

# Utilization and Cost Effectiveness of a Family Practice Center

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In a prepaid group practice setting, a group of 45 Family Practice Center patients, carefully matched by age, sex, and employment, were compared with a group of 63 patients attending medical and pediatric clinics. Utilization rates for physician and nonphysician visits and costs of laboratory and x-ray services during a period of 33 months were examined.

Despite a 25 percent greater prevalence of significant chronic medical problems, the family practice group used specialist care less than one half as much as did the matching group and made one extra physician visit per patient per year. Costs for laboratory and x-ray procedures did not differ significantly. Satisfaction expressed in responses to telephone interviews of both groups was found to be somewhat greater among the family practice patients.

The findings of this study provide some support for greater cost effectiveness and patient satisfaction of family practice compared with alternative modes of primary care.

Recent follow-up studies of family practice residency graduates suggest that they are locating in areas of need as part of a continuing trend toward providing comprehensive medical care to the families served.<sup>1-7</sup> Concomitant with this resurgence is a trend for a substantial segment of primary medical care in the United States to return to family practice settings. In the midst of escalating medi-

cal expenditures, questions of cost effectiveness and patient satisfaction arise.<sup>8,9</sup>

Family practice advocates respond to spiraling medical care costs by asserting that their discipline is more cost effective than alternative modes of primary medical care. It is argued that family physicians restrain costs by providing continuity of care for all family members, by rendering definitive care for most problems presented by ambulatory patients and by ordering diagnostic laboratory and radiology studies less frequently. This pattern of use of diagnostic studies was described in a recent survey comparing ambulatory care rendered by internists and family/general practitioners.<sup>9</sup> It is further argued that because of the completeness of care rendered and the ready accessibility of family physicians to their patients, costly referrals to specialists are less often needed. Further, multiple

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This paper was presented at the 33rd Annual Scientific Assembly, American Academy of Family Physicians, September 23, 1981, Las Vegas, Nevada. From the Department of Family Practice, Kaiser-Permanente Medical Center, and the School of Public Health, University of Hawaii, Honolulu, Hawaii. Requests for reprints should be addressed to Dr. Donald L. Farrell, Department of Family Practice, Kaiser-Permanente Medical Center, 1697 Ala Moana Boulevard, Honolulu, HI 96815.

0094-3509/82/050957-06\$01.50  
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problems are commonly addressed at a single visit, and several family members may be seen at the same visit to the physician. These suppositions have yet to be validated by controlled studies.<sup>10,11</sup>

### The Study and Its Setting

The existence of a Family Practice Center within the prepaid group practice setting at Kaiser-Permanente Medical Center in Honolulu, Hawaii, during the last few years has created an opportunity to examine questions such as these in carefully matched groups of patients who were completely free to choose among different modes of primary care offered in the same building.

The medical center is the central facility in Honolulu for the Kaiser-Permanente Medical Care Program, a health maintenance organization (HMO) that features prepaid multispecialty group practice providing comprehensive care. Plan membership on Oahu is approximately 105,000, of whom approximately 57,000 receive primary care in the clinics based at the main hospital. The multiethnic population served includes a balanced spectrum of ages, sexes, socioeconomic status, and medical problems.

Within this environment, the Family Practice Center serves a panel of plan members who enroll as family units. The Family Practice Center aims to provide them with complete and continuing care. Approximately 5,000 members were enrolled at the center during the project period. Staffing at the center consisted of three to nine family practice residents and one to three attending faculty-clinicians, each of whom divided their time by approximately 50 percent between teaching and direct patient care. Over 50 percent of Family Practice Center visits were to residents.

Alternative primary care services in the same building include internal medicine and pediatric clinics, staffed largely by board-certified physicians. Fewer than 10 percent of visits to these clinics were staffed by residents. Health plan members have complete freedom in choice of clinic and physician.

Available at the same medical center were clinics for obstetrics and gynecology, general surgery,

and nearly all medical and surgical specialties. Also available were laboratory and x-ray facilities, as well as a full range of ancillary services.

The following hypothesis was tested: People who obtain their primary medical care from the Family Practice Center do not differ from patients who obtain their primary care in other clinics of the facility with regard to cost effectiveness or satisfaction with their care.

### Methods

After the research plan was approved by the medical center's research committee, two matched groups were identified using a computer program from the Pacific Health Research Institute: (1) families receiving their primary care at the Family Practice Center; and (2) a matching group of families receiving primary care from pediatric or general medical clinics housed in the same building and sharing the same transportation and parking challenges, the same ancillary services, and the same specialty support.

A "family" was defined as a Kaiser Foundation Health Plan Hawaii Region subscriber (responsible party) and all his or her dependents who were covered under that medical care contract. The families were matched for age and sex of each family member, family size, employer number of responsible party, and health plan membership of more than one year. Because medical care utilization is affected not only by the patient's social and demographic characteristics but also by the frequency and severity of medical problems, it was also necessary to match the groups for medical factors. The medical records for these people were given in random order to a third-year internal medicine resident, who without knowing the nature of the study, checked the completeness of the problem list found in the front of the patient record. He examined progress notes, operative notes, and laboratory and radiology reports for the past few years to construct his own version of the problem list. In addition, he noted the employment and ethnicity of each patient.

The medical record numbers of presumably matched patients were submitted to the health

Table 1. Distribution of Significant Medical Problems (Number of Problems per Patient) Among Family Practice Vs Matching Patients, July 1978—March 1981		
Medical Problem*	Family Practice Group	Matching Group
Infections	.02	.06
Neoplasms	.03	.05
Metabolic (including obesity)	.22	.15
Anemia	.02	.02
Psychiatric	.10	.03
Eye, ear, nose, throat	.07	.03
Cardiovascular	.43	.19
Respiratory	.17	.11
Gastrointestinal	.09	.13
Hernia	.03	.06
Genitourinary	.22	.25
Skin	.19	.18
Musculoskeletal	.24	.18
Injuries	.08	.12
Allergy	.07	.06
Total problems per patient	2.00	1.60

\*Sequence follows International Classification of Health Problems in Primary Care (ICHPCC)

plan computer facility to obtain all office visits and ancillary services for each patient at any health plan facility from July 1, 1978, through March 31, 1981 (11 calendar quarters).

A randomly selected sample of families from each group (24 from the Family Practice Center and 23 from the matching group) were sent a letter, then telephoned by a nurse, requesting permission to make an appointment for a 10- to 15-minute telephone interview surveying member satisfaction with services. These interviews were conducted by a health plan employee instructed to perform a membership sampling survey, not knowing that it was a comparative study.

As a result of examining the medical records in preparation for the medical problem list review and the telephone survey, several families were removed from the study because they had moved to a suburban clinic or off the island or because their matching family had done so. A perusal of the office visit list revealed other families who had

to be removed for the same reasons. The final sample contained 45 Family Practice Center patients and 63 matching patients.

## Results

The Family Practice Center and matching groups shared a varied and approximately equivalent ethnic distribution.

Table 1 compares the distribution of medical problems in the two matched groups. There was a 25 percent greater prevalence of chronic problems (obesity, hypertension, asthma, and psychiatric conditions) in the Family Practice Center group (2.0 problems per patient) than in the matching group (1.6 problems per patient). These utilization data must be viewed from the perspective that pa-

**Table 2. Number and Rate per Patient-Year of Clinic Visits for Family Practice Center (FPC) and Matching Groups by Type of Visit, July 1978—March 1981**

Patients Age (yr)/Group	FPC No. (%)	Pediatric/Medical No. (%)	Emergency No. (%)	Total Primary Physician No. (%)	Specialty Physician Visits No. (%)	Total Physician Vists No. (%)	Nonphysician Provider Visits** No. (%)
Male and female (<15)*							
FPC (n=11)	58 (2.0)	4	13 (0.4)	75 (2.6)	10 (0.4)	85 (2.9)	0
Matching (n=17)	2	86 (1.9)	8 (0.2)	111 (2.4)	14 (0.3)	125 (2.8)	10
Male (15-44)							
FPC (n=8)	55 (2.5)	4	13 (0.6)	72 (3.3)	14 (0.6)	86 (3.9)	6
Matching (n=10)	0	35 (1.3)	5 (0.2)	58 (2.1)	47 (1.7)	105 (3.8)	20
Female (15-44)							
FPC (n=8)	110 (5.0) [3.9]	2	7 (0.3)	119 (5.4) [4.3]	18 (0.8)	137 (6.2) [4.7]	14
Matching (n=10)	0	35 (1.3)	13 (0.5)	54 (2.0)	44 (1.6)	98 (3.6)	15
Male (45+)							
FPC (n=10)	136 (4.9)	4	7 (0.3)	147 (5.3)	28 (1.0)	175 (6.4)	13
Matching (n=14)	0	97 (2.5)	8 (0.2)	110 (2.9)	118 (3.1)	228 (5.9)	49
Female (45+)							
FPC (n=8)	116 (5.3)	4	2 (0.1)	127 (5.8)	44 (2.0)	171 (7.8)	10
Matching (n=12)	1	83 (2.5)	14 (0.4)	101 (3.1)	94 (2.8)	198 (5.9)	58
Total clinic visits							
FPC (n=45)	475 (3.8) [3.6]	16 (0.1)	42 (0.3)	540 (4.4) [4.2]	114 (0.9) [0.8]	654 (5.3) [5.0]	43 (0.3)
Matching (n=63)	3	336 (1.9)	48 (0.3)	434 (2.5)	317 (1.8)	751 (4.3)	152 (0.9)

Note: Rates (in brackets) adjusted for unmatched obstetric visits  
 \*Utilization rates adjusted for shorter observation of infants born after June, 1978  
 \*\*Includes Acme Clinic, Audiometry, Dietary Counseling, Optometry, Multiphasic Screening, Physical Therapy, and Maternal Health

tients were probably self-selected into an environment designed for long-term supportive care.

Table 2 compares the distribution of clinic visits for children under 15 years, adult male patients, and adult female patients and gives total visits for all patients. Overall, there was no notable cross-over between the two modes of receiving primary care during the 2.75 years of observation. A negligible number of Family Practice Center patients went to pediatrics or general medicine clinics, and the reverse was true for the matching group. This sharp division was to some degree a by-product of the Family Practice Center's policy of requesting that all primary care visits be directed to the center in order to avoid self-referral to specialty clinics.

With the exception of two categories of pa-

tients, several common patterns of utilization were demonstrated. As shown in Table 2, the family practice group visited specialists only about one half as often as the matching group (0.9 visits per patient-year vs 1.8 visits per patient-year). The family practice group visited nonphysician providers only one third as often as the matching group (0.3 visits per patient-year vs 0.9 visits per patient-year). On the other hand, Family Practice Center patients had one more physician visit per year than the matching group (5.3 visits per patient-year compared with 4.3 visits per patient-year).

Office visit rates for the Family Practice Center women aged 15 to 44 years included two pregnancies; none occurred in the matching group. The

visit rates corrected by deletion of the two women are shown in brackets in Table 2. The effect of this correction is to bring the overall Family Practice Center visit rate down from 1.0 to 0.7 more than in the matching group.

Women of this age also presented one of the two exceptions to the general trends. Their visit rates to nonphysician providers were similar for the Family Practice Center and matching groups (14 and 15 visits per year, respectively), whereas primary and specialist physician visit rates conformed to general trends.

The other deviation from the overall trends occurred among pediatric patients under age 15 years (Table 2). For them, visit rates to primary physicians and specialists did not differ between the two groups studied (2.0 visits per patient-year for Family Practice Center patients and 1.9 visits per patient-year for matching patients). But the greater visits rate to nonphysician providers by the matching group was even higher here (ten yearly visits by the matching group compared with none for Family Practice Center patients).

Data concerning costs of laboratory and radiology services are given in Table 3. No significant cost differences were found between the two groups. Urinalyses were excluded because some were done at the Family Practice Center without entry into the health plan data system.

The telephone survey of the two groups showed overall satisfaction with the health plan system, although the family practice group was somewhat more satisfied in certain parameters such as greater accessibility, as indicated by less appointment delay and less visit waiting time. Family physicians were rated superior in communication skills; they offered more health advice and were judged better at knowing their patients as persons. The family practice group received more medications; understanding and compliance in the use of medications were similar.

## Discussion

The methods employed in this study resulted in a built-in bias against cost effectiveness of the Family Practice Center group for three reasons.

**Table 3. Cost (\$) for Clinical Laboratory and Radiology Services per Patient-Year in Family Practice Center (FPC) and Matching Groups, July 1978—March 1981**

Group	Laboratory*	Radiology
FPC	29	41
Matching	27	48
*Urinalysis excluded		

First, the family practice patients were selected from a file of health plan members drawn from an office visit list and thus were high utilizers, whereas the matching group were chosen at random from the general health plan membership file, which combined both high and low utilizers. Because the health plan membership file does not indicate the source of usual primary care, the family practice group could not be selected from it.

Second, the family practice group appeared to be sicker and therefore in greater need of physician visits and diagnostic tests. Third, compared with the matching group, the family practice group received their care from less-experienced physicians. Residents (in their first through third years of training) provided over one half of the ambulatory care received by the family practice group, compared with less than 10 percent by the matching group. Residents may have tended to request more diagnostic studies and consultations than fully trained and experienced physicians. Furthermore, residents were taught diagnostic and management techniques, not only by their family practice preceptors, but by the same specialists from the other clinics with whom they were compared, and their ordering habits were found to follow similar patterns.

Within these limitations, the data in this study show the following:

1. Given free choice within the same health care system, it appeared that patients with chronic medical problems tended to select care at the Family Practice Center. This may be a bias of the "family" matching technique.

2. The matching group had more than double the rate of specialty care than the family practice group. This was partially balanced in the family

medicine group by the cost of visiting a physician one extra time per year. This represents a cost saving, since specialty care is more expensive. In the Hawaii Region, Kaiser-Permanente health plan specialists are compensated at an average salary 20 percent greater than primary care physicians.

3. The matching group also had triple the usage rate of nonphysician provider services. Many of these services, such as dietary counseling, acne care, maternity care, and health examinations, are routinely given by family physicians as an integral part of their daily practice. The higher use of these services by the matching group may reflect their need for more supportive person-to-person contacts.

4. Costs of laboratory and radiology tests were about the same in both groups. This finding is in contrast to that of the National Ambulatory Medical Care Survey,<sup>9</sup> which showed that internists used laboratory tests in 73 percent and x-ray examinations in 53 percent of visits compared with 34 percent and 19 percent, respectively, for general practitioners. Reasons for the ordering patterns demonstrated in this study are suggested above.

5. Patient satisfaction and understanding measured by the telephone survey were found to be somewhat greater in the family practice group, but were generally high in both. Family physicians led in accessibility and communication skills. They offered more health advice, another finding at variance with that of the National Ambulatory Medical Care Survey,<sup>9</sup> which determined that internists offered more health advice.

## Conclusions

The data in this study provide some support for the hypothesis that family practice is more cost effective than other modes of primary care. The key finding is that within the environment studied, expensive specialty care was used by the Family Practice Center patients less than half as often as by the patients of the alternative primary care clinics. Even though family physicians generated about 0.7 more physician visits per patient per year, this was offset by fewer visits to specialists and nonphysicians.

A technique has been demonstrated that, with appropriate modifications, may be used by others to elucidate the important and controversial questions about cost effectiveness and desirability of family practice. It is hoped that other investigators will examine these questions in carefully controlled studies. Prepaid group practice systems are ideal sites for this research, since similar studies in the fee-for-service sector are difficult to conduct. Such data from either source would be of great interest and benefit to physicians, educators, and health planners alike.

## Acknowledgment

This paper was supported in part by a grant from the Pacific Health Research Institute, Honolulu, Hawaii.

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