Growth and Maturation of a Model Family Practice: A Five-Year Prospective Study

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New medical practices go through a process of growth and maturation. In this study, a newly established model family practice was examined prospectively in order to describe the changes in the patient population and utilization patterns as the practice developed. Cross sections of the registered patient population were sampled randomly after the first and the sixth year of practice operation, and the results were analyzed.

As part of the analysis, the population using the practice was examined from three points of view: those who were registered with the practice, those actually using the practice during the sample periods, and those using the practice "out-of-hours."

During the five-year study period, practice volume tripled and the operation began to approach financial self-sufficiency. The characteristics of the patient population using the clinic changed markedly. The mean patient age increased, the number of welfare patients decreased, and the clinic population grew to resemble more closely the demographic profile of the surrounding area. The study proved to be very useful as a tool for examining the structure of this model family practice and evaluating the educational relevance of the patient population to the needs of the residents.

Medical practices grow and mature; as dynamic social organisms, they go through the stages of birth, maturation, and death that characterize living entities. An understanding of the pattern and process of this growth is useful both for teaching and administrative purposes, particularly for fam-

ily practice residency programs. Previous work has focused on the economic growth of practices as they expand[1] and the spectrum of morbidity seen.[2,3] Anecdotal evidence suggests that the composition of the patient population changes with time and that there is a process of accommodation by which the physicians in the practice and the patients served select one another and establish a mutually agreed upon pattern of interaction. The purpose of this paper is to explore prospectively the changes that occur in the patient population of one newly established group family practice in a residency program over a five-year period and to describe the maturation and growth of that

practice. The study was designed to develop some useful methodological tools with which to describe the changes that occur in growing practices and to describe qualitatively the characteristics of a fairly typical residency based group practice over time.

The Family Medical Center of the University of Washington was established in July 1972. A group practice was created composed of residents in training and their faculty instructors. The practice was designed on a traditional fee-for-service model, and no specific criteria for patient eligibility were established. Although set in the University Hospital complex, the clinic maintained its physical and organizational autonomy from the pre-existing hospital outpatient clinics. New patients are referred from other specialty clinics in the university, from physicians and agencies in the community, and through word of mouth from existing patients, with the last channel the predominant source of new patients.

The model family practice sought to deliver comprehensive care and emphasized continuity of care as far as possible, given the constraints of a training program. Patients requiring admission were hospitalized primarily in the University Hospital and were taken care of by the family physicians and university based consultants. Subsequently, an independent family medicine service was established and an active obstetrical practice was initiated. A 24-hour on-call system was established through which residents and faculty in rotation were continuously available to patients. All patients needing to be seen during unscheduled hours were cared for by practice members.[4]

The practice has grown in a linear fashion, and currently the 18 residents and 12 full-time faculty manage approximately 18,000 patient visits per year, although faculty involvement in the practice is quite variable. From a conceptual standpoint, a practice can be seen as composed of a number of different patient cross sections, each of which is a subset of the universe of patients who have access to the practice. In an urban area such as Seattle, it is impossible to precisely define the target population, since patients are free to use multiple sources of health services. There is a difference, however, between the registered population within the practice—those patients who at some time come into contact with the practice and have a medical chart created—and an active population of patients who visit the practice and account for the

actual day-to-day work load. In addition, there is another cross section of the population which utilizes the practice outside scheduled hours. One purpose of this study is to examine the growth and utilization of the practice from the perspective of these different subsets of the registered population.

Methods

The following definitions were used in the conduct of this study:

Registered Active Patient—A patient who has had at least one contact with the practice and belongs to a family/household with a member who has received services from the practice at least once in the previous two-year period.[5]

Visiting Patient—A registered patient who was seen during scheduled hours during the study period.

Out-of-Hours Patient—A registered patient who had telephone contact or was seen in the practice or in the emergency room outside scheduled hours during the study period.

Samples of registered patients, visiting patients, and out-of-hours patients were collected during the summers of 1973 and 1978 after one year and six years, respectively, of practice operation. The sample of registered patients was collected from the patient registry during the midpoint of each of the study periods. Visiting patients included all patients seen during scheduled hours in the family medical center from the period June 1 through July 16 in 1973 and 1978, respectively. The out-of-hours sample was created by maintaining a log of all telephone contacts or patient visits managed by the residents outside scheduled hours during the months of July and August during the two study years.

Random samples of the three practice cross sections were drawn for the two study periods. Table 1 illustrates the size of the various sample universes and the proportion of each which comprised the actual data analyzed for this study.

When the samples were compiled, the charts for the patients selected were located and abstracted. Data were captured about the demographic characteristics of the patients, including insurance

Table 1. Proportions of Patient Cross-Sectional Populations Sampled					
	1973			1978		
	Size of Sample Universe	Size of Random Sample	Percent of Universe Sampled	Size of Sample Universe	Size of Random Sample	Percent of Universe Sampled
Registered population	2,260	113	5	6,550	262	4
Number of visits during study period (45 days)	940	94	10	1,980	198	10
Number of night calls during study period (2 months)	266	47	5	382	76	5

status, family composition, and place of residence. In addition, information about number of recent visits and number of active problems was recorded. The data were analyzed using the *Statistical Package for the Social Sciences*.[6]

Results

Practice Growth

The practice grew steadily throughout the five-year study interval. After one year of practice, there were 2,260 registered patients generating 7,164 patient visits and 1,596 after-hours calls per year; five years later, 6,550 registered patients were generating 15,372 scheduled visits and 2,292 after-hours calls per year. Although there was some increase in the number of full-time equivalent physicians in the clinic during the period and the clinic was remodeled to increase the efficiency of patient flow, the staffing configuration in the clinic during the five-year period was relatively

stable. The clinic was planned to accommodate 18,000 patient visits a year at maturity, and thus the 1978 sample indicates that the practice had almost achieved its initial productivity goal. During 1978, the practice began to approach a certain measure of financial self-sufficiency for the first time, with income generated from patient visits covering direct and indirect operating expenses, excluding faculty and resident salaries.

The Changing Demography of the Visiting Population

Ambulatory practices focus their energies on those patients who are seen during scheduled appointments, the visiting patient sample in this study. Table 2 depicts the changes in the visiting patient sample between the two study periods. It is evident from this table that the characteristics of the population receiving care at the family medical center during scheduled appointments has changed since the practice's inception. The patients currently are significantly older than they were when the practice was new, an observation paralleled by an increase in the number of patients

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Patient Characteristics	Year 1973	Year 1978	x² (d.f.)	Statistical Significance Level
Percent female	65.2	70.6	.83(1)	NS
Percent Caucasian	83	85	.33(1)	NS
Percent member of nuclear family	40.2	32.1	1.8 (1)	NS
Percent member of single parent family	7.6	16.6	5.4 (1)	P<.05
Percent Medicaid/Welfare	38.5	23.9	6.52(1)	P<.01
Percent Medicare	5.5	11.2	2.36(1)	NS
Percent living in same or adjacent zip code as clinic	42.4	41.5	.02(1)	NS
Age	26.3 ±19.8	37.5 ±23.0	T-test t=4.02	P<.001

Table 2. Demographic Composition of Visiting Patient Population, 1973 and 1978

who are covered by Medicare. At the same time, the socioeconomic composition of the visiting population has changed, with significantly more of the patients in the full-pay category and fewer of the patients covered by Medicaid. The number of single-parent families—families with dependent children in which the parent is either unmarried, separated, divorced, or widowed—has more than doubled.

At the same time, some important patient characteristics have not changed. The place of residence of the patients served has remained stable, with about half the patients living within the neighborhoods surrounding the university and 75 percent easily accessible to the university by public and private transportation. The racial composition of the patient population has changed little. And despite the increase in the number of single parents and their children in the practice, the largest patient group belongs to traditional nuclear families in which married parents and their children live in the same household.

Comparisons of the Different Practice Cross Sections

An active medical practice is multidimensional; it provides direct scheduled medical services and emergency care and acts as a source of information and security for a group of clients who may otherwise rarely use its services. By examining the composition of the patient population from different vantage points—defined by the way the patients utilize the practice—it is possible to speculate about which familial and personal attributes determine the way different people use different medical services.

Table 3 presents the differing composition of the three cross sections as reflected in the 1978 data. It is immediately apparent that there are differences between those patients who actually used the clinic during the study period and those who are members of the registered population but may not be regular clinic users. The visiting group is more likely to be older, female, and have more active problems listed in their problem list than the

Patient Characteristics	Table 3. Comparison of Registered, Visiting, and Out-of-Hours Patients, 1978 Practice Cross Section				
Patient Characteristics	Registered Patients	Visiting Patients	Out-of-Hours Patients	x^2 (d.f.)	Statistical Significance Level
Percent female	57.4	70.6	79.7	16.2(2)	P<.001
Percent Caucasian	90	85	82	4.1(2)	NS
Percent member of nuclear family	49.2	32.1	47.3	13.6(2)	P<.01
Percent member of single parent family	14.0	16.6	32.5	13.6(2)	P<.01
Percent Medicaid/ Welfare	22.9	23.9	48.0	20.09(2)	P<.001
Percent Medicare	6.2	11.2	6.7	3.94(2)	NS
Percent living in same or adjacent zip code as practice	41.1	41.5	43.2	16.2(8)	NS
Number of active problems in problem list	2.6	4.2	3.6	32.5(28)	P<.02
Age	28.7±20.0	37.5±23.0	27.5±20.0	F(analysis of variance) 11.54	P<.005

registered group. Table 4 further displays the differences in the age structure of the three cross sections of the practice population and compares this breakdown with the age profile for King County, where 75 percent of the patients live. Although in each patient category the young adult age group predominates, patients over 44 years comprise 36 percent of the visiting patient sample, more than twice their representation in the registered population. The age composition of those patients in the visiting sample in 1978 closely resembles the age structure of the county at large, which is a marked change from the situation prevailing in 1973.

The group who use night call also differ demographically from those who comprise the registered and visiting population groups. Eighty percent of those calling out of scheduled hours are women, 47 percent are supported by public assistance, and 32 percent are single parents with children at home. These segments of the practice make disproportionate use of the telephone as a way of obtaining medical services.

Discussion

The model family practice center has been established as the teaching base of family medicine residencies in the United States.[7] Designed to represent actual practice conditions, the model practice ideally allows the resident to confront and master the challenge of providing comprehensive medical care to a representative patient population. Moreover, the income derived from the pro-

	Table 4. Age Profile of Practice Cross Sections, 1978, and of King County, 1980 (Projected)							
	Registered Patients		Visiting Patients		Night-Call Patients		King County 1980 Population Projection*	
Age Range	N	%	N	%	N	%	Age Range	Percent of Population
0-16	73	28	28	14	19	25	0-14	21.2
17-44	142	54	99	50	43	58	15-44	47.8
45-64	25	10	42	21	9	12	45-64	20.7
65 or over	22	8	29	15	4	5	65 or over	10.4
Total	262	100	198	100	75	100		

*The source for the population projection came from Population Enrollment and Economic Studies Division: Washington State County Population Forecasts by Age and Sex: 1970-2005. Olympia, Wash, Office of Financial Management, December 1977

vision of services by residents and faculty working in this group practice constitutes a significant component of the support for postgraduate training in family medicine.[8]

Since almost all the model practices must go through the process of building a patient population for whom they provide care, it is useful to understand something about the growth and development of new model family practices. In this residency program, the information gathered permitted some realistic assessment of the suitability of the practice population as a true "model" of community family practice.

The ecological perspective proved to be a useful tool with which to examine this practice.[9] In the traditional fee-for-service system which determines the basic structure of most medical practice in the United States, there is no predetermined population for which a specific practice is responsible. In the typical case, that group of patients which actively utilizes a practice is a subset of a larger group of patients who might use that practice under certain circumstances. By the same token, any given patient may simultaneously seek medical services from multiple sources. In this study, the authors have sought to define the relationship among three overlapping and arbitrary, but conceptually useful, ways of defining the users

of the practice: those who have registered with the practice at some time, have medical charts available, and are theoretically patients of the practice; those who during the study period actually used the practice during scheduled office hours; and those who utilized the practice by calling for assistance during unscheduled hours. This study allowed the authors to test their belief that there are differences in the demographic composition of various subsegments of the practice as defined by their relationship to the practice and the way they use its services.

The practice changed markedly over time. The practice grew dramatically and, at the end of the sixth year of operation, the total patient volume was very close to that planned when the clinic was initially designed. At the same time, the composition of the patients using the population grew older, the proportion of active patients who were supported by public assistance diminished, and the patient composition became more similar demographically to the population of the county from which the practice draws most of its patients. Early in the practice, a greater proportion of the practice was young and poor, perhaps because this group has difficulty obtaining access to medical care or perhaps because many of the early patients were referred by other hospital clinics or commu-

nity agencies. The rising socioeconomic status of the practice population may reflect the increasing acceptance of this mode of care by middle class residents of the service area. It may also be a product of the establishment by the center of subtle barriers to use by lower socioeconomic groups, although no formal barriers were erected.

Also with time the disparity between the different cross-sectional segments of the patient population was heightened. The proportion of older patients, predominantly female, using the practice on a scheduled basis increased, approximating the national experience that women and the elderly utilize a disproportionate amount of ambulatory medical care.[10]

At the same time, a large proportion of the night calls—characteristically one of the most difficult components of a family practice—were generated by those on welfare and by single parents, demographic characteristics which are highly associated in this practice. Previous studies have demonstrated the apparent overutilization of night-call and emergency services by welfare patients and have tended to attribute this to the absence of financial constraints.[11] An important factor might be that many of these patients are largely single parents, a group with heavy responsibilities for child care and few social or economic resources to buffer the anxiety produced by an unexpected illness. This segment of the population is at particularly high risk for needing medical care on an unscheduled basis and might be amenable to some patient education efforts designed to increase their resources to cope with unexpected illness. Scheduling clinic hours during evenings and weekends would also help.

In summary, this is a case study of the growth and evolution of a new model family practice established in a family medicine residency. The study presents techniques of practice analysis that yield increased insight into the composition of the population which utilizes the practice. Maintaining demographic information on the registered population in a practice gives only a partial insight into practice composition. Looking further at those segments of the population that utilize the practice facilities during scheduled appointment periods and those who use the practice outside scheduled hours gives a much more complete picture of practice dynamics. This study showed that there are significant differences in the demographic pro-

file of the groups of patients who use the practice in these different ways.

Analyzing the changes in these population segments over time adds an additional valuable perspective. By following the changes in the visiting population over a five-year period, the authors observed that the patient population using the center grew to resemble demographically the population characteristics of the geographic area the center was trying to serve. This was reassuring from an educational point of view, since it supported the desire to provide residents with a clinic population that was representative of the larger community. It would be valuable to replicate a study such as this in other organizational and geographic settings to determine whether the pace and nature of practice growth is similar in other areas.

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