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Volume 7(2)

March/April 1998

pp 149-154

How Students Learn From Community-Based Preceptors [Original Contribution]

Epstein, Ronald M. MD; Cole, David R. EdD; Gawinski, Barbara A. PhD; Piotrowski-Lee, Suzanne MD; Ruddy, Nancy B. PhD

From the Highland Hospital Primary Care Institute (Dr Epstein) and the Departments of Family Medicine (Drs Epstein, Cole, Gawinski, Piotrowski-Lee, and Ruddy) and Psychiatry (Drs Epstein, Gawinski, and Ruddy), University of Rochester School of Medicine and Dentistry, Rochester, NY; and the Institut d'Estudis de la Salut, Barcelona, Spain (Dr Epstein).

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Abstract[^]

Objective: To explore how students learn in community-based family physicians' offices from the student's point of view.

Method: Each student completing a community-based family medicine clerkship wrote a "critical incident" narrative about an event that was particularly educational. A coding system was developed by a multidisciplinary research team and thematic analysis was conducted.

Results: Critical education experiences were brief, problem-focused, had definitive outcomes, were often collaborative, and led to self-reflection. The most commonly identified mode of learning was "active observation." In most of these situations, the student had significant clinical responsibility, but some involved observation of complex tasks beyond the expectations of a medical student. Most (77%) identified their learning needs after having observed a preceptor, rather than prospectively. Collaboration, coaching, advocacy, and exploring affect were means whereby preceptors and students created a learning environment that students felt was safe, allowed them to recognize their own learning needs, and helped them adopt new behaviors.

Conclusions: These findings broaden the definition of active learning to include active observation and support learner-centered and relational models of learning. Increasing preceptors' awareness of these modes of student learning will enhance the quality of education in ambulatory settings.

Arch Fam Med. 1998;7:149-154

IN MANY regions of the United States, the majority of community-based family physicians are involved in practice-based education of medical students and residents. Accordingly, faculty and students have had to adopt new ways of teaching and learning that take into account the realities of primary care practice. [1-3] Compared with what students face in hospital-based learning environments, students in an outpatient setting encounter problems such as time constraints that preclude lengthy patient interviews and examinations, complex psychosocial issues, the need to synthesize the patient data quickly and succinctly before medical decisions must be made, and the need to write brief rather than exhaustive medical record notes. Studies of effective teaching and learning in ambulatory primary care settings, [1,4] including rural family practice preceptorships, [5-7] show that learning is related to the quality of case mix, number and quality of teacher-learner interactions, opportunity for hands-on clinical experiences, and continuity with patients and preceptors.

Many community-based physician faculty recruited to support newly created family medicine clerkships have had limited training in teaching in the ambulatory setting. Teaching roles are superimposed on complex demands of patient care in busy practices. Students enter into long-standing relationships between preceptors and their patients. The preceptor must attend to the physician-patient relationship and, at the same time, assess the student's abilities and tailor the clinical experience accordingly. These factors introduce variability in the opportunities for hands-on experience and the number and quality of teacher-learner interactions. Despite these challenges, students report that community-based practices offer closer supervision, greater diversity of patient problems,

and more meaningful teacher-student interactions when compared with residency-based clinics. [\[8,9\]](#)

Students learn by caring for patients in realistic settings with graded increases in clinical responsibility and by actively participating in care rather than shadowing or observing. Typically, students are encouraged to see the patient alone and make an independent assessment. Students then present their observations and formulations to the preceptor, who presumably engages the student in discussion, sees the patient with the student, and coaches the student in the management and planning phases of the visit. There may be further discussion of the patient immediately after the visit, later in the day, or during a periodic feedback session. Many educators assume that this is the ideal model for learning in the ambulatory setting.

However, informal conversations with students participating in our new family practice clerkship suggested that learning situations are more diverse than those described in the model above. Students also seemed to value tremendously the opportunity to observe and collaborate with their preceptors. Students and preceptors together develop a variety of innovative ways to learn.

To our knowledge, there has been little inquiry into students' perspectives on learning [\[5,6\]](#) in ambulatory settings, and none in the United States. Exploring the learner's perspective in medical education is important because adult learners tend to learn from problems that are important to them, rather than from teacher-defined problems. [\[10,11\]](#) Reflection on what has been learned is also critical in helping students generalize from their experiences and adopt new behaviors. [\[12\]](#)

Questions that have emerged from previous studies include how students organize the observations they make about their preceptors' practices, what types of learning experiences students seek out, whether students imitate preceptors with or without personal reflection, how students synthesize clinical methods learned in ambulatory settings (eg, the focused history) with those learned on other rotations (the "complete H & P" [history and physical examination]), and which experiences have the greatest educational effect on students. We know little about what students do when they encounter a situation in which they feel they need help. We do not know whether students and preceptors identify learning needs and goals prospectively (before the clinical encounter) or retrospectively (during or after the clinical encounter), nor how students learn new behaviors and generalize what they learn to other patients and settings. Also, we do not know how or to what extent students challenge assumptions and reflect on what they have learned.

We conducted this study to document students' self-identified important learning events during a selective fourth-year family medicine clerkship, and to organize these modes of learning in a way that will be useful for family physicians taking on the responsibility for educating students in their offices.

PARTICIPANTS AND METHODS[^]

In the 1994-1995 academic year, the family medicine clerkship was a "selective" fourth-year experience (alternate choices were geriatrics and rehabilitation medicine) that was taken by half the class, of whom 37 students (39%) did the clerkship in the Rochester, NY, area. At the end of the clerkship, all students were asked to write a narrative in which they would identify a situation that was particularly educational, describe what happened, and report specifically on what had contributed to their learning. These "critical incident" reports were collected on the final day of the clerkship. Students were informed that the critical incident reports would have no bearing on their grade for the course as they would not be read until after grades had been submitted.

Critical incident reports were originally developed by Flanagan [13] and have been used as a research tool in a variety of educational, [14,15] organizational, and clinical care settings [16] to discover important patterns in situations that had presented problems but had not previously been well described. Brookfield [17] defines a critical incident as "brief descriptions by learners of significant events," elicited via focused questions that guide the participants through a factual description of as well as reflection on the events. The result is a vivid exemplar that portrays the heart and soul of the event from the writer's perspective, including the "setting, details of what occurred, an account of the outcomes, and reasons the teaching was considered effective or ineffective."

Two members of an interdisciplinary research team (composed of 2 family physicians, 2 behavioral scientists, and an educator) independently read each narrative without predefined coding criteria or hypotheses. Using standard editing methods, [18] research team members individually developed a taxonomy of themes from his or her reading of the narratives, assigned 1 or more themes to each narrative, then grouped the narratives by theme. In a series of consensus-building meetings, common themes were consolidated and a codebook was developed. The interviews were then reread and coded. The research group met to further refine the analysis and choose sections of the narratives as exemplars.

RESULTS[^]

Thirty-seven narratives were completed, representing 100% of the students taking the clerkship in Rochester during the 1994-1995 academic year. We looked at outcomes as well as the process of learning.

OUTCOMES OF EDUCATIONAL CRITICAL INCIDENTS[^]

All but 3 of the narratives described brief events, where the disruption of the physician's schedule was judged to be less than 5 minutes. Many seemed to add very little additional time to the preceptor's workload. Twenty-six reports (70%) involved recognition and acquisition of new communication (10 students), procedural skills (9 students), or assessment skills (7 students). Five incidents (14%) resulted in new exposure to situations or skills that were valued for their own sake without any implied or direct use. Three incidents (8%) were identified because they prompted self-reflection, and 6 (16%) solely

because they reinforced a safe and collaborative learning atmosphere. Some of the narratives fell into more than 1 outcome category.

Students learned specific skills including conducting a focused history, using time effectively, evaluating undifferentiated symptoms, prioritizing concerns, setting limits, choosing medications, assessing compliance, understanding the patient's context, and introducing preventive medicine into office visits.

LEARNING PROCESSES[^]

Several different modes of learning emerged from the student narratives, including observational and collaborative learning, coaching, discussion outside of the examination room, advocacy, and affective education. These learning processes are described herein and illuminated with extracts from the student narratives.

Active Observation[^]

Incidents describing active observation accounted for 26 (70%) of the narratives. After identifying, either prospectively or retrospectively, a learning need, the students described having learned primarily by observing the preceptor explicitly demonstrating or otherwise modeling a skill or technique ([Figure 1](#)). Six of the 26 events involved the student approaching the preceptor after having become stuck, and asking for help with a specific part of the clinical assessment of a patient. Twenty of these incidents involved students recognizing their own deficiencies and learning needs after having observed the preceptor conduct during all or part of an office visit.

Figure 1. Active observation in clinical medical education.

One student reported a learning incident that involved only observation of the preceptor. The preceptor did not observe the student and there was no discussion of the case afterward. Nonetheless, the student related this as an influential event.

"This was an important lesson... in a 15-minute visit, creating a well-focused patient encounter without making the patient feel rushed... [my preceptor] eliminated a great deal of talk [not relevant to the patient's problem] by saying, "I know you have other important issues to talk about. But since we only have 15 minutes today, let's focus on the headaches and schedule another time to address your other concerns." The patient received this very positively."

In the following visit, the preceptor gave devastating news to a patient. The visit had little direct student involvement. Conducting this encounter independently, even under direct observation of the preceptor, would have been beyond the expectations of a fourth-year student. However, a detailed discussion afterward allowed the student to reflect on the visit and consolidate her thoughts with the implication that she would be able to

generalize principles of care for similar situations in the future. This was 1 of 2 incidents reported that involved a large investment of preceptor time.

"Dr A called a family meeting with the patient, her husband, and her 2 daughters to tell them the news [that the ultrasound examination was highly suspicious for ovarian cancer]. I was present at the meeting. It was particularly difficult because the patient was crying and telling Dr A that he should have waited until after Christmas to tell her. She kept saying, "I want to go home now." It was particularly educational to view how Dr A dealt with each family member. After the meeting, we spent 30 minutes discussing what went particularly good and bad with the meeting."

Following is another challenging visit, involving a homebound patient and her family. The student described how she was able to enter into a situation for which she would have been ill prepared, and identified strategies for interacting effectively in difficult situations.

"One episode that stands out in my mind was a house call that I made with N. R., the nurse practitioner in the practice. The patient was a 50-year-old woman with cerebral palsy, living in the same house where she was born.... Neither the patient nor her brother had been out of the house for 30 years. The visit was for a flu shot and checkup, but the social situation was quite unique.... This experience was important because I got to see an adult patient with a chronic illness being cared for at home. I also had the opportunity to interact with a very insular family that had a slightly adversarial relationship with health care providers. I saw how N. R. was able to deal with a hostile patient effectively, and give good care to the patient at the same time."

In the following case, the student became stuck in a difficult situation for which she had not been trained, and sought help. After the preceptor demonstrated a more focused approach, the student learned to use interpreters more effectively.

"After working with a [Ukrainian patient and an interpreter] for some time I interrupted the H & P to defer to Dr K. I felt that my process was too slow.... He demonstrated how to focus on the more immediate concerns, how to begin initial screening, and that further history could be obtained on subsequent visits."

Many of the learning incidents involved complex interactional skills in the ongoing management of chronically ill patients for which students had previously had little exposure. The following case demonstrates how the physician modeled the effective elicitation of information after the student had failed to do so. Before observing the physician, the student had no idea that there was information missing; however, the lessons learned by using more effective communication strategies were clear.

"I had been seeing a 78-year-old man for the first follow-up appointment after a new diagnosis of adult-onset diabetes. He had been checking his blood glucose religiously BID [twice-daily]... and his blood glucose was consistently about 200. We negotiated successfully a few dietary changes. When Dr O came in to talk to the patient, he asked

the simple question, "When are you checking your blood sugar?" It turned out that the patient was checking after meals instead of before. Lesson: it's important never to assume that the patient knows how to monitor [blood glucose and to] elicit [the patient's] understanding."

In this segment, the student had an idea that the patient had unexpressed fears, but could not elicit them effectively.

"Believing that she might be worried about developing cancer, I asked [the patient] if she believed that there might be something wrong with her. She denied any specific concerns. After I presented the case to Dr F, he pointed out that the patient's father had died of leukemia and that another close relative had died of lymphoma. Following a brief exam of the patient with reassurance that she was in good health, Dr F directly broached the issue of [the patient's] potential concern about cancer. [The patient] became somewhat tearful, explaining that she had been thinking about this possibility almost daily for the last 6 months. This scenario highlighted 2 points to me. First, that a cursory review of a patient's chart can be critical to an encounter. Second, that there are times when it can be beneficial to be fairly direct regarding psychological (and other) issues."

Collaborative Learning[^]_^

Eleven students (30%) noted the preceptor's ability to take a collaborative stance in correcting student errors. As in the case just described, learning was reinforced without the humiliation that often occurs after having been corrected. Preceptors accomplished this by observing, commenting on behavior in a nonjudgmental manner, defining the difficulty using "we," demonstrating new skills, and then letting the student perform the task again. Six of the 11 collaborative learning incidents pertained to learning physical examination skills and 5 related to communication skills. Following are 2 examples, both pertaining to learning physical examination skills.

"During one patient examination, I pronounced the patient's carotid arteries clear, while my preceptor felt there was a bruit on 1 side. He watched me listen to the carotids, then showed me that I was positioning my bell a bit too low in the neck, and that if I moved it up a little it would be over the carotid bifurcation where most bruits are more likely to be heard. He also showed me how to move the bell around and adjust its angle much like an ultrasound transducer. Indeed, I was able to hear the bruit using these maneuvers. My preceptor reassured me that my mistake was a common one in training, and that my ability and confidence would certainly improve with a bit more experience. After this incident, I was more comfortable with my physical exam and [my] ability to detect carotid bruits. Also, I was reassured that despite my mistake, I was felt to be performing at an appropriate level."

"A 37-year-old white man presented with a left elbow injury 2 weeks ago. He presented on a morning when we had seen a [patient with a] shoulder injury and a [patient with] chronic lower back pain, both of which I found frustrating because I have no orthopedic or sports medicine background. Dr G allowed me to conduct the H & P, and then precept with him. I fumbled through a limited differential, then expressed my "inadequacy." Dr G

was not at all critical of my lack of knowledge. We went back to see the patient together. While he performed his physical exam, he informed the patient he would be doing some "doctor talk" to teach me. (The patient was very open to that.) First he showed me a basic physical exam for the elbow joint (passive, active, resisted ROM [range of motion], etc). Then he described pathologies-tendinitis, for example, will have pain with active motion but not if we hold secure the damaged part of the tendon during the motion, etc."

Coaching[^]

Coaching was the primary educational method described by 5 students (14%). These were situations in which the preceptor helped build student self-confidence and skills to successfully complete a visit. In some cases the preceptor did the coaching in the room and in others in the hallway during an interruption in the encounter.

"In doing an orthopedic exam I read [about] the anatomy of joints before I went in to examine the patient. Dr L told me to also read and think about the maneuvers I would do, the results I would expect, and what an abnormal result would mean."

The student in the following situation would not have identified the well-child visit he had been conducting as incomplete without further coaching. Simple focused questions while demonstrating appropriate physical examination maneuvers cost the preceptor no additional time to teach and made an influential educational intervention.

"The preceptor observed my interactions with the patient. After I was through [with the examination], he demonstrated other things I needed to check for such as "Were the testicles descended?" and "Are the hips dislocated?""

Some preceptors "nudged" students to follow their intuition and best judgment-in this case, in a challenging situation.

"[After seeing a patient with unexplained abdominal pain and no physical findings], Dr R [and I] agreed that questions about sexual abuse or rape might be revealing. We went back in with her; after a short time I asked her about this fairly directly."

The patient was able to disclose a history of abuse to the student, which was therapeutic for the patient, reinforced the student's self-confidence, and demonstrated the importance of physician initiation of communication about "charged" topics.

Discussions Between Students and Preceptors[^]

Discussion between student and preceptor without direct observation of skills was noted by only 2 students (5%) and involved a greater investment of preceptor time than other reported events. Presumably, active observation, coaching, and collaborative interventions were incorporated into the patient visit, whereas discussion involved time separate from the visit and time to set the context of the discussions. From the students' descriptions, however, it was not clear to what extent these discussions were minilectures, Socratic questioning, or give-and-take exchanges of ideas.

"[My preceptor] methodically discussed and questioned my knowledge, adding skills that he has learned over the years in immunization schedules... developmental patterns... relevant physical exam points, so that time efficiency was maintained [in] addressing parental concerns [and] special needs of teenagers. In each of these situations I conducted the interview and exam myself."

Advocacy[^]

Although only mentioned explicitly once (3%), advocacy was a powerful ingredient in an important learning experience for this student. We include this category because advocacy was implicit in many of the other narratives where the preceptor had in some way expressed caring for the student and asked patients to help further the student's education by repeating sensitive personal information or agreeing to a second physical examination. This student was able to recognize what must be a common dilemma for community-based physicians-deciding how to balance that needs of the student with the care of the patient.

"The preceptor asked a patient with rectal cancer if I could do an exam for learning purposes and the patient agreed. I appreciated the preceptor's boldness and respect for my learning. I could feel the nodule and will be less likely to miss a similar finding in the future."

Affective Education[^]

The following segment explores a student's powerful reactions to caring for a patient who subsequently died unexpectedly. This was an emotionally powerful experience for the student, and helped to shape values and foster reflection. Affective aspects of care were subthemes in several other narratives as well.

"This was the first patient to die on my service. His death was unexpected. I was beside myself. I did not know what to say to his family, especially his widow. It seemed all the confidence that I ever had in my abilities vanished in that instance. All I could say was that I was sorry. I learned so much that night.... For the first time I felt human. I saw how frail life could be and yet how strong. [My] independence and active participation at all levels of patient care in this particular case allowed me to view myself and life differently. I thanked my preceptor for the privilege."

COMMENT[^]

This study was conducted to help community-based physicians who teach medical students recognize and build on effective educational strategies. Thus, we were impressed that 70% of senior medical students reported that active observation of an experienced family physician performing a clinical task was the single most important educational incident during their family medicine clerkship. These were, for the most part, situations in which students had significant clinical responsibility. Students are clearly watching their preceptors carefully, perhaps more so than preceptors realize! Because traditional faculty roles often emphasize teaching techniques rather than facilitation of learning, we had anticipated that more of the incidents would have been in the "coaching" or "discussion" mode and that more use would have been made of formal case presentations.

The critical incidents were problem-focused rather than based on abstract interest in a topic. This feature is consistent with adult learning theory. [3,10,11] Also, because students at this level have had enough clinical exposure to become aware of familiar patterns in clinical medicine, they were able to recognize the deviations from those patterns and to recognize when a preceptor did something differently than they themselves would have. The student at this level is "consciously incompetent" [12]; that is, he or she is aware of learning needs. In contrast, students who have had little prior clinical experience do not have the basis for organizing their observations and may be "unconsciously incompetent." They may not know appropriate questions to ask in a given situation, or there might be differences between the way they approach a problem and the way that is being modeled by the preceptor. Thus, relying on observation may not be as dependable a form of learning for less experienced students, and preceptors may need to be more explicit in describing their actions and the reasoning that underlies their clinical practice.

Deficiencies and difficulties were sometimes recognized by students during the clinical encounter with the patient, but more often they were not. Thus, the students appeared unable to identify their learning needs prospectively. Eventually, students recognized their learning needs, but often not until after they had observed the preceptor doing a task differently and more successfully than they had. This finding emphasizes the importance that students continue to be exposed to well-trained and experienced clinicians throughout medical school.

In most of the learning encounters that the students considered successful, the preceptor provided an alternative behavior in response to a student's stated or unstated learning needs. Many students were able to recognize and appreciate when preceptors offered nonjudgmental critique. It was not clear from many of the narratives, however, whether the preceptor consciously formulated a "learning prescription" for the student or whether he or she relied on intuitions that could be articulated later. In some cases, the preceptor had no way of knowing how important the learning event was to the student or what he or she was actually teaching. Also, some incidents were educational because of students' powerful affective responses. This implies that the preceptor's task is to address not only the technical aspects of care, but also the student's affect, values, and reflections on the incident. Faculty development often emphasizes planning and anticipating students' needs; our findings imply that preceptors also need to develop a moment-to-moment awareness of the learning potential of each encounter.

Learning through organized observation, as described by the students, starts from a concrete experience, which can then stimulate behavior change and generalization without reflection or abstraction; foster reflection and then abstraction, behavior change, and generalization; or lead to other kinds of personal change, such as learning about one's own values or affective style. The preceptor's first task is to become aware of potential learning opportunities by asking the student what he or she has observed; this is a process of making unconscious learning conscious, and unstated learning opportunities explicit. Then, the preceptor might review with the student which incidents were particularly educational to further define the student's learning needs. Finally, a plan can be developed to help the student generalize from those experiences and attend to affective

aspects of the educational experience. [19] Using active observation in this way will help students organize their observations of preceptors and also of themselves, which prepares them to be more effective lifelong learners. [12]

Our findings are supported by a recent study by Goertzen et al, [5] who used the critical incident technique to assess effective teaching behaviors of rural family medicine preceptors in Winnipeg, Manitoba. Their data reflected both preceptor and student input, and focused on teaching behaviors of preceptors rather than incidents in which the student felt he or she had learned something. They found that in addition to active student involvement and a supportive preceptor-student relationship, emphasis on clinical problem-solving and demonstration of clinical skills were important facets of the educational experience. Their study, however, could not account for the learning that occurs in the absence of formal or informal teaching.

The major limitation of our study is that we gathered data from students only. We have had the opportunity to present the results of this study to preceptors as part of faculty development courses and informal conversations; the results have "rung true" to their experiences with students, and explain some of the "Aha!" experiences that students report. To confirm these impressions, it would be illuminating to ask preceptors about the same events. Also, some of the students' responses may have reflected social desirability bias, as in any introspective self-report instrument. [20] Because the fourth-year clerkship was not a required course, the students were a self-selected group. Similar data from required clerkships, as well as from third-year and preclinical preceptorships, would provide comparison data and are currently being collected at our institution. Our expectation is that many of these findings will hold true for third-year students, but that lack of prior clinical exposure will make it difficult for preclinical students to observe actively and formulate learning goals in the same way as their more senior colleagues.

Through self-reported critical incident narratives we found that senior medical students can learn by actively observing experienced family physicians, but need a base of experience to organize their observations so that they can reflect on and then generalize what they learn. Collaboration, coaching, and advocacy were means whereby preceptors and students could create a learning environment that students felt was safe, allowed them to recognize their own learning needs, and helped them adopt new behaviors. Attention to the affective domain was an important ingredient in memorable learning events. Important learning events did not usually involve extended discussion or major disruption of practice schedules; most of the events described were brief, problem-focused, and had a practical outcome.

Accepted for publication April 14, 1997.

We thank the students who generously shared important experiences with us. We also thank Kathy Bohn, Beth White, and Betsy Frarey for their help with organizing data and manuscript preparation. Dr Epstein thanks the Robert Wood Johnson Foundation Generalist Physician Faculty Scholars Program for their support.

Reprints: Ronald Epstein, MD, Departments of Family Medicine and Psychiatry, University of Rochester, 885 South Ave, Rochester, NY 14620-2399 (e-mail: rmep@highland.rochester.edu).

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Education, Medical; Learning; Physicians' Offices; Preceptorship; Students, Medical

Accession Number: 00019499-199803000-00010

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