

# The Value of a New Family Practice Center Patient to the Academic Medical Center

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**Background.** Family practice centers are important contributors to the financial viability of academic health centers, although they often are not the direct beneficiaries of their own labor. The greater time commitment and lower costs of most primary care creates significant financial hardships for departments of family medicine in university centers. This study describes the use of inpatient and outpatient health care services by new patients at a university family practice center.

**Methods.** A sample of 215 new adult enrollees at a university family practice center were examined for a 1-year period after their initial visit to the center. Total billings by the university hospital, specialty services, and the family practice center were tabulated by insurance type.

**Results.** Medicare patients generated the highest average charges (\$2501 per patient per year); self-indemnity patients generated the lowest average charges (\$301 per

patient per year). The largest portion of health services charges was generated by the university hospital inpatient service, which was responsible for approximately 60 cents of every dollar billed to patients in this study. Conversely, the Family Medicine Department billings generated only 17% of the total charges.

**Conclusions.** The findings of this study indicate that university-based family practice centers are significant contributors to the financial and educational base of the academic health center. If family medicine and associated primary care centers are forced to reduce their size or services because of financial difficulties, the impact will be felt by the university hospitals and by other specialty departments.

**Key words.** Family practice; academic medical centers; medical, fees; insurance, health, reimbursement. *J Fam Pract* 1991; 32:571-575.

Academic medical centers must consider the recruitment of patients for their family practices as a strategy for ensuring an adequate patient base.<sup>1</sup> The recent growth of managed health care programs is altering the traditional lines of referral to teaching physicians based in university hospitals, who, as a group, are generally considered to be expensive providers. It would therefore seem appropriate for an academic health center to enlarge the number of people in its own primary care pool so as to provide a stream of patients who would use the services of faculty members and house officers in other specialties, as well as the facilities of the university hospital. Such a strategy would also strengthen a department of family medicine by increasing its teaching opportunities and revenue stream at a time when its resources are being threatened.<sup>2</sup>

A decision to employ such a strategy must be based on a sound financial analysis. As academic health centers find that their patient revenues are failing to keep pace with costs and that the support for education is dwindling, there is little room for a decision that uses limited discretionary funds inefficiently. The potential for enhanced revenue must be evaluated in terms of the long-established fact that patient-derived income does not cover the cost of family practice residencies.<sup>3</sup>

This study examines the effect that new enrollees in a university-based family practice have on the university hospital and its associated clinical services. The authors examined the economic value of patients by the charges they incurred, as functions of both payment source and provider, and by their educational value as measured by the number of encounters they had with physicians.

## Methods

A stratified random sampling strategy was used to select 300 patients from the 1,548 new patients enrolled in the

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University of Cincinnati Family Practice Center in 1986. Five strata were developed according to a patient's payment classification at the time of his or her first visit to the Family Practice Center: (1) Medicare, (2) Medicaid, (3) managed care, (4) commercial insurance with assignment of benefits, and (5) self-indemnity.

The managed care category included patients enrolled in any of three health maintenance organizations (HMOs) or in a single preferred provider organization (PPO) operating at that time. Patients in the commercial insurance category carried one of several plans in which a negotiated assignment of benefits agreement existed between the insurer and the university health center and its affiliates. The Family Practice Center, the university hospital, and the private practice plans of other medical specialties were reimbursed directly by these insurers at a discounted rate. The self-indemnity category included patients who were classified as self-pay by the academic health center billing systems. Approximately 38% of patients in this group had no identifiable source of health care insurance. The remaining 62% had some type of commercial health insurance plan that required the patient to file the claims. These patients were typically asked to pay at the time of service or were billed by the university health care system and its affiliates. Most of these patients were insured by Blue Cross and Blue Shield.

Random samples of 50 enrollees were selected from each of the first four strata, and a sample of 100 enrollees were selected from the fifth stratum. After the initial selection, prediatric patients were removed from the sample because financial data other than that available from the Family Practice Center were unavailable at the time of the study. The final sample, by stratum, included: (1) Medicare,  $n = 50$ ; (2) Medicaid,  $n = 21$ , (3) managed care,  $n = 39$ , (4) commercial insurance,  $n = 25$ , and (5) self-indemnity,  $n = 80$ . The fifth stratum was made larger to compensate for the heterogeneity of the patient population identified as self-pay. For the 215 adult enrollees remaining in the sample, all billable health care services for 1 year were collected and recorded. Charges were identified by visit and billing source (ie, unit or department).

Data from each stratum were analyzed separately. Population estimates were determined, however, by weighting cases in each stratum by the proportion of the total population represented by the payment classification of the stratum (Table 1). The conversion weights correct a bias that was created by sampling strata in numbers disproportionate to their percentage in the population. The stratified sampling strategy was chosen to ensure that patients in payment classifications that naturally occur in small numbers could be adequately ana-

Table 1. The Number and Percentage of New Patients at the University of Cincinnati Family Practice Center in 1986 and the Number and Percentage of the Study Sample Population by Financial Class Including Conversion Weights Used to Normalize the Study Sample

Financial Class	New Patient Population n(%)	Study Sample n(%)	Conversion Weight*
Medicare	112 (9.8)	50 (23.3)	.4213
Medicaid	197 (17.2)	21 (9.8)	1.7636
Self-indemnity	661 (57.8)	80 (37.2)	1.5542
Commercial	39 (3.4)	25 (11.6)	.2932
Managed care	134 (11.7)	39 (18.1)	.6461

\* The conversion weight for each financial class is equal to the percent of the new patient population in a financial class divided by the percent of the study sample in that class.

lyzed statistically. Correspondingly, actual charges are multiplied by the conversion factor for each payment classification (Table 1).

The study period for each patient in the sample was the 365 days following the date of the patient's first visit to the Family Practice Center. Since first visits occurred from January through December 1986, charges identified for the study resulted from activity between January 1986 and December 1987.

The goal of data collection was to identify all charges for services provided by any unit of the academic medical center. This required a review of the billing records of the university hospital and the practice plans of clinical departments including the Family Practice Center. A three-phase system of data collection was developed to identify services and charges.

The first phase of data collection was a review of each patient's billing in the Family Practice Center. The automated billing system identified charges associated with each visit to the center that were billed by the Department of Family Medicine. These charges included professional fees, visit charges, and charges associated with procedures conducted in the center. The number of visits and total charges for a 1-year period were noted.

The second phase was a review of the billings made by the university hospital for each patient. These included charges that were generated for hospitalizations, some ancillary and diagnostic services (eg, outpatient pharmacy, laboratory, radiology), and several outpatient clinics. Each patient's hospital billing record was examined for the 1-year period following enrollment at the family practice center. In the course of the review process, we discovered that the hospital's billing records were periodically purged from the computer and stored on microfiche. To evaluate the effect of the removal of this information from the computerized records, we conducted a detailed study of a subsample of patient records and found that the number and amount of purged

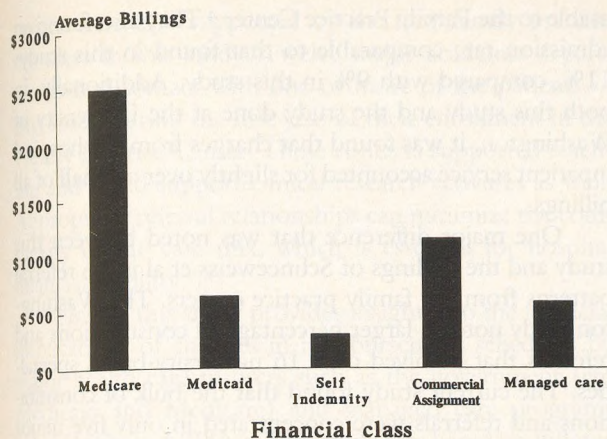


Figure 1. Average billings per adult patient by financial class for 1 year following patients' first visit to the University of Cincinnati Family Practice Center in 1986. The billings include all charges incurred by patients within the university hospital, its clinics and ancillary services, the Family Practice Center, and the independent practice plans of specialty services.

charges was small (ie, \$50 among 10 patients). Based on these findings, further examination of purged records was not pursued for the study.

The third phase was an extensive review of each patient's Family Practice Center chart. The chart review focused on the identification of consultative services received by patients. Any evidence in the chart that identified the possible use of consultative services was noted. Lists were compiled for all consultative services in the medical center. The billing offices of the specialty practice plans reviewed their records for any services billed during the study period. Although the variations in the automated billing systems in the different departments could not always provide the numbers of visits, all of the departments were able to identify total billings for individual patients.

## Results

Patients insured by Medicare had the highest average total of charges (\$2501), which was more than twice the average total of charges of patients in the next highest stratum (Figure 1). Patients in the self-indemnity stratum had the lowest average billings (\$301). The average billings for patients in the remaining three strata were between \$500 and \$1200.

Total billings to patients in two of the five strata (Medicare and self-indemnity) were significantly disproportionate to their representation in the study sample (Figure 2). The percentage of total charges generated by Medicare patients was nearly four times the percentage of

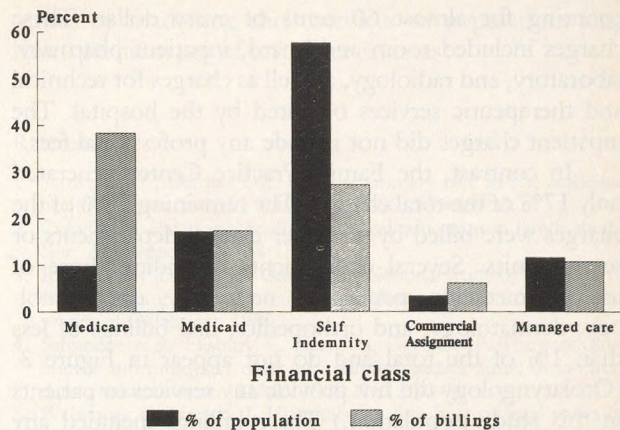


Figure 2. The percentage of all new adult patients in the University of Cincinnati Family Practice Center in 1986 in each financial class compared with the percentage of weighted billings generated by the study sample in each financial class. The weighted billings are converted from actual charges to reconcile differences in the relative numbers of patients in different financial classes between the patient population and the study sample.

patients in the Medicare stratum. Conversely, the percentage of total charges generated by self-indemnity patients was half the proportion of their representation in the study population. Medicare and Medicaid patients were much more likely to be hospitalized (18% and 19%, respectively) compared with patients in the other three financial classes (a range of 2.5% to 7.7%).

The largest portion of the charges was billings from the university hospital inpatient service (Figure 3) ac-

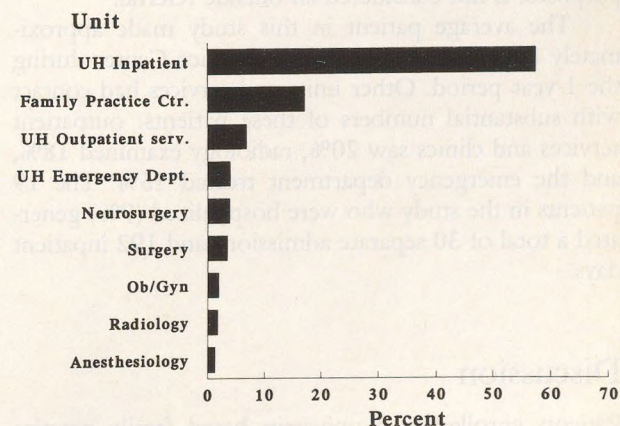


Figure 3. Percentage of total weighted billings by a sample of new adult patients during their first year of enrollment in the University of Cincinnati Family Practice Center for each medical center unit. The weighted billings are converted from actual charges to reconcile differences in the relative numbers of patients in different financial classes between the patient population and the study sample.

counting for almost 60 cents of every dollar. These charges included room and board, inpatient pharmacy, laboratory, and radiology, as well as charges for technical and therapeutic services operated by the hospital. The inpatient charges did not include any professional fees.

In contrast, the Family Practice Center generated only 17% of the total charges. The remaining 23% of the charges were billed by 13 other clinical departments or service units. Several departments, including those of internal medicine, psychiatry, neurology, ophthalmology, dermatology, and orthopedics, had billings of less than 1% of the total and do not appear in Figure 3. (Otolaryngology did not provide any services to patients in this study population.) These billings included any charges generated under the private practice plans of the individual departments and units. The services included professional fees and some technical fees not billed by the hospital.

A review of some of the selected patient charts revealed evidence of services provided by specialists who were not part of the university health center. It was very difficult to assess with any precision the amount of "leakage" to outside consultations. In a review of Family Practice Center statistics for all patients, it was possible to estimate, however, the amount and type of leakage that occurred. Specialists in obstetrics and gynecology, dermatology, and orthopedics were the most frequently used outside consultants during this period. These three specialty areas account for approximately two thirds of all outside consultations. A conservative estimate places the total number of outside consultations at 15%. This figure excludes consultations for pediatrics, which, for statistical purposes, is not considered an outside referral.

The average patient in this study made approximately four visits to the Family Practice Center during the 1-year period. Other units and services had contact with substantial numbers of these patients: outpatient services and clinics saw 20%, radiology examined 18%, and the emergency department treated 15%. The 19 patients in the study who were hospitalized (9%) generated a total of 30 separate admissions and 192 inpatient days.

## Discussion

Patients enrolled in a university-based family practice center favorably affected the economic and teaching base of the academic medical center. The Department of Family Medicine was not the greatest benefactor of its own patients, having billed only 17% of all charges. In a similar study at the University of Washington, Schneeweiss et al found that 13.5% of all charges were attrib-

utable to the Family Practice Center.<sup>4</sup> They also found an admission rate comparable to that found in this study: 11%, compared with 9% in this study. Additionally, in both this study and the study done at the University of Washington, it was found that charges from the hospital inpatient service accounted for slightly over one half of all billings.

One major difference that was noted between this study and the findings of Schneeweiss et al is the referral patterns from the family practice centers. The Washington study noted a larger percentage of consultations and referrals that involved over 16 university-based specialties. The current study found that the bulk of consultations and referrals were concentrated in only five major departments. It should be noted, however, that some additional referrals to internal medicine, psychiatry, and obstetrics and gynecology are included in the general category of university hospital outpatient services, since some of the outpatient clinics are not part of the practice plans of separate departments. Additionally, some of the differences may be attributable to significant numbers of referrals outside of the medical center to specialists in obstetrics and gynecology, dermatology, and orthopedics.

The financial data from this study underscore the natural partnership between a department of family medicine and a university hospital. Hospitals are already the largest source of support for such departments and have much to gain by continuing such support. Hospitals must be cautious in their support, however, in consideration of current fraud and abuse statutes that strictly limit the purchase of physician practices for patient referral.<sup>5,6</sup> Nevertheless, many academic health centers find themselves in competition with other hospitals for patients, and a well-established family practice center is an excellent way to provide quality primary care to the community while providing a major source of referrals to the academic health center.

The study also has implications for understanding the relative value of patients with different payment sources. Medicare patients were more likely to use health care services and to use more expensive services than patients in the other strata. Thus, the academic medical center and family medicine department might consider developing more services and programs for the elderly. Conversely, the self-indemnity patients were much less likely to use the services of the health center and generated a much lower proportion of total charges in relation to their proportion of the study population as a whole. Preventive services might be targeted at this group since it makes up the largest portion of the current patient population.

The educational programs of the academic medical

center were also supported by the new family practice enrollees in this study. Twelve major academic departments had contact with one or more of the patients in this study during the first year of their enrollment in the Family Practice Center. These contacts supported teaching and could support clinical research activities as well. Appropriate referral relationships can minimize the complexity of the case mix, which is essential for hospital financial stability.<sup>7,8</sup>

Finally, this study provides insight into the financial implications of changes in reimbursement schedules by major health care insurers such as the government (eg, Medicaid and Medicare) and managed care programs (eg, HMOs and PPOs). This study was based on billings and did not attempt to examine the actual amounts collected. Since most of these carriers negotiate discounted fees, changes in these agreements can have a substantial impact on the institution. Primary care centers have the opportunity to protect the academic health

center by marketing their services to populations that have specific types of insurance sources.

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*For editorial comment, see page 563.*

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