidence, where more experienced residents are more comfortable in the clinical setting in all its permutations as compared to less experienced residents, and are better able to navigate themselves and their patients in their ED. PGY2s might well have adequate teaching skills, but simply lack confidence in their abilities.

The domain that seemed to show the biggest differences between PGY2s and PGY3s was that of “accessibility.” This domain specifically pertains to finding the time to teach and balancing clinical work, clinical education, and precepting. Although studies in the ED have shown that teacher productivity (in terms of relative value units per hour) and departmental workload have no impact on the success of ED attending as clinical educators (23, 24), there are no studies looking at clinical workload and its impact on residents as educators.

Although we did not quantify residents’ workload or students’ perceptions of them as teachers, it was clear that PGY2s felt somewhat discouraged at trying to teach while working clinically within the time constraints of a busy ED. Future studies might address whether these perceived issues with multi-tasking are improved with a course providing residents with tools to assist them as teachers.

Limitation

Our study would be more informative if we had simultaneously tracked the teaching evaluations from students for the residents over the 6 month time period. This would have allowed us to know if residents' attitudes about themselves and their abilities were resulting in inferior evaluations of them by the students (for example, did the residents really did perform more poorly as teachers during busy shifts?) or if their scores were simply a matter of disillusionment, and not performance. While teaching evaluations do not necessarily reflect teaching abilities due to the multitude of variables that may affect one's perception of their educator, they might have still provided some insight into the resident's self reflection on their ability to teach.

Our study also suffers from small numbers, as there are only 10 EM residents per year in our residency, and they are not all assigned to the ED every month. All available residents participated in the study, but because there are so few, there might be differences between the classes that were not detected. Our study was also performed at a single institution, and the results may not be generalizable to other institutions. Because our institution is associated with a medical school with EM as a mandatory rotation, there are many students requiring preceptorship and teaching. Survey results might be different at less busy institutions or those with fewer total rotating students, as that would lead to a smaller educational burden on the residents.

Conclusion

Residents play a critical role in both the clinical functioning of the ED and the educational mission of training medical students. Prior to having any experience with teaching, PGY2s were enthusiastic about the

prospect of teaching students and balancing their clinical work with preceptorship. After 6 months, PGY2s had doubts about their ability to meet their own service requirements while teaching students, and had decreased enthusiasm for teaching.

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Accepted: April 2012

Published: June 2012