

Gatekeeping in Primary Care: A Comparison of Internal Medicine and Family Practice

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Five hundred twenty new patients were randomly and prospectively assigned to receive their care in the Internal Medicine Clinic or Family Practice Clinic of a large university hospital. The patients were followed by residents in training under the supervision of board-certified internists or family physicians. After a mean length of care of slightly over two years, the charts were reviewed for frequency of visits to primary care providers (internal medicine or family practice), Emergency Room, Acute Care Clinic, and all clinics other than the two primary care clinics. The records were also reviewed for laboratory tests ordered. Frequency of visits to the clinic of primary care, Emergency Room, Acute Care Clinic, and broken appointments were all significantly higher for patients randomized to the Internal Medicine Clinic. In addition, the median total annual cost of laboratory tests for patients followed by internal medicine physicians was significantly higher, largely because of higher laboratory charges generated by the specialist consultants. Over the study period, internal medicine patients had a significantly higher number of visits to all nonprimary care clinics and specifically to the dermatology, obstetrics and gynecology, and general surgery consultant clinics. It can be concluded that in this clinical environment, the practice styles of internal medicine and family practice are different.

In recent years there has been growing interest in comparing the practice styles of primary care physicians. Differences in the diagnostic methods of family physicians and internists have important implications for medical economics and the quality of care. These differences are especially germane to health care systems evolving in the 1980s, in which primary care physicians act as "gatekeepers" for patient access to appropriate consultant and laboratory services.

Previous studies have made use of programmed patients, written simulated clinical problems, and chart review of actual practices. Noren and associates¹ analyzed data from the National Ambulatory Medical Care Survey to compare general internists and family physicians-general practitioners. They found that internists spent more

time examining and instructing patients and also ordered more laboratory and x-ray studies. Smith and McWhinney² used patient actors to present programmed clinical problems to family physicians and internists. An analysis of the recorded interviews demonstrated that the family physicians asked fewer questions, used fewer items of physical diagnosis, and ordered fewer laboratory and related tests. Nonetheless, there was no significant differences in the final diagnosis reached by the two groups of physicians. Scherger and co-workers³ evaluated the diagnostic strategies of third-year residents in internal medicine and family practice. In response to written simulated ambulatory patients, the residents in the two specialties considered the same number and type of diagnostic hypotheses and did not significantly differ in total laboratory charges generated. Again, there was seen a greater tendency for internists to select more physical examination items.

Hamburger and others⁴ expanded upon data from the ambulatory setting by contrasting the treatment of diabetic ketoacidosis in a teaching hospital by internists and family physicians. The period of hospitalization was longer in the internal medicine group. In addition, the total number

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of laboratory and x-ray tests per patient and per hospital day was higher for internists, despite comparable serum and urine glucose levels at discharge.

It should be noted that the research methodologies described may bias the results. In programmed patients and simulated clinical problems, an artificial test environment may be created. Physicians tend to respond with answers reflecting the ideal rather than their actual practice behaviors.⁵ Other studies reviewing existing practices may be comparing patient populations that have been significantly skewed by self-selection.

A previous study⁶ attempted to eliminate this possible bias. A comparison of the laboratory ordering and referral requests of family practice and internal medicine trainees was made by randomly assigning new clinic patients to their respective clinics. The results, based on the 27 patients who were eventually seen in each clinic, were preliminary. A chi-square analysis of all the laboratory tests used in the family practice and internal medicine clinics failed to demonstrate any significant differences. Furthermore, the total cost for five months of ambulatory care by family physicians and internists was not significantly different. In view of these results, it seemed imperative to conduct a large-scale randomized study to further compare the care provided by trainees in internal medicine and family practice.

In the present study 520 patients were prospectively and randomly assigned to receive their care in the Internal Medicine Clinic or Family Practice Clinic of a large university hospital. The patients were followed by residents in training under the supervision of board-certified internists or family physicians. After a mean length of care of slightly over two years (maximum three years), the charts were retrospectively reviewed.

METHODS

Research Design

When patients called for new appointments at either the Internal Medicine Clinic or Family Practice Clinic at the University of California, Davis Medical Center (UCDMC), they were asked whether they had a preference for primary care provider. If the patients had not previously been seen in either clinic and expressed no preference between internal medicine or family practice, they were referred for consideration in the study. If the patients could be seen appropriately in either clinic, they were randomly assigned to receive care in one or the other. Patients were not excluded by type or severity of illness.

Approximately three years after the initial randomization, patient recruitment was discontinued, and the charts

were retrospectively reviewed for data that could be obtained without reading physicians' actual notes, to ensure against obtaining incorrect data resulting from incomplete or inaccurate documentation in the physicians' notes. These data included frequency of visits to primary care providers, Emergency Room, the Acute Care Clinic (a drop-in clinic run by the hospital for patients with non-life-threatening illnesses), and all clinics other than the two primary care clinics. The records were also reviewed for all laboratory tests ordered by any providers, as documented by actual test result reports. These records were separated into those ordered by the primary care providers and by all other providers. Laboratory tests included chemistry tests, x-ray examinations, and more elaborate investigations, such as biopsies and nerve conduction studies.

All data collected were analysed with chi-square, *t* test, or Wilcoxon rank-sum test.

The Study Setting

The curriculum of both the family practice and internal medicine residency programs follows the general requirements for all residency training programs and the special essentials for their branch of medicine. Within the Department of Internal Medicine, 12 out of 80 residents are in a "primary care" track, emphasizing ambulatory medicine. This number represents 15 percent of the participating providers in the Internal Medicine Clinic.

Referrals of patients to subspecialty clinics at UCDMC can be initiated only by a primary care physician. Patients are not able to self-refer to the subspecialties of their choice. There are no explicit policies or subtle pressures within internal medicine encouraging referral of patients to departmental subspecialty clinics for financial or educational purposes. Once a referral has been made, consultant physicians are able to authorize both laboratory services and admissions to the hospital.

There is a subtle difference in the manner in which family practice and internal medicine respond to acute or emergent situations. During regular clinic hours, both encourage patients to call or come into the clinic rather than going directly to the Emergency Room or Acute Care Clinic. After hours, family practice patients are advised to telephone the family practice resident on call regarding health questions or possible emergent visits to the medical center. Patients not telephoning in advance are seen by Emergency Room or the Acute Care Clinic staff. There is an internal medicine resident on call for the ward service; however, patients usually go directly to the Emergency Room or Acute Care Clinic for after-hours treatment.

TABLE 1. PERCENTAGE OF EMERGENCY ROOM VISITS, ACUTE CARE CLINIC VISITS, AND BROKEN PRIMARY CARE APPOINTMENTS OVER ENTIRE STUDY PERIOD

	None No. (%)	One No. (%)	Two or More No. (%)
Emergency Room visits*			
Internal medicine	137 (55)	55 (22)	57 (23)
Family practice	183 (68)	45 (17)	43 (16)
Acute Care Clinic visits*			
Internal medicine	142 (57)	37 (15)	70 (28)
Family practice	175 (65)	51 (19)	45 (17)
Broken primary care appointments*			
Internal medicine	87 (35)	86 (35)	76 (31)
Family practice	185 (68)	47 (17)	39 (14)

* $P < .01$, by chi-square

RESULTS

The mean length of follow-up was 2.1 years in each clinic. A total of 249 patients were followed in the Internal Medicine Clinic and 271 in the Family Practice Clinic. Mechanism of payment for both clinics was approximately 85 percent Medicare and public assistance, 10 percent private insurance, and 5 percent nonsponsored. The racial composition of the total patient population in internal medicine and family practice clinics was also equivalent with approximately 60 percent white, 20 percent Hispanic, 15 percent black, and 5 percent Asian. The mean patient ages in the present study were 42 years old in Internal Medicine Clinic and 40 years old in the Family Practice Clinic. There was no statistical difference when these were compared by t tests. Fifty-one percent of the patients seen in the Internal Medicine Clinic were female and 53 percent in the Family Practice Clinic were female. This distribution also was not significant when compared by chi-square test.

Frequency of visits to the Emergency Room and Acute Care Clinic and broken primary care appointments were compared for the two clinics and were all found to be significantly higher for patients followed by internal medicine than by family practice physicians (Wilcoxon rank-sum test, $P < .01$). In Table 1 these criteria have been condensed into major subgroups and their frequencies are presented. Each is significant by chi-square ($P < .01$).

Patients were seen on the average of 3.2 times per year in Internal Medicine Clinic and 2.6 times per year in Family Practice Clinic; this difference is statistically significant (t test, $P < .001$).

There are statistically significant differences in which specific laboratory tests were ordered by the two special-

TABLE 2. ANNUAL PER PATIENT COST (IN DOLLARS) OF LABORATORY TESTS

	Primary Care Ordered*		Consultant Specialist Ordered**		Total Ordered**	
	Mean	Median	Mean	Median	Mean	Median
Internal medicine	107	50	111	27	218	93
Family practice	97	34	96	0	193	64

* Not significant, $P = .15$ by Wilcoxon rank-sum test** Significant, $P < .01$ by Wilcoxon rank-sum test

ties, but this finding would be expected by chance when one compares approximately 200 different tests. An important summary variable is the difference in cost of laboratory tests ordered. The mean and median annual cost of laboratory tests ordered by the primary care provider, consultant-specialists (including the Emergency Room and Acute Care Clinic), and the total annual cost of laboratory tests are presented in Table 2. Because these costs are nonparametric in distribution, they are compared by Wilcoxon rank-sum test. No statistically significant difference in the cost of tests ordered by the primary care providers was found. The total cost of laboratory tests, however, is different for the patients followed in the two clinics. It is apparent that this difference is a function of the laboratory charges generated by the consultants.

In an effort to understand this difference, the referral patterns from the two primary care clinics were examined. The patients randomized to Internal Medicine Clinic were referred more often to other clinics than those randomized to Family Practice Clinic (chi-square, $P < .01$) (Table 3). Alternately, 152 (56 percent) of the 271 family practice patients made no visits to nonprimary care clinics compared with 96 (39 percent) of the 249 internal medicine patients. A similar significant referral pattern is also noted for obstetrics-gynecology, general surgery, and dermatology clinics.

The data were further analyzed searching for a subset of patients who were responsible for the high laboratory costs. This analysis led to removal of various groups of patients, eg, those seen in the General Surgery Clinic, the Dermatology Clinic, the Obstetrics-Gynecology Clinic, the Emergency Room, the Acute Care Clinic, and multiple combinations of these clinics. When the population size was reduced to less than one half the total sample, statistical significance was lost, and no one subset appeared to make a major contribution.

TABLE 3. NUMBER (AND PERCENT) OF VISITS TO NON-PRIMARY CARE, OBSTETRICS-GYNECOLOGY, GENERAL SURGERY, AND DERMATOLOGY CLINICS BY INTERNAL MEDICINE PATIENTS (N = 249) AND FAMILY PRACTICE PATIENTS (N = 271)

	Nonprimary Care Clinics							7 or More
	0	1	2	3	4	5	6	
Internal medicine	96 (39)	36 (14)	24 (10)	16 (6)	10 (4)	9 (4)	9 (4)	49 (19)
Family practice	152 (56)	20 (7)	16 (6)	16 (6)	10 (4)	9 (3)	6 (2)	42 (16)
Obstetrics-Gynecology Clinic*								
	0	1	2	3 or More				
Internal medicine	212 (85)	18 (7)	10 (4)	9 (4)				
Family practice	249 (92)	8 (3)	2 (1)	12 (4)				
General Surgery Clinic**								
	0	1	2	3 or More				
Internal medicine	218 (88)	15 (6)	6 (2)	10 (4)				
Family practice	254 (94)	9 (3)	0 (0)	8 (3)				
Dermatology Clinic**								
	0	1	2 or More					
Internal medicine	220 (88)	12 (5)	17 (7)					
Family practice	254 (94)	11 (4)	6 (2)					

* $P < .01$, by chi-square
 ** $P < .05$, by chi-square

DISCUSSION

This study followed an intention-to-treat protocol. Patients, once randomized to either clinic, continued to be analyzed with the assigned group even if they later chose another physician as their primary care provider. Patients who crossed over would have tended to dilute the results, not exaggerate them. It is not possible to make a value judgment as to which group of patients received better care, but there is clearly a different practice pattern. It is also important to recognize that this study was carried out in a residency training site based in a university hospital rather than in a community practice.

There was a higher utilization of clinical and laboratory services for patients randomly assigned for care by internists than for those randomized to family physicians. Patients followed by the internists were seen more often by both their primary care providers and in other care situations. The internists themselves actually ordered fewer

laboratory tests each visit, but because of their higher referral pattern to nonprimary care clinics and the greater use of the Emergency Room and Acute Care Clinic by their patients, more laboratory tests were generated in the subset of patients randomized to Internal Medicine Clinic. In three clinics, dermatology, obstetrics-gynecology, and general surgery, there was a statistically significant greater number of referrals from the Internal Medicine Clinic than the Family Practice Clinic. This finding is not unexpected, as these areas are those where family physicians receive training and provide care for patients whereas internists generally do not. The results of this study suggest that the current training of internal medicine house staff might not be entirely suited for primary care populations. There may be a need for additional training in ambulatory care disciplines not sufficiently covered at present in traditional internal medicine training programs.^{7,8}

While previous medical school and clinical experience may have an influence on physician behavior, such considerations were beyond the scope of the present study.

It may be possible that the practice styles of the providers studied here could change over time in a different clinical setting, eg, as a private prepaid group practice. Moreover, because of the design of the study, there are no outcome criteria for quality of care. It is thus impossible to evaluate the effect that the differing practice styles of internists and family physicians may have on patient care. Nevertheless, the difference demonstrated here in diagnostic and ambulatory health care delivery methods is real. It may be advantageous to reexamine the question with quality of care and outcome criteria built in so as to better understand true cost effectiveness.

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