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Community-based Teaching: Defining the Added Value for Students and Preceptors

Ambulatory care training has an increasing presence on the medical education landscape. Mean training time in internal medicine ambulatory settings is approximately 30% for students and residents (1). Several studies have failed to demonstrate educationally meaningful differences in the subjective or objective evaluation of student competencies of those trained part-time in ambulatory settings compared with students trained entirely in the hospital (2–4).

Community-based teachers (CBTs) have been increasingly used for ambulatory-based clinical education of medical students. It has been estimated that 20% of practicing general internists teach medical students in their offices (5), and a national effort to train and support CBTs in this role has recently occurred (6). What remains largely unknown is what added value CBTs bring to the clinical education of medical students. As a result, we set out to answer two questions. First, are the measured competencies different for students trained part-time in CBT sites compared with those not trained in CBT sites? Second, what effect does community-based teaching have on preceptors?

STUDENT OUTCOMES

Sixteen articles were identified as being potentially relevant. Two articles listed CBT sites as a part of their internal medicine ambulatory training but were excluded because the CBT experience was not separately evaluated (7,8). Other articles were excluded for the following reasons: one focused entirely on the teaching process and not on learner outcomes (9), two used student log books as the only outcome variable (10,11), and one used student satisfaction as the only outcome (12). Nine articles were ultimately identified that met the following three criteria: students received training in clearly defined CBT sites, their competencies were compared with students with no CBT experience using objective outcome measures, and their CBT experience occurred in the United States (13–20).

Of the articles meeting the inclusion criteria, two were pediatric based, four were internal medicine based, and one each was based in family medicine, an interdisciplinary clerkship, and a preclinical introduction to clinical medicine (ICM) course. The duration of the CBT experience ranged from 4 to 12 weeks and involved 16 to 138 students. All studies were from a single institution and very few involved random allocation of students to CBT sites. Five studies compared CBT students with those trained in university-based ambulatory sites, and the remainder compared CBT students with those receiving an entirely inpatient experience. One study compared CBT students with both groups (Table) (16).

Five studies compared the difference in the clinical performance evaluations (CPEs) filled out by faculty. No differences were noted in three studies, and in the remaining two, the differences were small, 2.5% and 4.0%, and of questionable educational significance.

Of the seven studies that evaluated medical knowledge at the end of the clerkship, only one documented a difference between CBT and other students. This ambulatory pediatric experience noted a 4.8% lower mean final examination score of CBT students compared with those staying on campus; however, the failure rate on this examination was four times higher for CBT students (18% versus 3.9%) (20).

Three studies that compared objective structured clinical examination (OSCE) scores failed to demonstrate a difference between CBT students and other students.

Three studies compared student satisfaction, two of which compared CBT students and hospital-based students. Packman et al. (14) noted that the overall educational value of their internal medicine experience was rated excellent by 80% of CBT students versus 33% of hospital-based students. Rosebraugh et al. (16) noted that significantly more CBT students were highly satisfied with the patient mix, workload, faculty interest, and their personal involvement in patient care versus hospital-based students (range, 10% to 33% difference). However, when compared with students remaining "on-campus" for ambulatory experiences, only satisfaction with patient mix remained significant (16). Satran et al. (13) noted no differences in student perceptions of teaching quality or overall pediatric clerkship rating when CBT students were compared with hospital-based students.

Two studies compared clinical experience as reflected in student logs as an outcome variable (14,15). What is clear from these analyses is that students generally see more patients with a wider variety of problems in CBT settings. It is not clear if this translates into educationally

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Table. Student Outcomes for Community-based Educational Experiences

Speciality/ Author	Duration (Weeks)	Students (Number)	Randomization	Single Institution	Comparison Groups	Outcome Measures	Differences between Groups
Pediatrics							
Satran	6	138	Yes	Yes	CBT vs IP	OSCE	No
						Satisfaction	No
Malloy	12	61	No	Yes	CBT vs UBT	CPE	No
						MCQ	Yes
IM							
Packman	6	118	No	Yes	CBT vs IP	MCQ	No
						% Honors	No
						Log	Yes
						Satisfaction	Yes
						Career choice	No
Butterfield	4	16	Yes	Yes	CBT vs IP	MCQ	No
						Logs	Yes
Rosebraugh	4	58	Yes	Yes	CBT vs IP	CPE	No
						MCQ	No
						OSCE	No
						Satisfaction	Yes
Rosebraugh	4	102	No	Yes	CBT vs UBT	CPE	No
						MCQ	No
						Final grade	No
Solomon	4	89	No	Yes	CBT vs UBT	MCQ	No
						CPE	Yes
Preclinical							
Barclay	?	29	?	Yes	CBT vs IP	OSCE	No
Interdisciplinary							
Masters	4	26	?	Yes	CBT vs UBT	Clinical experience	No
						Number of teaching interventions	No
						Frequent teaching interventions	No
Family Medicine							
Schwiebert	4	54	No	Yes	CBT vs UBT	CPE	Yes
						Oral examination	No
						MCQ	No

CBT = Community-based teaching experience; UBT = University-based teaching experience; OSCE = objective structured clinical experience; MCQ = multiple choice questions; CPE = clinical performance evaluation.

meaningful outcomes, as exposure to clinical problems during a 1-month ambulatory experience embedded in a 12-week internal medicine clerkship revealed no correlation with better performance in diagnostic abilities (21).

Existing studies fail to demonstrate meaningful educational differences in student competencies as a result of part-time CBT training. However, the generalizabilty of these studies is limited by several factors, including small sample sizes, unique experiences with unique assessment tools, and the presence of many potential confounding variables. In addition, as Bordage et al. (22) noted in 1998, many studies lack clear a delineation of desired learning outcomes, and the identified outcomes are not consistently measured. Also, all the above studies were from a single institution and very few incorporated true experimental designs by randomly assigning students. Additionally, no study compared generalist ambulatory experiences with those offered in specialists' offices, and none specifically examined block versus longitudinal CBT experiences. Future studies at several sites varying in characteristics will be necessary to determine the added value to students of medical education in CBT settings.

PRECEPTOR OUTCOMES

Twenty-two articles were identified from the medical literature that contained data relevant to the impact of teaching on community-based teachers (5,23–42). Studies were excluded that dealt exclusively with hospital clin-

ics or university-based health maintenance organizations (HMOs). Also excluded were duplicate studies of the same teaching group. Six studies dealt exclusively with family practitioners (27,28,33,34,36,43), three with pediatricians (23,29,31), one with internists (41), and 12 with multiple specialties (5,24–26,30,32,35,37–40,42). Teachers were exclusively in private practice in eight studies (23,26,27,29,31,34,36,43), in staff model HMOs in three (25,32,41), and in multiple sites in 11 studies. The learners in 13 of the studies were exclusively medical students (5,23,24,26–28,30,33–35,37,40,42), were exclusively residents in five (23,29,31,32,41), were unspecified in one (38), and included multiple health profession trainees in two (36,39). Study methods were open- or closed-ended opinion survey questionnaires in eight (5,27,30,34–37,42), interview-based opinion surveys in one (43), and both in two (25,28). Five articles were qualitative descriptions of experience (29,31,32,40,42). Six studies examined billing data or patient encounter logs, or both (24–26,39,41), including one time-motion study (33). Two used questionnaire surveys as well as billing and log data, including a patient satisfaction survey in one (24,25). Comparisons were subjective impressions of teaching practitioners in nine articles (27,28,30,31,34,35,37,38,43), and subjective comparisons between teaching and nonteaching practitioners in two (5,36). Teaching physicians served as their own controls for cost and time analysis in three studies (24–26) and were compared with nonteaching partners in one (33). Two studies utilized multiple information sources and accounting models to compare costs (39,41).

As noted earlier, CBTs are prevalent. Most who teach continue to do so for many years, sometimes temporarily interrupting their teaching commitment in midcareer when family and other commitments prohibit (5,40). The impact of teaching on the CBT has been measurable in three domains: affective, cognitive, and tangible.

Affective Benefits

Twelve of the articles identified address the issue of the affective benefits of teaching (25,27,28,30–32,34–37, 40,43). They uniformly report these intrinsic benefits as primary reasons CBTs teach. Among North Carolina family practice community-based preceptors who were losing preceptor stipends, Slatt et al. (43) determined that their primary reward for teaching was interaction with students. Students made the practice of medicine more enjoyable and helped create excitement in the daily care of patients. None intended to stop teaching because of the loss of stipend. Surveys of private practitioners in other locales have produced similar results (25,28,30,32, 35–37). For example, the experience of 10 schools in the Interdisciplinary Generalist Curriculum (IGC) project found that the strongest impact on the IGC preceptors was in the joy of medicine (40). The IGC preceptors speak of the satisfaction of being an important part of the training of the next generation of physicians; their pride in contributing to growth in students' knowledge and skills; of being seen by students as a role model; of establishing the right values in impressionable students; and of teaching as a welcome return to the human side of medicine. ICG preceptors felt that an enthusiastic young learner helped remind them of why they became physicians.

Aside from the personal satisfaction of contributing to the development of young professionals, other affective benefits reported by CBTs include enhanced respect from patients and colleagues, increased staff satisfaction, and an increased motivation to keep up with recent developments (32,37).

The affective impact of teaching has not been uniformly positive. As many as 22% of CBTs report problems with unmotivated or unskilled learners (34,36). Although teaching students is generally associated with increased staff satisfaction, decreased staff satisfaction has been reported 8% of the time (37). The administrative burden of working with learners may contribute to physicians' general dissatisfaction with paperwork (40). However, CBTs who stop teaching do not typically cite these reasons for that decision (40).

Internists who teach are satisfied with their careers (44). Does this contentment arise from teaching or do they teach because they are content? In part, it may reflect the reinforcement teaching brings to other career endeavors. For physicians, important motivators for clinical work and sources of job satisfaction are the intrinsic rewards of patient care: patient contact, altruism, intellectual problem solving, and application of professional knowledge (45). Teaching may reinforce those values.

Cognitive Benefits

"To teach is to learn twice" is a widely held belief. Studies of CBTs reinforce this perception, but there have been no outcome studies to confirm it. When surveyed, 54% to 82% of CBTs have felt that they learned from their interaction with students (25,27,40). Some have cited learning from teaching as an important reward and motivator (36,40). CBTs perceive that teaching enhances the intellectual rigor of office practice (32) and stimulates professional growth (30,34). As many as 31% of CBTs feel that teaching increases the quality of patient care (25,35,37). Students request explanations for preceptors' actions, keeping the preceptor clinically alert (43). Teaching skills acquired as the result of teaching are a cognitive benefit, even without formal faculty development programs (28,36,40). CBTs who are active teachers report an increased tendency to stay current with the medical literature (35,37,40). In one study, 40% of CBTs stated that they spent more time keeping up with the literature, and 66% spent more time reviewing the basics of medicine as a result of teaching (37). In another study, 20% to 30% of CBTs reported that they had improved their techniques

for interviewing and for taking a sexual history, and had increased their use of the minimental state examination as the result of teaching and faculty development focused on those skills (28). In addition, 28.5% of CBTs report receiving continuing medical education (CME) credit for teaching (5).

Tangible Effects

The tangible impact of teaching in community settings has been the most rigorously studied. The focus has generally been on the effect learners have on practitioners productivity and workday duration. The most predictable tangible impact of community-based teaching has been on time factors, a theme mentioned in every study. The time required to teach has varied, in part by the level of the learner, how actively the learner participates in patient care, whether the rotation is a block or longitudinal, and whether the time cost is subjectively estimated or objectively measured. CBTs estimate that teaching requires 0 to 45 minutes (average, approximately 30) of their time per teaching half day (5,24,25,34,40). Measured time requirements using logs or time-motion studies have been similar (23,33). One study estimated a 10-minute differential in time spent teaching by generalists (43.5 minutes per half day) versus subspecialists (53.3 minutes per half day) (25).

To accommodate time needed to teach, practitioners in prepaid or clinic settings have diminished the number of patients seen per clinical session (5,25,37,41), whereas private practitioners have generally protected their productivity by increasing their work hours (26,27,33,34). In a few studies with advanced learners, practitioners have experienced no change in productivity or workday length or have even noted increased productivity (23,26,41). When productivity is measured using patient logs or billing data, the impact has been quite variable. Those measures in private practices demonstrate a decrease in 0 to 0.6 patients seen per half day teaching (23,26,33), with CBTs in HMO settings experiencing a broader range of 0 to 4.2 fewer patients seen per half day (25,41). When studied, physician estimates of changes in productivity have matched measured changes (25).

CBTs have experienced an array of tangible benefits. They have recruited partners from among their learners (30,32,34,35), giving them a recruiting edge over their nonteaching colleagues (31). It remains unknown if teaching improves retention of physicians in their practices (45). CBTs may be the recipients of plaques or certificates announcing their office as a teaching site, increasing their esteem with patients (5,40). They sometimes receive textbooks or discounts on CME courses (40,42), CME credit for teaching (5), and Internet and university digital library access (40,42). Some have been given clinical faculty appointments to medical schools as an expression of appreciation and recognition (40,42). A 1996 national survey estimated 9% of CBTs received a financial stipend, ranging from $200 to $2750 per student (5). A 1998 survey of clerkship directors revealed 13% to 22% of programs provide monetary compensation to nonsalaried clinical faculty (42). Physicians have ranked money in the mid range of the recognition they seek from teaching (43,44), outweighed by the affective benefits as noted above. One study compared the attitudes of 53 CBTs who received a stipend (average $4000 per year) with 37 who did not (38). Faculty who received salary support felt that it was more necessary than those who did not. Teaching loads and criteria for salary support are generally not mentioned in these studies, making it difficult to draw conclusions about the effect of such stipends.

The tangible effect on staff appears minimal, as CBTs have estimated 6 minutes of increased staff time per half teaching day (27).

Teaching requires space for the learner to see patients, to chart, and to hold conferences. Although institutions have allocated economic costs to this end, practitioners have generally not added space for learners. They have managed space needs by coordinating learners to match time their partners were away and by setting expectations for the amount of time learners will spend with patients (40). Still, space is sometimes perceived to be a problem (36).

Patient experiences with learners reflect on "their" physician and influence their perceptions of medical care. Influences have generally been quite favorable. A survey of preceptors whose patients experienced first-year medical students found that 83% of patients enjoyed their interaction with the student (28). A survey of patients seeing medical students in an HMO found 90.3% satisfied with the care provided by the student (25). No mention was made of patient satisfaction with the preceptor. CBTs have felt that learners increase patient satisfaction from the extra time and attention they get, increasing their stature with patients (25,37,40).

There comes a point where extra time spent in the office is an inconvenience (25,34,36). Occasionally patients (fewer than 1% to 5%) do not welcome learners (25,26). Those events can be mitigated by patient selection and patient education (46). In addition to influencing the affective experience of patients, learners may discover new information about patients that affects their care. In the one study where this was surveyed, it was estimated to occur 51% of the time (28). Furthermore, their presence has prompted preceptors to spend more time educating patients, usually jointly with the learner (35).

Community-based physicians may be reluctant to participate in community-based teaching because they believe they lack the talent to "teach." Many community physicians translate teaching as providing "lectures." However, in one study, the critical learning events that took place in office-based settings were focused on the

problem rather than on abstract reviews of a topic and had a practical outcome (12,47). These teaching moments took less than 5 minutes. The single most important learning event identified by students was observing an experienced physician interacting with a patient. This is not to suggest that the entire experience should be observational. To the contrary, students and residents need the opportunity to delivery independent care (seeing the patient alone first, then with the preceptor), but the opportunity to see an expert deal with a difficult problem is highly valued. Other highly rated learning events include improving communication and clinical skills (12,47). These are important skills that preceptors do well and that take little in the way of preparation to be effectively presented to the learner. The take-home message to office-based preceptors is that a learner participating in an office-based experience values learning the process of care as much as, or possibly more than, mastering core content. Students and residents crave real-world experiences caring for patients, and these are experiences that office-based practitioners can provide.

CONCLUSIONS

Students value their time with community preceptors, as reflected in their evaluations and ratings of CBTs (48,49). When students compare their community-based experience with other clerkships, the CBT experience was seen as contributing most to their acquisition of improved clinical and communication skills and awareness of issues relating to cost effectiveness. Comparing their community-based experience with traditional clerkship rotations, students report learning as much about disease pattern recognition and the ability to generate a differential diagnosis, and more about the management of chronic medical problems, evaluation of "hidden agenda" items, and the management of psychosocial problems (12,14,47).

The intrinsic rewards of community-based teaching have a significant beneficial effect on the satisfaction and sustenance CBTs and their staff experience. It promotes key elements that should make them better physicians. It requires of them about 30 minutes of productive or extra time per half day they teach, and it probably increases the work of their staff. More rigorous studies will be needed to ascertain if they do indeed become better practitioners, to determine the best way to enhance the benefits they experience, and to explore how to catalyze acquisition of those benefits by new teachers.

The concern that students assigned to ambulatory settings away from the academic health center will not master the required medical content is not supported by existing data. Furthermore, fears that the office-based experience does not sufficiently involve students in patient care also appear to be unfounded. Nevertheless, the true validation of these assertions awaits high quality multi-institutional studies with clearly identified learning outcomes measured in a consistent fashion.

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REFERENCES

1. Levinsky NG. A survey of changes in the proportions of ambulatory training in internal medicine clerkships and residencies from 1986–87 to 1996–97. *Acad Med.* 1998;73:1114–1115.
2. Pangaro L, Gibson K, Russell W, Lucas C, Marple R. A prospective, randomized trial of a six-week ambulatory medicine rotation. *Acad Med.* 1995;70:537–541.
3. Papadakis MA, Kagawa MK. A randomized, controlled pilot study of placing third-year medical clerks in a continuity clinic. *Acad Med.* 1993;68:845–847.
4. Kalet A, Schwartz MD, Capponi LJ, Mahon-Salazar C, Bateman WB. Ambulatory versus inpatient rotations in teaching third-year students internal medicine. *J Gen Intern Med.* 1998;13:327–330.
5. Vinson DC, Paden C, Devera-Sales A, Marshall B, Waters EC. Teaching medical students in community-based practices: a national survey of generalist physicians. *J Fam Pract.* 1997;45:487–494.
6. Bowen JL, Alguire P, Tran LK, Ferenchick GS, Esham R, Boulware DW, Branch WT, Kahn R, Horwitz RI. Meeting the challenges of teaching in ambulatory settings: a national, collaborative approach for internal medicine. *Am J Med.* 1999;107:193–197.
7. Davidson RA, Vega A, Edwards KI, Caranasos GJ. Introducing ambulatory care during the medicine clerkship: impact on evaluation and attitudes. *Am J Med Sci.* 1996;312:206–213.
8. Elnicki DM, Halbritter KA, Antonelli MA, Linger B. Educational and career outcomes of an internal medicine preceptorship for first-year medical students. *J Gen Intern Med.* 1999;14:341–346.
9. Nahvi S, Kesan SH, Coppola J, Crausman RS. Precepting in a community based internal medicine teaching practice: results of a time-motion study. *Med Health RI.* 2001;84:267–268.
10. Greer T, Schneeweiss R, Baldwin LM. A comparison of student clerkship experiences in community practices and residency-based clinics. *Fam Med.* 1993;25:322–326.
11. Kowlowitz V, Slatt LM, Kollisch DO, Strayhorn G. Monitoring students' clinical experiences during a third-year family medicine clerkship. *Acad Med.* 1996;71:387–389.
12. Prislin MD, Feighny KM, Stearns JA, Hood J, Arnold L, Erney S, Johnson L. What students say about learning and teaching in longitudinal ambulatory primary care clerkships: a multi-institutional study. *Acad Med.* 1998;73:680–687.
13. Satran L, Harris IB, Allen S, Anderson DC, Poland GA, Miller WL. Hospital-based versus community-based clinical education: com-

paring performances and course evaluations by students in their second-year pediatrics rotation. *Acad Med.* 1993;68:380–382.
14. Packman CH, Krackov SK, Groff GD, Cohen J. The Rochester practice-based experience. An experiment in medical education. *Arch Intern Med.* 1994;154:1253–1260.
15. Butterfield PS, Libertin AG. Learning outcomes of an ambulatory care rotation in internal medicine for junior medical students. *J Gen Intern Med.* 1993;8:189–192.
16. Rosebraugh CJ, Szauter K, Ainsworth MA, Solomon DJ, Speer AJ, DiPette DJ. Creating and evaluating an independent ambulatory internal medicine clerkship. *Am J Med Sci.* 1998;315:30–34.
17. Barclay DM III, McKinley D, Peitzman SJ, Burdick B, Curtis M, Whelan GP. Effect of training location on students' clinical skills. *Acad Med.* 2001;76:384.
18. Masters PA, Nester C. A study of primary care teaching comparing academic and community-based settings. *J Gen Intern Med.* 2001; 16:9–13.
19. Solomon DJ, Rosebraugh CJ, Speer AJ, Holden MD, Szauter KM. The impact of the location and structure of an ambulatory rotation on cognitive knowledge and performance. *Eval Health Prof.* 1999; 22:197–207.
20. Malloy MH, Speer A. A comparison of performance between third-year students completing a pediatric ambulatory rotation on campus vs in the community. *Arch Pediatr Adolesc Med.* 1998;152:397–401.
21. Gruppen LD, Wisdom K, Anderson DS, Woolliscroft JO. Assessing the consistency and educational benefits of students' clinical experiences during an ambulatory care internal medicine rotation. *Acad Med.* 1993;68:674–680.
22. Bordage G, Burack JH, Irby DM, Stritter FT. Education in ambulatory settings: developing valid measures of educational outcomes, and other research priorities. *Acad Med.* 1998;73:743–750.
23. Sargent JR, Osborn LM. Resident training in community pediatricians' offices. Not a financial drain. *Am J Dis Child.* 1990;144:1356–1359.
24. Pawlson LG, Watkins R, Donaldson M. The cost of medical student instruction in the practice setting. *J Fam Pract.* 1980;10:847–852.
25. Kirz HL, Larsen C. Costs and benefits of medical student training to a health maintenance organization. *JAMA.* 1986;256:734–739.
26. Fields SA, Toffler WL, Bledsoe NM. Impact of the presence of a third-year medical student on gross charges and patient volumes in 22 rural community practices. *Acad Med.* 1994;69(suppl):87–89.
27. Vinson DC, Paden C. The effect of teaching medical students on private practitioners' workloads. *Acad Med.* 1994;69:237–238.
28. Usatine RP, Hodgson CS, Marshall ET, Whitman DW, Slavin SJ, Wilkes MS. Reactions of family medicine community preceptors to teaching medical students. *Fam Med.* 1995;27:566–570.
29. Charney E. Medical education in the community: the primary care setting as laboratory and training site. *Pediatr Ann.* 1994;23:664–668.
30. Foley R, Yonke A, Smith J, Roe B, Vance J. Recruiting and retaining volunteer community preceptors. *Acad Med.* 1996;71:460–463.
31. Young LM. The perspective of the community pediatrician. *Pediatrics.* 1996;98:1255–1292.
32. Shorey JM, Epstein AL, Moore GT. The clinician-teacher in managed care settings. *J Gen Intern Med.* 1997;12(suppl 2):98–103.
33. Ricer RE, Van Horne A, Filak AT. Costs of preceptors' time spent teaching during a third-year family medicine outpatient rotation. *Acad Med.* 1997;72:547–551.
34. Levy BT, Gjerde CL, Albrecht LA. The effects of precepting on and the support desired by community-based preceptors in Iowa. *Acad Med.* 1997;72:382–384.
35. Fulkerson PK, Wang-Cheng R. Community-based faculty: motivation and rewards. *Fam Med.* 1997;29:105–107.
36. Gray J, Fine B. General practitioner teaching in the community: a study of their teaching experience and interest in undergraduate teaching in the future. *Br J Gen Pract.* 1997;47:623–626.
37. Grayson MS, Klein M, Lugo J, Visintainer P. Benefits and costs to community-based physicians teaching primary care to medical students. *J Gen Intern Med.* 1998;13:485–488.
38. Christiansen RG, Wark K, Levenstein JP. Attitudes of part-time community internal medicine faculty about their teaching. *Acad Med.* 1992;67:863–864.
39. Boex JR, Boll AA, Franzini L, Hogan AJ, Irby D, Meservey PM, Rubin RM, Seifer SD, Veloski JJ. Measuring the costs of primary care education in the ambulatory setting. *Acad Med.* 2000;75:419–425.
40. Ullian JA, Shore WB, First LR. What did we learn about the impact on community-based faculty? Recommendations for recruitment, retention, and rewards. *Acad Med.* 2001;76(suppl):78–85.
41. Stern RS, Jennings M, Delbanco TL, Dorsey JL, Stoeckle JD, Lawrence RS. Graduate education in primary care: an economic analysis. *N Engl J Med.* 1977;297:638–643.
42. Kumar A, Loomba D, Rahangdale RY, Kallen DJ. Rewards and incentives for nonsalaried clinical faculty who teach medical students. *J Gen Intern Med.* 1999;14:370–372.
43. Slatt L, Eglehoff C, Sloane P. Why do preceptors teach? *Fam Med.* 1984;16:189–190.
44. Alguire P. ACP-ASIM survey of community preceptors. Unpublished study.
45. Gerrity MS, Pathman DE, Linzer M, Steiner BD, Winterbottom LM, Sharp MC, Skochelak SE. Career satisfaction and clinician-educators. The rewards and challenges of teaching. The Society of General Internal Medicine Career Satisfaction Study Group. *J Gen Intern Med.* 1997;12(suppl 2):90–97.
46. Skeff KM. Enhancing teaching effectiveness and vitality in the ambulatory setting. *J Gen Intern Med.* 1988;3(suppl):26–33.
47. Epstein RM, Cole DR, Gawinski BA, Piotrowski-Lee S, Ruddy NB. How students learn from community-based preceptors. *Arch Fam Med.* 1998;7:149–154.
48. Irby DM, Gillmore GM, Ramsey PG. Factors affecting ratings of clinical teachers by medical students and residents. *J Med Educ.* 1987;62:1–7.
49. Schwiebert LP, Ramsey CN Jr, Davis A. Comparison of volunteer and full-time faculty performance in a required third year medicine clerkship. *Teach Learn Med.* 1992;4:225–232.