A Study of Primary Care Teaching Comparing Academic and Community-based Settings

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***OBJECTIVE*: To compare teaching activity and content between academic and community-based practices used in third-year medical student primary care training.**

***SETTING:* Academic and community-based primary care practices participating in third-year internal medicine, family medicine, and primary care core clerkships.**

***PARTICIPANTS:* Five-hundred thirteen preceptor-student encounters involving 32 preceptors and 26 third-year medical students were evaluated.**

***DESIGN:* Student-preceptor pairs collected a convenience sample of data from shared patient encounters. Preceptors recorded the content of teaching interventions, and students independently documented learning points received for each clinical encounter.**

***MEASUREMENTS AND MAIN RESULTS:* Comparison of problem exposure, frequency and content of teaching interventions, and the effect of patient complexity and patient care workload on teaching frequency was made between the academic and community-based practices. Several small differences were found in the frequency of clinical problem exposure between the two settings. The frequency and focus of teaching interventions did not differ by practice type. Teaching by community-based preceptors tended to decrease with increased patient care workload but increased in academically based practices.**

***CONCLUSIONS:* Although several differences exist between educational experiences in community- and academically based primary care practices, they appear to be minor and of minimal educational significance.**

***KEY WORDS:* primary care training; medical students.**
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The recent emphasis on exposing undergraduate medical students to primary care has encouraged the movement of an increasing proportion of third-year clinical training from ambulatory sites based at academic medical centers to community practices.[1] Although this shift in educational venue has recently been studied in terms of preceptor productivity,[2–4] cost,[5,6] and student and patient satisfaction,[7,8] the potential effects on the educational process have been less well investigated.

The transfer of teaching responsibilities from academically based teaching faculty to full-time clinicians in busy primary care practices has raised several questions of importance to medical educators. Specifically, how do teaching efforts by community-based preceptors compare with those by designated teaching faculty? Is the ambulatory educational experience in the community comparable to that at academically based training sites?

To address these issues, we compared the nature and content of teaching interventions with third-year students in community-based primary care practices with those occurring in academically based sites.

METHODS

Adult primary care training in the third year at the Pennsylvania State University College of Medicine occurs in the context of three core clerkships. A four-week primary care rotation places students in exclusively community-based internal medicine and family medicine practices in rural or underserved areas of Pennsylvania. A monthlong family medicine clerkship uses both College of Medicine faculty and community-based family physicians for primary care training. Students in these rotations participate in primary care clinical activities on a full-time basis. A weekly, half-day primary care experience in the two month internal medicine clerkship is staffed by a mix of College of Medicine faculty and community-based general internists. Medical students and their preceptors participating in these clinical experiences constituted the study group.

Practices were designated as academic if they were based within the faculty practice system of the academic medical center and located physically at or near the academic medical center complex with full-time College of Medicine faculty functioning as preceptors. Each of the faculty in this group maintains a full academic appointment in the College of Medicine and spends a minimum of 20% (range, 20% to 60%) of their time engaged in teaching, research, or academic administration in addition to clinical duties. Community practices were defined as private practices located physically away from the academic medical center with no affiliation with the College of Medicine beyond voluntary, noncompensated training of medical students. Although preceptors in this group hold clinical teaching appointments in the College of Medicine, their primary responsibility is the full-time provision of clinical services without additional academic responsibilities. Training sites not meeting these criteria, such as affiliated hospitals and clinics with dedicated teaching staff, were excluded from the study.

The academic health center is located in a semirural area of central Pennsylvania with the faculty practices providing primary care services to a nonurban, nonminor-

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ity, middle-socioeconomic-level patient population from a multicounty region surrounding the academic health center complex. The community practices in the study are widely dispersed geographically throughout Pennsylvania, serving mostly rural and medically underserved, nonurban areas. This patient population also tends to be nonminority with a broader range of medical and economic resources than seen at the academic medical center.

At the beginning of each clinical rotation cycle during the study period, students and their preceptors meeting the inclusion criteria were voluntarily enrolled and asked to collect a convenience sample of data from up to a maximum of eight half-day clinic sessions.

For each study session, students recorded baseline data for each patient, including age, whether they had seen the patient before, the specific presenting problem or problems related to that visit, and their concurrent active medical diagnoses. Students were then asked to write down the specific items they learned from their preceptor for each patient encounter. Preceptors simultaneously recorded the teaching points they attempted to make with their student for each patient seen jointly during the study session. Preceptors also indicated the total number of patients seen by them (with and without the student) to assess their workload during the study session. Students and preceptors were asked to record this information immediately following the patient encounter without sharing the content of their data.

The resulting student and preceptor data sets for each study session were paired, and baseline information was recorded for each patient encounter by specialty and practice type. The data sets were then blinded to the principal investigator, who extracted and recorded presenting problem data for each encounter. Each preceptor teaching intervention was classified into one of 13 predetermined categories, and an assessment was made as to whether the teaching point related directly to the presenting problem or whether teaching focused on a secondary or unrelated diagnosis or topic. Learning points as perceived by the student were recorded for each shared patient encounter.

Baseline data were used to profile practices by specialty and type. Data analysis included calculation of the average number of teaching interventions per patient by preceptor and comparison of teaching interventions as described by preceptors with those perceived by students. Diagnoses and the nature of teaching points made by preceptors were compared between practice type. The frequency of teaching interventions was correlated with patient complexity and the patient care workload of the preceptor during the study sessions. Statistical evaluation was performed utilizing two-sample t testing, a weighted κ statistic, χ^2 analysis, and Spearman's correlation statistic.

RESULTS

Data were collected during academic years 1997–1998. Three hundred twenty-eight encounters involving 20 preceptors in community-based practices and 185 encounters involving 12 preceptors in academically based settings were studied. Twenty-six third-year medical students participated in the study. Two students (7%) and three preceptors (8.6%) eligible for participation declined enrollment in the study. The nonparticipating preceptors were all community-based physicians; time considerations were cited by two of these individuals as the reason for declining to participate.

No significant differences were found in mean age or time since board certification between the community-based preceptors and their academically based counterparts. The average number of patients seen by the preceptor (with and without the student) per studied clinic session also did not differ significantly (12.9 patients per session in community practices vs 12.0 patients per session in academically based practices, $P = .37$). Preceptors in academic settings averaged 10.4 years of student teaching, while those in community practices averaged 6.7 years' experience as a preceptor ($P = .14$).

Table 1 profiles the studied practices by specialty. Several specialty-related differences were noted, such as an older mean adult age and more concurrent medical problems per patient in internal medicine practices. Academic family medicine practices saw a significantly older adult patient population than those in the community, but no other substantial differences were noted. The characteristics of the internal medicine practices based in academic settings did not differ from community-based sites. The average number of patients seen by students during each session and the number of teaching interventions per patient were similar both within and between specialties. Agreement of preceptor teaching with student documentation tended to be higher in internal medicine practices. Although small differences in the relationship of teaching interventions to the presenting problem were seen between practice type, the level of agreement of both variables in each specialty was high. When the studied variables were pooled by location, no significant differences were found between academic and community-based practices (Table 2).

The ten most commonly encountered diagnoses are listed in Table 3. These diagnoses constituted over half of the problems seen in both settings, with eight of the ten problems common to both academic and community-based practices. Routine physical examinations and hypertension were significantly more common in academic settings, with community practices tending to see more instances of bronchitis and respiratory tract infection.

Table 4 compares the percentage of total teaching interventions within the thirteen predetermined categories made by preceptors during the study. There were no differences in the content area of teaching interventions between practice type, except for slightly increased exposure to patient counseling in academically based settings.

Table 5 examines the effect of patient complexity and preceptor workload on the frequency of teaching interven-

Table 1. Comparison of Academic and Community-based Teaching Sites by Specialty

	Family Medicine			Internal Medicine		
	Academic	Community	*P* Value	Academic	Community	*P* Value
Number of encounters evaluated	87	204		98	124	
Mean age of adult patients, y	57.5	48.7	.007*	59.8	59.7	.96
Pediatric encounters, %	13.4	16.9	.54	N/A	N/A	
Mean number of concurrent medical problems per patient	1.4	1.2	.37	2.2	2.4	.37
Mean number of teaching interventions per patient	1.8	2.1	.5	2.1	2.1	.76
Agreement of preceptor teaching interventions with student documentation†	0.8	0.78	—	0.94	0.93	—
Mean number of patients seen by student per session	3.8	3.9	.88	3.9	4.4	.15
Percentage of patients seen by students more than once	6.0	5.6	.91	4.6	12.1	.12
Percentage of teaching interventions directly related to presenting problem‡	87.9	97.5	.03*	100	95.2	.04*

* *Statistically significant.*

† *Zero indicates no agreement, and 1 indicates full agreement between the documented content of the teaching intervention made by the preceptor and the learning point received by the student.*

‡ *The percentage of preceptor teaching interventions in which the focus was related specifically to the presenting diagnosis or problem.*

tions. The number of teaching interventions per study session tended to increase slightly in frequency in both settings as the number of concurrent medical problems increased. Teaching frequency also increased when more patients were seen by the preceptor per session in academically based practices but declined with increased workload in community-based sites.

DISCUSSION

This study demonstrated that while differences exist between primary care training experiences in community-based practices and those seen in academically oriented settings, they appear to be minor and of minimal educational significance.

The differences in frequency of exposure to common primary care problems between practice type are consistent with a prior study comparing clinical encounters in residency-based family practice clinics and private practices.[9] These authors concluded that student experiences were adequate to meet curricular goals in either setting. The current study also confirms that clinical preceptors in both practice types tend to teach about what they see and treat, with a relatively limited number of diagnoses constituting a majority of encounters in primary care practices. This finding is consistent with other studies of ambulatory clinical exposure[10–12] and requires consideration in establishing curricular goals when using these clinical experiences in undergraduate training. Continuity experiences, often considered a central aspect of primary care training, were low in both settings.

Minimal differences were found between the studied educational variables by practice site, including the number of patients seen per session by students, the rate of teaching interventions by preceptors, the reception of these teaching interventions by students, and the categories in which teaching points were made. This suggests that at least the quantitative aspects of teaching are similar between the two settings.

An interesting difference noted between academic and community-based teaching in the study was the effect of the preceptor's clinical workload during the study ses-

Table 2. Comparison of Academic and Community-based Teaching Sites By Location

	Academic	Community	*P* Value
Number of encounters evaluated	185	328	
Mean age of adult patients, y	58.3	55.8	.24
Mean number of concurrent medical problems per patient	1.8	1.9	.38
Mean number of teaching interventions per patient	2.0	2.1	.27
Agreement of preceptor teaching inventions with student Documentation*	0.88	0.87	—
Mean number of patients seen by student per session	3.9	4.0	.47
Percentage of patients seen by students more than once	5.4	9.4	.16
Percentage of teaching interventions directly related to presenting problem†	94.5	96.1	.45

* *Zero indicates no agreement and 1 indicates full agreement between the documented content of the teaching intervention made by the preceptor and the learning point received by the student.*

† *Indicates the percentage of preceptor teaching interventions in which the focus was related specifically to the presenting diagnosis or problem.*

Table 3. Ten Most Commonly Encountered Diagnoses

Diagnosis	Academic Frequency, %	Community Frequency, %	*P* Value
Routine physical	13.8	7.7	.03*
Hypertension	12.6	6.8	.03*
Routine physical	6.9	5.8	.63
Musculoskeletal	5.2	5.1	.99
Dermatology	4.0	7.4	.14
Chest pain	2.9	2.6	.86
Psychiatric	2.3	2.9	.78
Bronchitis/URI	1.7	5.5	.06
Genitourinary	4.6	4.8	—
Hyperlipidemia	2.9	2.9	—
Other diagnoses	43.1	48.5	—

* *Statistically significant.*
URI indicates upper respiratory infection.

sions on the frequency of teaching interventions. Although the mean number of patients seen by preceptors per studied session was similar in both settings, those in academic sites appeared to teach more as the number of patients increased, while teaching interventions in community-based sites tended to decrease with greater preceptor workload. If this effect is real, it may reflect increased productivity and patient service pressures in community-based practices relative to academic institutions or perhaps differences in the preceptor's "management" of the teaching process with fluctuation in workload. It also raises the question of whether there exists an "ideal" level of patient care activity by the preceptor that maximizes educational activity. Because it is not clear that this statistical finding translates into a significant influence on the educational experience, confirmation of this effect and further investigation of its significance is warranted.

Table 4. Frequency of Teaching Intervention by Category, %

	Academic	Community	*P* Value
Pharmacotheraphy	14.1	14.9	.72
Chronic disease management	16.0	14.6	1.55
Management of common ambulatory problems	10.8	11.5	.76
History and physical diagnosis skills	12.7	10.9	.37
Diagnostic testing	9.2	10.4	.53
Differential diagnosis	9.2	9.2	.99
Pathophysiology	7.9	8.8	.61
Clinical presentation of disease	8.9	8.3	.74
Health maintenance and disease prevention	5.1	4.5	.62
Psychiatric	0.8	1.9	.19
Compliance issues	1.1	1.8	.44
Dermatology	0.3	1.6	.07
Patient counseling	3.8	1.5	.03*

* *Statistically significant.*

Table 5. Effect of Patient Complexity and Preceptor Work Load on Frequency of Teaching Interventions

	Correlation of Frequency of Teaching Interventions	
	Number of Concurrent Medical Diagnoses*	Number of Patients Seen by Preceptor per Study Session*
Academic	0.241 (P = .0032†)	0.506 (P = .001†)
Community	0.269 (P = .0001†)	−0.247 (P = .028†)

* *A correlation of 0 indicates no relationship, 1 indicates a perfect positive relationship, and −1 indicates a perfect negative relationship between the variables.*
† *Statistically significant.*

Preceptor-reported teaching information was used as primary data in this study to determine actual teaching intent by primary care preceptors. The relatively high level of agreement found between the studied teaching interventions and the learning points documented by students supports the validity of logbook data as a means for tracking primary care clinical exposure and teaching by preceptors.[11]

The study results are limited by a design that potentially favored enrollment of community-based preceptors with a greater interest level in teaching, more experience, and possible increased exposure to faculty development efforts. As designed, however, the study suggests it is possible for third-year medical students to receive equivalent quantitative educational exposures in community or academically based primary care practices.

This study did not address several other key factors that likely affect teaching and learning in primary care settings. Despite similar quantitative aspects, the quality and accuracy of individual teaching interventions may differ between academic and community-based preceptors. Additionally, substantial differences may exist in the teaching methods and the time spent in teaching activities by preceptors in each setting. Whether the ability to communicate the less tangible aspects of primary care medicine, such as physician role-modeling and the understanding of psychosocial influences affecting an individual's medical care, differs between practice type is also unknown. These issues remain important considerations for future primary care education research.

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