Impact of the Limited Generalist (No Hospital, No Procedures) Model on the Viability of Family Practice Training

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Background: **Some doubt the desirability and cost-effectiveness of continuing to provide an expanded scope of primary care practice. Additionally, there has been concern about declining reimbursement from Medicaid and Medicare. Although an expanded scope of patient care services are required for training, we wanted to determine whether these services drain resources and time from other primary care activities.**

Methods: **To determine the financial impact of deleting services other than office visits from an urban primary care practice, we tabulated charges, economic case mix, and actual collections during 12 consecutive months. Using regional and national norms, the practice set charges for hospital services, office visits, and procedures at approximately 50th percentile as a maximum. Common diagnostic and therapeutic procedures were tabulated, and gross charges per item per year were tabulated. To validate net collection predictions for a predominately TennCare (Medicaid) practice and compare these with projected net collections from private practice, charges were compared with projected collections using two expectations (40% net and 80% net). Overall collections were projected and then compared with actual collection. For hospital services and office procedures, costs were attributed to equipment, training, liability insurance, and lost opportunity for office visits.**

The setting was an urban family practice teaching program providing hospital services, hospital deliveries, newborn care, office visits, and a variety of office procedures. There were 30,262 office visits, 510 non-pregnant hospitalizations, 252 deliveries, 1,352 office radiographs, and a variety of common office-based diagnostic and therapeutic procedures, such as electrocardiograms (408), skin surgeries (265), gastrointestinal endoscopies (306), diagnostic obstetric sonograms (525), non-stress tests (95), and colposcopy (161). The main outcome measures were the financial values calculated after subtracting costs for hospitalist services, office visits, and procedures.

Results: **After lost opportunities for office visits are deducted, hospital services created positive revenue ranging from $167,306 to $340,612, depending on the net collection scenario chosen (ie, worst case versus best case).**

Conclusions: **Revenue was adequate for reimbursement of equipment, staff, and physician time in either case. For procedural activities in the office, there was a net gain of $372,974 in charges once opportunities for lost office visits were deducted. Even within the 40% net collection scenario, revenue was more than adequate to pay for overhead and equipment. For this practice with 84% Medicaid-Medicare accounts, projected collections of 40% underestimated slightly the actual net revenue. (J Am Board Fam Pract 2002;15:191–200.)**

The clinical value of diagnostic and therapeutic procedures is not contested, yet several newly graduated physicians have told us that procedures are not time effective. Studies have established that a variety of procedures can and should be performed by qualified family physicians, general internists, pediatricians, and others. Published examples include radiograph interpretation,[1] diagnostic sonography,[2,3] flexible sigmoidoscopy,[4] colposcopy,[5] exercise treadmill testing,[6] electrocardiogram interpretation, esophagogastroduodenoscopy,[7] colonoscopy,[8] cesarean section,[9] and vaginal deliveries.[10] Some, however, continue to advocate a system in which these procedures are limited to physicians with subspecialist training.[11,12]

Additionally, the hospitalist movement has challenged the need for broad-based training in general pediatrics, family practice, and general internal

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medicine. In 1999, the president of the Society of General Internal Medicine said, "It's inefficient, often impractical, and sometimes simply not sensible for a busy office-based practitioner to make it to the hospital on a regular basis."[13] Other studies support centers of excellence compartmentalized to a particular disease or organ system.[14,15] In community practices, however, patients, physician colleagues, and other hospital staff emphasize continuing comprehensive care coordinated by one physician. Hospitalists might function best in quaternary and tertiary care centers, where fragmented care is the rule. Some tertiary care experts have questioned the value of continuity, but evidence and common sense supports the notion that the public values this type of coordinated care. Continuity of care in the hospital, diagnostic procedures, and therapeutic procedures has a similar appeal.[16,17] Community-based continuity of care has had a positive impact on the ability of physicians to provide care in diabetes.[18]

The disconnect between academic theory and community practice has persisted despite previous observations and concerns from Reuben and colleagues.[19] This disconnect frequently focuses on scope of training for generalist physicians. In 1986, a presentation entitled, "Should Family Physicians Be Allowed to Teach Procedures? Clinical Privileges, Outcome Data, and Academic Freedom" predicted that, in addition to the philosophical and spiritual values of continuing comprehensive care, procedural revenue would be vital for the survival of the teaching practice.[20] To fulfill obligations to patients and student physicians, equipment must be purchased, staff trained, and supplies replaced.[21,22]

After an extensive overhaul of the generalist curriculum at an established medical school, data were published describing the rural phase and associated hospital-procedural services.[23] The current study focused on an urban family practice during the calendar year 1997, and describes the clinical volumes, costs, charges, and revenues of services stratified among office visits, non-pregnant hospital services, pregnancy services, newborn services, emerging technologies, and office procedures.[24] The null hypothesis stated that a limited generalist practice without procedures and hospital services would have no significant impact on the financing of the teaching practice. The value of these services in patient care and education is well established.[1–10] A second area of study was to validate the prediction that a predominantly Medicaid (TennCare) and Medicare practice would collect approximately 40% of regionally customary charges compared with a common private practice expectation of at least 80%. Determining the net collections would be helpful in budgeting for the success of medical practices heavily dependent on Medicaid and Medicare funding.

Methods

Tabulation of Data

Data describing case mix, patient volumes, services provided, charges, adjustments, and collections were taken from departmental budget documents. These documents included monthly summaries of case mix, charges, collections, and accounts receivable. Clinical activity was tabulated from daily logbooks, resident activity reports, and hospital census reports to check the validity of billing data. Data were assembled describing gross charges for all services. Charges were set at a median value for regional norms and crosschecked using data from state and national data services.[25–27] Contractual revenue for services in the emergency department, several long-term care facilities, and grants was excluded from this analysis.

To allow for capitation coverage of some of the patients, charges for each service were tabulated in the normal manner during day-to-day activities of the practice. Adjustments were then made in such a way that income from collections could be measured against the gross charges from which they originated.

For these assumptions, internal validity was studied by comparing data from an all-inclusive quarterly financial report during 1997. This report was taken from billing data and reflected total clinical activity and charges during 3 consecutive months. Variance was measured by comparison against daily appointment schedules. Clinical activity and associated charges were stratified to allow calculation of gross charges, adjustments, and net collections for office visits, hospital services, and specific categories of procedures for additional analysis. After excluding hospital charges and obstetric charges, charges were isolated for office radiograph and office procedures other than laboratory and radiograph.

Table 1. Diagnostic and Therapeutic Procedures in the Office: Opportunity Costs, Overhead, and Charges.

Procedure	Average Minutes Required	Visits Lost No. ($)	Staff, Room* Needed	Average Charge for Service ($)	Financial Impact ($)	Training Requirements	Cognitive Expertise Required*	Training In Residency
Colposcopy with biopsy	15	1 (60)	Staff–1 Room–1	318	Positive (248)	Residency or 2 days CME	Papanicolaou smear	Yes
Colposcopy with cervical cryosurgery	15	1 (60)	Staff–1 Room–1	440	Positive (380)	Residency or 2 days CME	Office gynecology	Yes
Flexible sigmoidoscopy	20	1.3 (80)	Staff–1 Room–1	200	Positive (120)	Residency or 1 day CME	Gastrointestinal symptoms/no cancer risk	Yes
Colonoscopy	60	4 (240)	Staff–1 Room–1.5	947	Positive (707)	Flexible sigmoidoscopy skills, 2 days CME, clinical cases	Gastrointestinal symptoms	Yes
Colonoscopy with polypectomy	60	4 (240)	Staff–1 Room–1.5	1,317	Positive (1,077)	As above	Electrosurgery	Yes
Esophagogastroduodenoscopy	30	2 (120)	Staff–1 Room–1.5	828	Positive (718)	As above	Gastrointestinal symptoms, biopsy	Yes

CME—continuing medical education.
Note: Net charges were significantly positive, suggesting that additional collection would be available to pay for equipment, staff, and training. Training costs were minimal given the availability of training in residency or CME.
*Room needed is based on multiples of the standard examination room of 8 by 10 sq ft. Slightly more square footage is needed for gastrointestinal endoscopy; ie, 1.5 rooms (120 sq ft).

Opportunity, Staffing, Insurance, Training, and Equipment Costs in the Office

Costs were allocated to procedural services. Additional medical liability insurance costs were calculated by obtaining mature annual insurance premium costs for a standard policy of up to $1 million per incident or up to $3 million aggregate per year. Basic costs for a nonprocedural policy were subtracted from the cost of a policy for normal vaginal deliveries, office imaging, and all the procedures described in this study. The result was a net additional insurance cost for the hypothetical 5-physician group.

Costs of lost opportunity for additional office visits were calculated by describing the average number of minutes necessary for an office visit (15 minutes),[28] colposcopy (30 minutes), flexible sigmoidoscopy (20 minutes), colonoscopy (60 minutes), esophagogastroduodenoscopy (30 minutes), obstetric sonography (20 minutes), and office surgery (30 minutes). Average office charges were subtracted from procedural charges to attain a net charge (Table 1). Office productivity was benchmarked against other published norms.[29]

Insurance, overhead, and staffing were allocated accordingly. Equipment costs were calculated from invoices and average retail prices of medical equipment vendors. Purchase of new gastrointestinal endoscopy equipment assumed fiberoptic technology, because many physicians have purchased flexible sigmoidoscopy systems that also support esophagogastroduodenoscopy and colonoscopy. A reasonable cost between extremes was chosen. For example, reliable used equipment is available at $12,500, whereas video equipment would cost $42,000 or more. In year 1, $25,000 was allocated for gastrointestinal endoscopy equipment, which allowed $12,500 each for a gastrointestinal endoscope and a colonoscope. Costs include 7% sales tax. Equipment costs are displayed in a table for comparison with volume of activity, charges, and collections under the two common assumptions about net collections and total charges (Table 2).

Derivation of Net Revenue Assumptions

Many physicians expect Medicaid and Medicare reimbursement to pay an average of 40% of charges

Table 2. Clinical Charges, Collections, and Costs for Common Medical Problems in a 5-Person Family Practice Group.

Common Clinical Problems	Needed Equipment	Charges Per Unit ($)	Number Per Year	Gross Charges ($)	Equipment Cost ($) Year 1	40% Collected ($)	80% Collected ($)
Chest pain	Electrocardiograph	51	408	20,808	3,995	8,323	16,646
Cancer-prevention package							
Skin surgery—lacerations	Office stock	243	265	64,395	9,577	25,758	51,516
Papanicolaou smear	Office stock	ov (60)	1,923	115,380	1,000	46,152	92,304
	Colposcopy	296	161	47,636	8,449	19,062	38,125
	Cervical cryo	440	41	18,040	3,442	7,216	14,432
Colon cancer	Flexible sigmoidoscope	200	73	14,600	5,783	5,840	11,680
Abdominal pain, polyp package							
Dyspepsia, GERD	Endoscope	838	104	87,152	12,300	34,861	69,722
Polyp, colorectal cancer	Colonoscope	947	129	122,163	12,240	48,865	97,730
Urgent care package							
Pain relief	Intravenous sedation, analgesia	120	215	25,800	1,000	10,320	20,640
Dyspepsia/COPD	Pulse oximeter	40	215	8,600	2,454	3,440	6,880
Musculoskeletal injury, URI	Office radiograph	82	1,323	108,486	27,992	43,394	86,789
Hospital package							
Admissions	Hospital	423	510	215,730		86,292	172,584
Maternity care							
Deliveries	Hospital	2,202	252	579,600		231,840	463,680
Newborns	Hospital	198	252	49,896		19,958	39,917
Pregnancy problems	Sonograph	320	525	168,000	22,826	67,200	134,400
Totals				1,646,306	110,058*	658,521†	1,317,045†

Note: Data from 30,262 office visits during 1997. The data describe 12 consecutive months from Department of Family Medicine, University of Tennessee.
ov—office visit, cyro—cryosurgical device, EGD—esophagogastroduodenoscopy, COPD—chronic obstructive pulmonary disease, URI—upper respiratory tract infection.
*Year 1 costs can be spread over 3 to 4 years. Worst-case analysis with cash payment in full during year 1 is depicted.
†Rounding to significant digits caused discrepancy of 3 units (2 × 658,521 = 1,317,042).

(net collections = 0.4 × charges). For validity, this assumption was checked against departmental reimbursements in these accounts during fiscal year 1996 and fiscal year 1997. The Medical Group Management Association suggests that at least 80% of gross charges are collected from private health insurance companies. This rate was assumed to be a reasonable reflection of payment rates expected in many private practices (ie, net collections = 0.8 × charges). This rate is a conservative estimate from annual data published by the Medical Group Management Association.

To examine further the 40% rule, services were stratified by group and individually, and they were compared with published reimbursement schedules of Medicaid insurance intermediaries of the index state.

Opportunity Costs from Hospital Service

Projected revenue from lost visits and hospital time were deducted according to both collection scenarios. Lost visit charges were arithmetically derived from the previous assumptions, ie, one colonoscopy = four office visits. Average length of stay (6.2 days) for cases other than pregnancy and newborn care was multiplied by number of admissions (n = 510). Average length of stay (1.8 days) for vaginal deliveries and newborn care was multiplied by number of deliveries. All operative obstetric cases

Table 3. Total Charges and Two Reimbursement Predictions for an Urban Family Practice during 12 Consecutive Months of 1997: Services, Charges, and Predicted Net Collections.

Service and Annual Volume	Average Charge per Unit ($)	Total Charges ($)	Prediction 1 TennCare (Medicaid) 40% Collections ($)	Prediction 2 Private Insurance 80% Collections ($)
Office visits (n = 30,262)	60	1,815,720	726,288	1,452,576
Hospital charges:				
Medical, surgical, pediatrics (n = 510) (ALOS 6.2 days)	423	215,730	86,292	172,584
Deliveries (n = 252) (ALOS = 1.8 days)	2,300	579,600	231,840	463,680
Newborns (n = 252)	198	49,896	19,958	39,917
Totals without procedures		2,660,946	1,064,378	2,128,757

Note: Clinical volume and average charges were used to calculate total charges for the year 1997.
ALOS = Average length of stay. Case mix 84% Medicaid and Medicare.

were referred with all surgical revenue accruing to the obstetrician who performed the cesarean section.

Each hour required for hospital services between the hours 0830 to 1700 weekdays was assumed to lose four average office-visit charges (ie, 4 × $60 = $240/h). Average time per visit was taken from national norms.[25,30] Gross charges for lost office-visit revenue were subtracted to derive a new net revenue figure. Time budget studies showed an average of no more than 2 hours' office-visit time per weekday was required to conduct visits to all hospital patients for the entire group. Consultation (referral frequency in the hospital) was noted. Night call and weekend coverage was not subtracted from office revenue, because these activities occurred at times when office visits were not scheduled. Hospital time for vaginal deliveries was calculated from a convenience sample of 20 consecutive deliveries.

Internal and External Validity

Internal validity was studied by comparing data from an all-inclusive quarterly financial report during 1997. This quarterly report was taken from encounter forms, procedural logbooks, and hospital census reports, and it reflected total clinical activity and charges during 3 consecutive months.

External validity of procedural volume was checked by acquiring volume data for a similar 12-month period from another teaching program and another private practice in the region. Four procedure groups (esophagogastroduodenoscopy, flexible sigmoidoscopy and colonoscopy, colposcopy, and office surgeries) were compared, and total office visits were compared.

Results

Practice Demographics

Clinical volumes, costs, charges, and two potential reimbursement approximations are depicted in Table 3. Office procedures were further stratified in Table 4.

During the study year, there were 30,262 office visits. Pediatric activity was defined by patients' age of 17 years or younger and constituted 29% of total visits. The female percentage of office visits was 59.7% (18,060). In the office, approximately 12% of the population was older than 65 years. During 1997, the practice case mix by percentage of charges was 65% TennCare (Medicaid), 19% Medicare, 13% commercial, insurance, and 8% self-pay. Net revenue as a percentage of gross charges was 42.7% for Medicaid (TennCare) and 43.1% for Medicare. Collections from commercial insurance were 60.2%. Patients in this practice were insured predominantly by Medicaid and Medicare (84%).

There were 252 deliveries, and 1,891 Papanicolaou smears. Hospital activity with average charges is depicted in Table 1. For comparison, office visits, average charges, and total charges are depicted in Tables 3 and 4.

Random checks of billing data with procedure logs, hospital census, and appointment book data reflected a variance of less than 5%. The data, therefore, represent reasonable approximations ±

Table 4. TennCare Reimbursement for Procedural Revenue During 1997 (Office Visits = 30,262).

Procedures	Clinical Volume 1 Year	Average Charge ($)	TennCare* Allowed Payment ($)	TennCare* Collections ($/y)
Radiographs	1,323	82	28	37,044
Electrocardiograms	408	51	23	9,384
Skin surgery	265	243	97	25,705
Esophagogastroduodenoscopy	104	838	281	29,224
Colonoscopy	129	947	315	40,635
Flexible sigmoidoscopy	73	200	85	6,205
Colposcopy†	161	296	122	19,642
Sonography‡	525	320	130	68,250
NST/AFI	95	376	144	13,680
Subtotals				249,769

NST/AFI = Non-stress testing with an amniotic fluid index.
*Actual allowed Medicaid (TennCare) reimbursements were less than 40% for some items. Esophagogastroduodenoscopy and colonoscopy allowable included reimbursements for intravenous supplies, pulse oximetry, intravenous start, medications, and sedation-analgesia (CPT-4 code 99141). TennCare reimbursements exceeded 40% for care of children (office visits) (88%), maternity care (obstetrics) (46%), colposcopy (41%), and electrocardiogram (45%). Conversely, radiographs (34%), gastrointestinal endoscopy (34%), and sonography (36%) reimbursements averaged less than 40% of charges.
†Colposcopy will allow charges for an office visit in addition to the procedure.
‡Most sonographic examinations are gynecologic or pregnancy related.

5%. Billing was always less than documented clinical activity.

Opportunity, Insurance, and Training Costs

Maternity care services added $15,990 in cost per year for the group assuming purchase at the most expensive level (ie, 5 years into practice).

Table 1 depicts the analysis whereby overhead and lost office visit opportunity costs are deducted from procedural charges. Table 1 also displays the average training requirements needed for acquisition of the particular skill studied.

Using data from the health services research literature, comparisons were made with an average physician who has 6,000 office visits in an average year (Table 5).

Projected Versus Actual Revenue

After establishing charges and expected collections for each health care service, a comparison was made between the so-called 40% and 80% prediction for collected revenue. Equipment costs show that acquisition of this equipment was feasible using the expected collections from a worst-case scenario (40%) or a better case scenario (80%). As displayed in Table 2, expected income within the worst-case scenario was adequate for purchase of equipment in year 1 for every service studied.

Expected income was further studied in Table 2, where actual Medicaid reimbursements were compared with the worst-case hypothesis (the 40% hypothesis). Although TennCare reimbursements averaged less than 40% for radiographs (34%), gas-

Table 5. Average Environment in Medical Practice: Basic Assumptions.

Environment Characteristic	Basic Assumption
Average work year of 1 physician	6,000 office visits*
Average physician work year	47 wk (5 wk vacation and continuing medical education)
Average number of visits per day	28
Average day	≥85% established patients
Average office visit charge	$60
Net collections (worst case scenario)	.40 × charges
Net collections (best case scenario)	.80 × charges

Note: Assumptions included 6,500 office visits per full-time equivalent physician per year as described above.
*Adapted from J Fam Pract 1998:47:434.

Table 6. Comparison of Procedural Volumes Between Two Programs During 12 Consecutive Months.

	Index Program	Comparison Program
Total office visits per year	30,262	26,481
Colposcopy	161	252
Esophagogastroduodenoscopy	104	86
Flexible sigmoidoscopy, colonoscopy	202	167
Office surgeries	265	313
Subtotal for these procedures	732	822
Procedures per 1,000 visits	24.2	31.6

Note: To assess external validity, another family practice program of similar size from the same region shared data comparing procedural volumes in their family practice center during the same year. The study program did not contain an excessive number of procedures per 1,000 visits.

trointestinal endoscopy (34%), and sonography (36%); TennCare reimbursement exceeded 40% for care of children office visits (88%), maternity care (46%), colposcopy (41%), and electrocardiograms (45%).

For the Table 4 procedural group, total charges of $669,640 were compared to allow reimbursement schedules predicting $249,769 for a net collection ratio of 37%. This rate represents the lowest actual collection for these services.

External Validity for Office Procedure Frequency

To provide external validation for the volume of procedures performed in the study practice, a comparison practice in the region was selected as a convenience sample for review. Table 6 shows that the index program did not have an excessive amount of procedures when compared with a similar program in the region. Actually the number of procedures in the study program was less than the number of procedures in the comparison practice.

Bottom-Line Results

When comparing the potential revenue lost from office visits as a result of hospital activities (Table 7), there is a positive dollar value for these activities under both collection scenarios. For example, after office visit cost (opportunities lost) is deducted from net hospital income, there is a positive collected income available to the practice. Within the 40% scenario, this amount is $171,338. Within the 80% scenario, the amount is $348,676. Using either scenario, there is adequate revenue to support the physician work necessary for maintenance of the hospital services.

In Table 8 charges gained are compared with charges lost for selected procedural activities. In this practice, procedures achieved an additional $372,974 in charges. To check the validity of these assumptions, actual collection percentages for two separate years were reviewed from billing records. Assuming collections would be similar to the hypothesis of 40%, net collections were divided by gross charges. In fiscal year 1996, the net collection percentage was 46.3%. In fiscal year 1997, the net collection was 45.2%.

Table 7. Results of Office Time Lost: Hospital Hours Required During Potential Office Visit Time.

Hospital Activities	Number of Visits	Hours Spent	40% Reimbursement ($)	80% Reimbursement ($)
Activity				
Non-pregnancy-related admissions	510	510		
Non-pregnancy-related hospital visits	2,991	747	86,292	172,584
Vaginal deliveries	252	294	231,840	463,680
Newborn admissions	252	126	19,958	39,916
Pregnancy and newborn follow-up visits	408	102		
Subtotals and net				
Subtotal from hospital activity			338,090	682,180
Subtotal lost office charges (240/h)		1,779	170,784	341,568
Net value			167,306	340,612

Note: After office visit cost (opportunity lost) is deducted, net hospital income produces net income ranging from $167,306 to $340,612 per year if 1,737 hours of office time are required to provide hospital services. In reality, the average time needed was less than 34 hours per week. Two thirds of hospital activity occurred before 0830 and after 1700. Although vaginal deliveries required 3.5 hours on average, most of this time occurred after office hours.

Table 8. Financial Impact of Procedural Time Replacing Potential Office Visits.

Procedure	1997 Volume	Minutes Required	Total Hours Spent in 1997	Procedural Charges Made ($)	Office Visit Charges Lost ($)
Skin surgery	265	30	132.5	64,395	31,800
Flexible sigmoidoscopy	73	20	24.3	14,600	5,832
Colonoscopy	129	60	129.0	122,163	30,960
Esophagogastroduodenoscopy	104	45	78.0	87,152	18,720
Colposcopy	161	15	40.3	47,656	9,672
Obstetric sonography	525	20	141.7	168,000	34,008
Total charges				503,966	130,992

Note: These procedures achieved an additional $503,966 in charges, while consuming 545.8 hours of physician effort. Assuming 4 office visits at $60 each hour, lost office visit charges were $130,992 for a net gain in charges of $372,974.

Discussion

This study concludes that primary care physicians can afford to provide and should provide hospital and procedural services. Should society continue to invest in training young family physicians to perform deliveries[31,32] when only 25% to 30% of family physicians deliver babies? If, through the use of a new procedure, an average physician could substantially upgrade clinical skills while remaining active in his or her community practice, would physicians learn, purchase equipment, and perform that procedure? Other primary care specialties struggle with scope of practice as an issue,[33–36] but these data support the broader scope of practice described in the study.

During this study, both authors served as senior faculty within a department that grew to be one of the largest in the country. The department developed a brand of procedurally enhanced primary care known to attract young physicians.[37] In tracking resident graduates and previous student advisees, it appeared that some were taking jobs in corporately managed systems where the physicians were encouraged, if not required, to limit their practice to office visits without procedures and without activity in the hospital. While claiming continuity, corporate efficiencies inexorably channeled the delivery of babies, hospital care, urgent care, and procedures to other physicians who were assigned to that particular product line. This study suggests that revenue is being transferred from family physicians to others in the corporate practice.

One recent graduate told us her new employers had data showing that office procedures and urgent care visits ". . . were not time effective." She assured us that she would get the data, but she never did. Since 1995, most of the corporate practices have incurred substantial financial losses on the primary care practices they purchased.[38–40] Primary care salaries might decrease to the range of that earned by nurse practitioners.[41,42] This scenario had been predicted by Hsiao et al in 1993.[43] In addition to loss of revenue, these limited generalists commented on the loss of providing coordinated continuing care to patients with complex disease.[44] The findings of this study do not address continuity issues, but support the loss of substantial revenues.

When making projections for total procedural revenue in this environment, the prediction of 40% net collections for specified procedural services in the office projected $267,856 this year. Because collections for this group were actually 37%, the 40% scenario overestimated revenue by $18,087 for the year. This shortfall, however, was overcome by the above-average collections for children's services and women's health care (deliveries). In all cases, the revenue amounts justify purchase of the equipment and the time spent by physicians in providing these services.

Limitations of this approach include the validity of its assumptions. The study assumed average productivity standards of 6,000 office visits per year per full-time equivalent physician. With 5 weeks for vacation and continuing medical education and a 5-day workweek in the office, the average physician is expected to see 28 patients in a workday. This practice of 30,000 visits, therefore, simulates 5 full-time equivalent physicians (Table 2).

In an average day, other researchers have found that approximately 15% of each day's visits are new patients. Other office visits are classified as estab-

lished patients. These data were used to generate reasonable assumptions regarding case mix of the average visit. The exact number of new visits per month in this practice was 10.8% of total visits. These comparisons suggest external validity for the underlying assumptions of the study.

Weaknesses of this study include generalizability, accounting variance, and the very basis of defining usual, customary, and reasonable charges. Data collection for this study took place for 1 year in one practice in one location. Other practices might have varying degrees of hospital and office procedures. This practice, however, is a good study subject because of the wide variety of services available for analysis.

Another weakness is the accounting of value for omission of extra hours spent after office hours and on weekends. Physicians averaged slightly more than 3 hours in the hospital for each delivery. An unpublished study from the University of Southern California, Department of Family Medicine, found hospital time to average 3 hours for each vaginal delivery. Some say that these physicians could earn this income in a more efficient manner by using this time to care for additional patients in the office. This could be true, but the purpose is to provide medical services to a community of patients who require care in several environments. Most physicians do not enter medical practice with the sole purpose of maximizing revenue by any legal means available to them.

In the absence of other data describing this issue, these data from a teaching practice that provided a broad array of services seem important. This descriptive study examined one dimension of a null hypothesis that stated, "Hospital and procedural services are not time effective in primary care practice." We submit that the null hypothesis has been disproved in this example. These services have established value in the care of patients and in the education of young physicians. The financing of the training programs and private practice will suffer when these services are removed from the activities of a generalist physician.

These data are important in aligning the economic incentives for an expanded scope of practice. Although a recent study expressed concern regarding the comfort of primary care physicians' scope of practice,[33] 76% reported satisfaction with their expected scope of care. As long as quality of care is maintained or improved, there should be no financial impediment to the training of these physicians in techniques that support a broad scope of practice.

Finally, it seems reasonable to predict net collections in the range of 40% of standard charges in a predominantly Medicaid (TennCare) and Medicare practice at this time. This index practice based charges on a rigorous study of regional and national norms. Historically, usual, customary, and reasonable were adjectives used to describe acceptable charges for various services. There is no universally accepted charge or reimbursement even though the federal government has adopted much of the resource-based relative value scale of Hsaio et al.[43] Although resource-based relative value systems were designed to encourage primary care practices, these data suggest that, without hospital and procedural services, primary care practices will be more difficult to sustain financially.[45]

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