Clinical Experience of Medical Students in Model Family Practices and Private Family Practices

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The clinical experience of 21 Duke medical students during their family medicine clerkship is analyzed to compare experience in model family practices with that in private family practices. In model practices where 50 percent of the time involved patient care, students saw an average of 41 different patients for 45 encounters and 73 problem contacts during the month. In private practices with 100 percent time devoted to patient care, students saw 140 patients for 193 encounters and 346 problem contacts during the month. Most patients were seen in the physician office in both sites (89.0 percent model and 70.4 percent private), but fewer were seen as hospital inpatients in the model than in the private practices (6.3 vs 25.7 percent). The types of patient problems were alike, with the same 11 problems ranking in the top 15 most frequently seen in the two locations. The major difference in experience relates to the larger volume of patients and problems encountered in the private than in the model sites.

Since the American Board of Family Practice was established in 1969, family medicine residency programs have developed medical practices for the purpose of training residents and medical students in ambulatory patient care. These model practices necessarily differ from usual private practices with regard to the number of learners participating in patient care. In an effort to determine how the clinical experience offered these learners differs between the two sites and whether the educationally oriented model practices are true reflections of the more service-oriented private practices, a study was developed to address these questions with regard to the patient volume, demographic characteristics, and health problems that comprise the clinical experience of medical students in the required family medicine clerkship at Duke University School of Medicine.

METHODS

Duke University School of Medicine in Durham, North Carolina, is a private school with 114 students in each entering class. The curriculum consists of a first year of required basic science, a second year of required clinical clerkships, and the last two years of electives equally divided between basic and clinical courses. Since 1981 the second-year two-month clerkships have included a family medicine clerkship in addition to those in internal medicine, surgery, pediatrics, obstetrics-gynecology, and psychiatry. Clinical experience during the family medicine clerkship has been compared with that in the other five clerkships in a previous report.[1]

During the family medicine clerkship students spend one month in model family practices affiliated with Duke Medical Center and one month in private community family practices, mostly within North Carolina. Students participate in supervised patient care during 100 percent of their time in the private sites and 50 percent in the model practices, with the remaining time spent in didactic sessions.

The clinical experience data for this study were collected by medical students on 3×5 encounter cards that provide space for information concerning the type and location of the encounter, demographic characteristics of the patient, and the type of health problems contacted.[2] For ambulatory patients each visit was counted as one encounter. For hospitalized patients each day a patient was visited was counted as one encounter. Health problems were labeled according to

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TABLE 1. COMPARISON OF MODEL AND PRIVATE PRACTICE TEACHING SITES WITH REGARD TO FREQUENCY OF PATIENTS, ENCOUNTERS, AND PROBLEM CONTACTS PER STUDENT PER MONTH

Type of Clinical Experience	Teaching Sites* Model Practices Mean (Range)	Private Practices Mean (Range)
Different patients	41 (23-58)	140 (40-336)
Patient encounters	45 (26-72)	193 (47-348)
Problem contacts	73 (30-124)	346 (83-875)
Encounters per patient	1.1 (1.0-1.4)	1.4 (1.1-3.2)
Problem contacts per patient	1.8 (1.2-2.7)	2.5 (1.3-6.2)

Student time available for patient care is 100 percent in the private practices and 50 percent in the model practices

TABLE 2. COMPARISON OF MODEL AND PRIVATE PRACTICE TEACHING SITES WITH REGARD TO PERCENTAGE OF DISTRIBUTION OF ENCOUNTERS PER STUDENT PER MONTH

Location of Encounter	Teaching Sites Model Practices (n=45) (%)	Private Practices (n=193) (%)
Physician office	89.0	70.4
Hospital inpatient	6.3	25.7
Hospital outpatient	0.4	1.6
Nursing home	1.8	1.1
Home	2.0	0.2
Health clinics	0.0	0.4
Other sites	0.5	0.6
Total	100.0	100.0

TABLE 3. COMPARISON OF MODEL AND PRIVATE PRACTICE TEACHING SITES WITH REGARD TO PERCENTAGE OF DISTRIBUTION OF AGE, SEX, AND RACE OF DIFFERENT PATIENTS PER STUDENT PER MONTH

	Teaching Sites Model Practices (n=41) (%)	Private Practices (n=140) (%)
Age (years)		
Under 15	16.1	18.9
15-24	20.8	14.4
25-44	34.7	22.6
45-64	14.3	20.8
65 and over	14.1	23.3
Total	100.0	100.0
Sex		
Female	63.7	57.3
Male	36.3	42.7
Total	100.0	100.0
Race		
White	74.7	83.1
Nonwhite	25.3	16.9
Total	100.0	100.0

the International Classification of Health Problems in Primary Care (ICHPPC).[3] Each student-patient transaction with regard to one problem was defined as a problem contact.

Only active encounters, those in which the student actually participated in the evaluation or management of the patient, were included in the analyses. To facilitate comparison of clinical experience between the two sites, analyses show student clinical experience in terms of average experience per student per month of the clerkship.

RESULTS

These data represent the clinical experience of 21 students collected in 1981 and 1982 during an 18-month period. Fourteen students received their model practice experience in the Duke-Watts Family Medicine center, where patients are cared for by 39 family medicine residents and 14 full-time family medicine faculty. The other seven students saw patients in the Pickens Family Clinic, a family practice based on the Duke Medical Center Campus, and in the Family Clinic South and Family Clinic East, two satellite family practices located in suburban Durham. In the latter three sites patients are seen primarily by five full-time

TABLE 4. COMPARISON OF MODEL AND PRIVATE PRACTICE TEACHING SITES WITH REGARD TO PERCENTAGE OF DISTRIBUTION OF PROBLEM CONTACTS PER STUDENT PER MONTH

	Teaching Sites			
	Model Practices		Private Practices	
Problem Category	Percentage (n=73)	Rank	Percentage (n=346)	Rank
Circulatory problems	10.4	4	17.0	1
Signs and symptoms	13.4	2	11.7	2
Respiratory problems	10.5	3	11.4	3
Supplementary classification*	17.6	1	8.3	4
Endocrine problems	5.2	9	6.4	6
Musculoskeletal problems	7.0	5	5.9	8
Genitourinary problems	6.9	6	5.8	9
Digestive problems	3.2	11	6.6	5
Injuries	4.8	10	6.1	7
Mental problems	6.4	7.5	4.8	10
Neurological problems	6.4	7.5	4.6	11
Infections	2.7	13	3.5	12
Skin problems	2.9	12	3.2	13
Neoplasms	1.4	14	3.1	14
Blood problems	0.6	15	1.0	15
Congenital anomalies	0.3	16	0.4	16
Pregnancy	0.2	17	0.2	17
Perinatal problems	0.1	18	0.0	18
Total	100.0		100.0	

Includes general medical examination, prophylactic procedures, and socioeconomic problems

Duke faculty family physicians with minimal resident participation. Full family medical services including obstetrics are offered in all four model sites.

The private practice experience was obtained in 17 different sites, 10 in North Carolina, 3 in Virginia, and 1 each in Maryland, South Carolina, Georgia, and Florida. These sites are well-established solo or small-group practices that are service oriented. All practices, both private and model, operate on a fee-for-service basis. All participating family physicians are certified by the American Board of Family Practice or maintain active membership in the American Academy of Family Physicians.

Each student recorded the experience for one full month in each of the two teaching sites. Some students saw patients in model practices the first month and in private practices the second, while other students worked in the private sites first. The total recorded experience involved 3,786 different patients on 4,990 encounters with 8,798 problem contacts.

Comparison of mean values per student per month between model and private sites is shown in Table 1. Volumes of patients, encounters, and problem contacts in private practices were approximately twice those in model practices, even after allowing for the increased time available for patient care in the private setting. This difference holds true both for students who took the private practice rotation first and for those who had it following the model practice experience.

The larger number of encounters per patient (1.4 vs 1.1) and problem contacts per patient (2.5 vs 1.8) in private practices can be explained partly by the larger percent of encounters with hospital inpatients (25 percent inpatients in private practices vs 6.3 percent in model practices), as shown in Table 2. In the hospital setting patients were seen repetitively on successive days. Hospital experience was limited in the model sites because daily morning didactic sessions prevented students from accompanying faculty on hospital rounds. The larger proportion of home visits in the model practices is explained by the course requirement that each student make a home visit to interview a family. Student experience with home visits is minimal in both sites.

There are wide variations in volume of experience among different students as indicated by the large ranges in Table 1. Numerous factors potentially contribute to this variation, including differences related to practice site (volume, patient mix, and rate of hospitalization), preceptor (style of teaching and willingness to delegate responsibility to students), and student (compulsiveness, level of interest in clinical medicine, and previous clinical experience on other clerkships). These factors were not measured in the present study.

Demographic comparisons between private and

TABLE 5. COMPARISON OF MODEL AND PRIVATE PRACTICE TEACHING SITES WITH REGARD TO THE 15 MOST FREQUENT PROBLEM CONTACTS PER STUDENT PER MONTH

Problems (ICHPPC codes) by Teaching Sites	Teaching Sites: Model Practices Percentage (n=73)	Model Practices Rank	Private Practices Percentage (n=346)	Private Practices Rank
Both model and private offices:				
Medical examination, no disease detected (y00-)	9.7	1	4.6	2
Hypertension, uncomplicated (401-)	5.7	2	6.9	1
Acute upper respiratory tract infection (460-)	5.0	3	4.4	3
Diabetes mellitus (250-)	2.2	5	3.9	4
Obesity (277-)	1.9	7	1.3	15
Low back pain (7289)	1.9	8	1.5	12
Depressive neurosis (3004)	1.8	9	1.8	7
Abdominal pain (7855)	1.7	10	1.7	9
Acute otitis media (3810)	1.6	12	1.4	14
Cystitis and urinary tract infection (595-)	1.6	13	2.6	5
Acute bronchitis (466-)	1.4	14	1.5	13
Model offices only				
Prenatal care (y61-)	3.5	4		—*
Osteoarthritis (713-)	2.1	6		—
Other nervous system disease (355-)	1.7	11		—
Vaginitis (6221)	1.4	15		—
Private offices only				
Chronic ischemic heart disease (412-)		—*	2.6	6
**Other cerebrovascular disease (438-)		—	1.8	8
Heart failure (4270)		—	1.7	10
Chronic obstructive pulmonary disease (492-)		—	1.6	11
Top 15 problems, cumulative percentage	43.2		39.3	
All other problems not in the top 15	56.8		60.7	
Total	100.0		100.0	

Dashes indicate that rank order of this problem is not in the top 15 reported in this type of teaching site
***Includes mostly cerebrovascular accidents*

model practice experiences are shown in Table 3. Although the age distribution of patients is similar in the two sites, more younger adults, aged 15 to 44 years, were seen in the model practices than in the private practices (55.5 vs 37.0 percent), and more older adults, aged 45 years and over, were seen in the private sites (44.1 vs 28.4 percent). Model practices had slightly higher proportions of female patients and lower proportions of white patients than private practices. Nonwhite patients in both sites were, with few exceptions, black, reflecting racial distribution in the southeastern region of the United States.

The types of patient problems seen by students are compared between teaching sites in Table 4 and Table 5. In Table 4, problems are grouped by the 18 major ICHPPC categories and ranked according to frequency of problem contacts. The experience was very much alike in the two sites, with circulatory problems, signs and symptoms, respiratory problems, and supplementary classification problems recorded most often.

The 15 most frequent individual problems in each site are compared in Table 5. Eleven of the top 15 are shared by both sites, the most frequent being medical examination with no disease detected, uncomplicated hypertension, and acute upper respiratory tract infection. Some problems, such as prenatal care and os-

teoarthritis, were reported more often in model than in private practices, while other problems, such as chronic ischemic heart disease and cerebrovascular disease, were more frequent in private than model practices. The top 15 problems accounted for 43.2 percent of the total experience in model sites and 39.3 percent in private sites. Of the 371 different ICHPPC problem rubrics, 233 were recorded in the model practices and 307 in private practices, indicating a broad spectrum of clinical experience in both sites, but broader in private than in model practices.

DISCUSSION

The Duke student clinical experience data show that the model family practices do reflect private practice with regard to patient demography and problem mix. Volume of patient encounters and the proportions of hospitalized and older adult patients are less in model than in private settings. The physician's office is the principal teaching site in both locations with little time in homes and nursing homes. Because only one month was spent in each site, there was limited opportunity for the same patient to be seen repeatedly by the same student unless the patient happened to be hospitalized.

The patient problem spectrum in the model and private practices is very much alike. Eleven problems are in the top 15 most frequent in both sites. Most of the problems that were not shared by the two sites in the top 15 were ranked in the top 25. For example, osteoarthritis, the 6th most frequent in model practices, was ranked 18th in private sites, and prenatal care, which was 4th in model practices, was 21st in private sites. Likewise certain problems that ranked in the top 15 in private practices were somewhat less frequent in model sites. Thus, heart failure was ranked 17th, chronic obstructive pulmonary disease, 18th, and chronic ischemic heart disease, 25th in model practices. The higher proportion of younger adults in model practices may account for the higher incidence of vaginitis, whereas the higher proportion of older adults in private practices may explain the higher reporting of cerebrovascular disease.

Experience in both sites is a reflection of the ambulatory clinical experience reported by office-based US physicians in the 1981 National Ambulatory Medical Care Survey (NAMCS).[4] The sex and age distribution of patients is similar. (NAMCS patients were 60.4 percent female, 18.3 percent were aged under 15 years, 13.5 percent 15 to 24 years, 26.6 percent 25 to 44 years, 23.3 percent 45 to 64 years, and 18.4 percent 65 years and over.) The three most common patient problem categories for office-based physicians (supplementary classification, respiratory problems, and circulatory problems) accounted for 39.7 percent of all problems. These same problems accounted for 38.5 percent of the experience in model practices and 36.7 percent in private practices. Hypertension, the single most common problem seen by US office-based physicians (4.9 percent of office visits), was also the most frequent problem recorded by Duke students in the private sites (6.9 percent) and second most frequent in the model sites (5.7 percent).

Clinical experience in both sites is similar to that reported in previous studies performed exclusively in family practice sites. For example, in the 1975 to 1978 North Carolina preceptorship study[5] (which compared experience of medical students with that of residents and practicing physicians in the 1973 to 1975 Virginia study[6]), the three most common patient problem categories were the same as described above for the present study, accounting for a similar proportion of total experience (39.6 percent compared with 38.5 percent for model and 36.7 for private sites). Hypertension was the second most common problem reported in the Virginia study and third in the North Carolina study.

Comparison with the WAMI (Washington, Alaska, Montana, Idaho) study,[7] in which students were the data collectors during a family medicine clerkship, reveals similarities with regard to the volume of clinical experience. There, 166 students reported a mean of 268 diagnostic encounters each (range 179 to 341) for a six-week period spent entirely in community practices. This figure compares with the 346 problem contacts per student per one month in private sites reported in the present study. In either case, it is apparent that the volume of student experience is large in community family practice sites.

Patient volume stands out as the major difference between model and practice sites in the present study. While the volume for students in model practices will vary among sponsoring institutions, certain factors operate to keep the volume lower than in practice sites. Model practices are more education oriented because of their medical center faculty and housestaff teachers, larger proportion of didactic teaching time, and larger numbers of learners, whereas private practices are more service oriented because of their full-time practicing physician teachers, absence of housestaff, limited didactic time, and few formal learners.

From an educator's viewpoint, student experience in model practices can be structured and controlled more readily than that in private practices, where numerous factors relating to differences among patients, sites, and preceptors complicate standardization of educational experience. The tradeoff for the more controlled environment of the institutional model practice is the real-world exposure offered by the private practice. The format of the Duke family medicine clerkship, which provides one month in each site, strikes a balance between the two types. The combination of teaching sites provides medical students ample opportunity for clinical experience with a broad range of ambulatory patients and problems while they interact with a variety of family physician role models.

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References

1. Parkerson GR Jr, Muhlbaier LH, Falcone JC: A comparison of students' clinical experience in family medicine and traditional clerkships. J Med Educ 1984; 59:124-130
2. Parkerson GR Jr: An improved encounter card for documentation of clinical experience. J Fam Pract 1980; 11:645-646
3. International Classification of Health Problems in Primary Care. Chicago, American Hospital Association, 1975
4. Lawrence L, McLemore T: 1981 Summary: National Ambulatory Medical Care Survey. National Center for Health Statistics (Hyattsville, Md): Advance Data from Vital and Health Statistics, No. 88. DHHS publication No. (PHS) 83-1250. Government Printing Office, 1983
5. Parkerson GR Jr, Baker C: Clinical experience of medical students in North Carolina family medicine preceptorships. J Med Educ 1980; 55:42-47
6. Marsland DW, Wood M, Mayo F: Data bank for patient care, curriculum, and research in family practice: 526,196 patient problems. J Fam Pract 1976; 3:25-28
7. Phillips WR, Rosenblatt RA, Gordon MJ, Fletcher RM: Clinical content of the WAMI community clerkship in family medicine. J Med Educ 1982; 57:615-620