The Duration of Ambulatory Visits to Physicians

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BACKGROUND. The objective of our study was to determine the typical length of ambulatory visits to a nationally representative sample of primary care physicians, and the patient, physician, practice, and visit characteristics affecting duration of visit.

METHODS. We used an analysis of cross-sectional survey data to determine duration of visit and the characteristics associated with it. The data sources were a random sample of the 19,192 visits by adults to 686 primary care physicians contained in the 1991-1992 National Ambulatory Medical Care Survey, and the results of the Physician Induction Interview conducted by the National Center for Health Statistics. Duration of visit was defined as the total time spent in face-to-face contact with the physician.

RESULTS. Mean duration of visit was 16.3 minutes (standard deviation = 9.7). Multivariate analysis allowed the calculation of the independent effect on visit length of a variety of characteristics of patients, physicians, organizational/practice setting, geographic location, and visit content. Certain patient characteristics (increasing age and the presence of psychosocial problems) were associated with increased duration of visit. Visit content was also associated with increased duration, including ordering or performing 4 or more diagnostic tests (71% increase), Papanicolaou smears (34%), ambulatory surgical procedures (34%), patient admission to the hospital (32%), and 3 preventive screening tests (25%). Reduced duration of visit was associated with availability of nonphysician support personnel and health maintenance organization and Medicaid insurance.

CONCLUSIONS. Multiple factors affect duration of visit. Clinicians, policymakers, and health system managers should take these considerations into account in managing physician resources during daily ambulatory practice.

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An important challenge facing health care systems is the optimal management of physicians' time. Because physicians are an expensive resource, improving their efficiency of practice is important for controlling costs. Their availability to patients also has an important influence on patients' access to and satisfaction with health care services.

The duration of the office visit is one obvious marker of the expenditure of physician resources during daily practice.[1-4] Reducing the duration of visit may improve physician productivity by increasing the number of patients seen per unit time. However, shorter visits may also be associated with adverse effects, including reduced provision of certain preventive services,[2] reduced participation of patients in medical decision making,[5] reduced attention to patients' psychosocial problems,[6] reduced patient satisfaction,[7] and an increased tendency to order laboratory tests, prescribe medications, and order consultations.[8]

Improved information on the determinants of visit length may enable health care managers and policymakers to enhance the productivity of ambulatory physician practice while avoiding adverse effects resulting from arbitrary reductions in length of visit. Previous research has identified several factors that influence visit length, including characteristics of the physician, patient, practice setting, and content of visit. In one of the few recent studies that explicitly examined this subject, Smith and colleagues[1] found that undefined differences in practice style between physicians explained the largest proportion of variation (22.8%) in visit length among internists practicing in the general medicine clinic of a university-affiliated Veterans Affairs hospital. Patient characteristics explained an additional 7% of variance. Visits were significantly longer for patients who were older, white, or new to the physician or clinic or who had chronic illnesses, thicker medical records, recent hospitalizations, more medications, or abnormal laboratory tests. Although that study did not address practice setting, other research has shown that the ability to delegate tasks to other personnel[2,9] enhances physician productivity and that prepaid group practice settings may be associated with reduced duration of visit.[10]

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Though revealing, past research on duration of visit has been limited in a number of ways. Those studies have tended to rely on data from selected practice settings (publicly owned facilities or hospital outpatient departments) that may not be representative of the office settings in which most ambulatory care is delivered.[1,2] Many past investigations have also lacked state-of-the-art case-mix adjustments and the ability to control simultaneously for the many factors that may affect duration of visit.

The research reported here uses data from the 1991-1992 National Ambulatory Medical Care Survey (NAMCS) to assess influences on duration of ambulatory visits by adults. By linking data from NAMCS to the rarely used NAMCS Physician Induction Interview, we assess the independent contribution to visit length of patient characteristics, physician characteristics, organizational/practice setting, and the number and types of services provided. We also explore the implications of these findings for policy and management. A unique characteristic of our work is that it analyzes influences on visit duration using both a representative national sample of adult primary care encounters and a data set that allows us to control simultaneously for a broad array of potential factors affecting duration of visit.

METHODS

DATA

These analyses are based on data from the 1991 and 1992 NAMCs and their related Physician Induction Interviews.

NATIONAL AMBULATORY MEDICAL CARE SURVEY

The NAMCS is an annual survey of US office-based, patient care physicians. Conducted and supported by the National Center for Health Statistics since 1973, the NAMCS is intended to provide data characterizing the practice of physicians in ambulatory, community-based settings. One important feature of the NAMCS is that the data collected do not affect physician reimbursement, so physician reports are presumably unbiased by efforts to maximize payment, which may affect many administrative databases.

The NAMCS records a random sample of community-based physicians stratified by specialty and geography. Participants are selected from the master files of the American Medical Association (AMA) and the American Osteopathic Association (AOA). The sample excludes physicians practicing in health centers, some hospital outpatient departments, and emergency rooms, but includes health maintenance organizations. For sampling purposes, AMA specialty designations are employed. These are confirmed in personal interviews with respondents agreeing to participate.

For each participating physician, the NAMCS selects a week at random and samples from 20% to 100% of patient visits. For each patient visit, physicians or their office staff complete encounter forms detailing patient demographics, diagnoses, specific clinical services provided, current medications, visit characteristics (including duration), and postvisit disposition.

For each visit record, the National Center for Health Statistics provides a visit weight calculated from the physician and visit sampling rates, adjusted for nonresponse.[11] Statistical aggregation using these weights allows estimation of characteristics of visits occurring in office-based medical practices nationwide. Missing data are limited to approximately 5% of most data fields. Validation studies performed in earlier years have confirmed the general accuracy of the information obtained.[11]

For the purpose of this study of adult primary care visits, we defined primary care physicians as those identifying a specialty of family medicine, general practice, and general internal medicine. General internists consisted of internists who did not identify a particular medical subspecialty. Obstetrician-gynecologists were also included in the analysis because of the frequency with which women of child-bearing age receive primary care from this specialty group.

A total of 72% of sampled physicians agreed to participate in the 1991 survey, and 73% in 1992, yielding 2912 physicians reporting on 68,401 visits. This study analyzed data reported by 686 primary care physicians and obstetricians gynecologists in this sample, who provided information on 19,431 visits by patients age 18 years or older. Visits were excluded from the database if the duration was recorded as 0 or as more than 2 hours (239 visits, 1.3% of the total), leaving a total of 19,192 visits for use in the analysis.

PHYSICIAN INDUCTION INTERVIEW

The Physician Induction Interview consisted of a personal interview conducted by field representatives of the census bureau on behalf of the National Center for Health Statistics with each physician who agreed to participate in the NAMCS. The 1991-1992 Physician Induction Interviews collected data on physicians' specialties (to verify AMA and AOA specialty information), age, sex, and a variety of characteristics of their practices.

ANALYTIC MODEL AND DEFINITION OF VARIABLES

The key dependent variable in our model was duration of visit measured in minutes of face-to-face contact between physician and patient. Time spent waiting for the physician or with other health care providers is not included in the NAMCS definition of visit duration.

We conceptualized duration of visit to be a function of 5 general influences on the patient-physician interaction. The first 4 consisted of the characteristics of patients, physicians, the practice/organizational setting in which the visit occurred, and the geographic region. Previous research[1,2] has indicated the importance of the first 3 of these influences, and region has been shown to influence

duration of other provider-patient interactions, such as length of hospital stay.[12,13]

A fifth possible influence on duration of visit included in our model was the content of the visit, as measured by diagnostic and treatment services provided. In previous multivariate analysis using the NAMCS database, Mitchell and colleagues[4] found visit content to be significantly associated with length.

Patient-related variables in our model consisted of patient age (in decades, from 18 to 29 years to older than 90 years), sex, anticipated payer (Medicare, Medicaid, private insurance, self-pay, health maintenance organization, other), race (non–Hispanic white/nonwhite), whether the patient was new to the physician, whether the patient was referred by another physician, and a case-mix adjuster.

Physician characteristics included age (by decade), specialty, and sex. Practice/organizational characteristics included the number of locations at which respondents saw patients (0 to 4 or more), whether the physician was in solo or group practice, whether the physician saw managed care patients, the proportion of the practice consisting of managed care patients, and whether the practice performed its own laboratory tests. For physicians in groups, data on the group included the number of full-time employed physicians (1 to 15, 16 to 30, >30) and the number of nonphysicians employed part-time (1 to 5, 6 to 25, 26 to 50, >50) and full time (1 to 5, 6 to 25, 26 to 50, >50). Where group physicians had more than one practice location, we included the practice characteristics for the setting at which they reported seeing the majority of their patient visits for a given week.

Geographic variables included whether the physician practiced in a standard metropolitan statistical area and the region of the country (East, Northeast, Midwest, West, South) in which the practice was located.

Visit content characteristics included whether a variety of screening, diagnostic, and therapeutic services were performed, as well as postvisit disposition. For screening and diagnostic tests, separate variables were used for the following: number of screening or preventive tests ordered or performed (including blood pressure determination, mammogram, and cholesterol check, but excluding Papanicolaou smear); the number of other diagnostic tests performed (excluding mental status examination); whether a Papanicolaou smear was done; and whether a mental status examination was done. The NAMCS provides a list of 13 diagnostic tests for the respondent to check off. The respondent can also indicate whether other tests were performed by checking an "other" category, and there is space to write in the nature of such tests. Our variable for screening or preventive tests and diagnostic tests consisted of the number of screening or preventive (0, 1, 2, or 3 or more) and diagnostic tests (0, 1, 2, 3, or 4 or more) checked off by respondents.

Other independent variables for visit content indicated provision of a variety of therapeutic services, including ambulatory surgical procedure; number of counseling services provided (consisting of family planning, diet, exercise, smoking cessation, cholesterol reduction, weight reduction, drug abuse, alcohol abuse, growth and development, family and social, and other counseling); whether psychotherapy was provided (as defined by the clinician); and the number of newly prescribed or existing medications the patient was reported to be taking (up to 5). Measures of postvisit disposition included admission to a hospital, referral to another physician, follow-up appointment scheduled, follow-up telephone appointment scheduled, and no follow-up.

Case-Mix Adjuster

The case-mix adjuster used in this study was the collapsed ambulatory diagnostic group system, a comprehensive case-mix methodology developed by Starfield and colleagues.[14-16] Each ICD-9-CM code is assigned to one of 32 ambulatory diagnostic groups. Each group is a "unique diagnostic morbidity cluster."[14] ICD-9-CM codes are assigned on the basis of 8 clinical criteria of the underlying conditions and on expected resource use.[16] Collapsed ambulatory diagnostic groups are formed by placing ambulatory diagnostic groups into 1 of 12 categories according to the likelihood of persistence or recurrence of the diagnoses within the groups.[15] Collapsed ambulatory diagnostic groups consist of the following categories: acute minor, acute major, likely to recur, asthma, chronic medical (unstable), chronic medical (stable), chronic specialty (stable), chronic specialty (unstable), eye/dental, psychosocial, prevention/administration, and pregnancy.

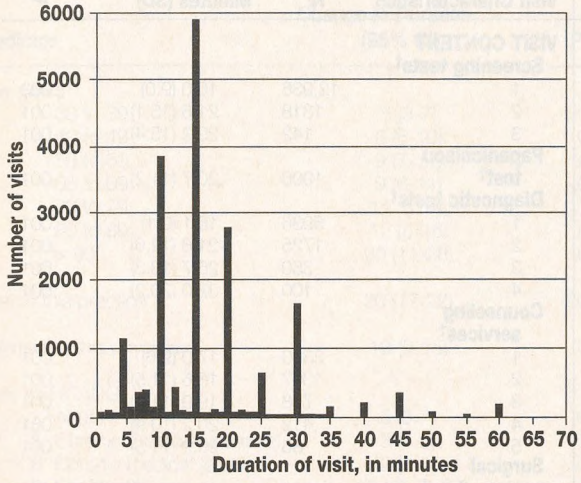
Analysis

Because of the NAMCS sampling structure, visits were clustered among the 686 physicians in our data.[17] It is postulated that durations of visits within each cluster are likely to be positively correlated. Ignoring such correlation would result in an underestimation of the standard errors of the parameters, and therefore, deflate the reported probability that differences are due to random chance. Our multivariate analysis employed a mixed-effects regression model that takes into account this correlation in our data by incorporating the physician identification number as a random effect.[18] The dependent variable (duration of visit) was transformed to the logarithmic form to compensate for its right-skewed distribution (Figure). In multivariate regressions, coefficients were considered statistically significant at the level of $P < .05$. The significance of variables was assessed using results of the t test from our mixed model. The presented P values are unadjusted for multiple comparisons, but instances are noted where the Bonferroni adjustment would alter results.[19] All presented data are weighted to reflect national patterns.

Duration of visit is by nature a continuous variable. Whether because of number preference or scheduling logistics, however, respondents may have over-reported duration of visits of certain lengths. To gain perspective

FIGURE

The frequency of ambulatory visits to primary care physicians, by duration.



on this potential source of inaccuracy, we also analyzed our data using a dichotomous dependent variable: visits shorter than or equal to 30 minutes and those longer than 30 minutes. The 30-minute cut-off was chosen arbitrarily. This approach has the effect of constraining the dependent variable to only 2 values, and thus greatly exaggerates any bias potentially introduced by the tendency of reported visit length to be grouped around a larger number of discrete values (15 minutes, 30 minutes, 45 minutes, 60 minutes, and so on). Overall, results of this logistic regression model closely resembled those from our mixed-effects regression, suggesting that our findings are not highly sensitive to specification of the dependent variable. It should also be noted that the grouping of duration of visits would tend to reduce variability in our dependent variable. This introduces a conservative bias into the analysis, which may cause us to underestimate the quantitative effect of independent variables on visit length but also increases confidence that the significance and direction of observed relationships in multivariate analyses are valid.

RESULTS

Table 1 indicates the number of primary care physicians and primary care visits by specialty in the database. Mean duration of all adult visits to primary care physicians in our sample was 16.3 minutes (standard deviation = 9.7). Table 2 shows unadjusted mean duration of visits in relation to independent variables and P values for a t test of significant differences between these means and the identified reference category.

Results of our multivariate analysis are contained in Tables 3 and 4, which indicate the estimated, independent effect on duration of visit of patient, physician, organizational/practice, geographic, and visit characteristics that significantly affected visit duration in our model. (The full model, including coefficients for both significant and insignificant variables, is available from the authors.) The model R^2 is 0.51. As our tables indicate, a large number of variables were statistically associated with duration of visit, though in some cases the quantitative effect was small. Our ability to detect such small quantitative effects reflects the large sample size (19,192 visits) we employed. One reason for displaying our results in terms of "percent change in duration" of visit is to enable readers to make their own assessment of the clinical importance of detected effects. A 2% change in visit duration (the smallest reported) translates into approximately 19 seconds, a seemingly inconsequential effect. In contrast, a 71% change (the largest detected) translates into 11 minutes, a much more clinically significant difference.

A number of patient characteristics were significantly associated with duration of visit (Table 3). Older patients, patients new to the physician's practice, patients referred by another physician, and patients in collapsed ambulatory diagnostic group 10 (psychosocial) also had significantly longer visits. Patients in groups 8 (eye/dental) and 12 (pregnancy) had significantly shorter visits (16% and 6%, respectively), as did

TABLE 1

Number of Primary Care Physicians, Visits, and Unadjusted Mean Duration of Visit by Physician Specialty Used in Analysis of 1991-1992 NAMCS Data

Specialty	Physicians in NAMCS Sample	Physician Response Rate	Visits in NAMCS Sample	Mean Duration of Visit in Minutes (SD)
Family practice	168	71*	4531	15.9 (9.0)
General practice	202	—	5531	16.1 (10.3)
Internal medicine	167	63	4826	17.2 (10.4)†
Obstetrics/gynecology	149	72	4304	15.6 (9.0)
Total	686		19,192	16.3 (9.7)

NAMCS denotes National Ambulatory Medical Care Survey; SD, standard deviation.
*Response rate for combination of family practice and general practice.
†Only the mean of internal medicine was significantly different from that of family practice.

TABLE 2

Mean Duration of Visit by Selected Characteristics

Visit Characteristics	N	Duration Minutes (SD)	P*
PATIENT CHARACTERISTICS			
Age, years			
18 to 29	3989	14.7 (8.8)	Reference
30 to 39	4148	15.6 (9.1)	.001
40 to 49	2996	16.5 (10.1)	.001
50 to 59	2269	17.2 (11.0)	.001
60 to 69	2416	17.4 (9.1)	.001
70 to 79	2223	17.4 (9.5)	.001
80 to 89	1021	17.5 (9.1)	.001
≥ 90	130	19.6 (10.6)	.001
Sex			
Female	13,409	16.2 (9.4)	.086
Male	5783	16.5 (10.3)	Reference
Ethnicity/Race			
Hispanic	1013	16.2 (9.8)	.492
Black	1663	16.4 (9.7)	.846
White	15,952	16.4 (9.7)	Reference
Asian	509	14.8 (9.2)	.001
Native American	55	15.6 (8.96)	.568
Insurance			
Medicaid	1597	15.7 (8.8)	.029
HMO	3439	15.8 (8.9)	.025
Private	5431	16.3 (10.0)	Reference
Medicare	3774	17.3 (9.9)	.001
Self-pay	3451	16.7 (10.3)	.086
Other	1500	15.3 (9.7)	.002
PHYSICIAN CHARACTERISTICS			
Age, years			
< 39	5295	15.8 (9.1)	Reference
40 to 49	6700	16.1 (9.7)	.04
50 to 59	3519	16.7 (10.1)	.001
60 to 69	2670	16.1 (9.3)	.114
> 70	1008	20.1 (12.3)	.001
Sex			
Female	2257	15.8 (9.5)	.003
Male	12,035	16.4 (9.8)	Reference
PRACTICE/ORGANIZATION CHARACTERISTICS			
Physician owns lab†	13,132	16.1 (9.5)	.001
Full-time employees†			
1 to 5	10,367	16.7 (10.1)	.002
6 to 25	5649	15.6 (9.0)	.001
26 to 50	731	16.4 (9.0)	.001
51 to 75	426	15.3 (9.4)	.001
Specialty			
OB/GYN	4304	15.6 (9.02)	.164
Family practice	4531	15.9 (9.0)	Reference
General practice	5531	16.2 (10.3)	.100
Internal medicine	4826	17.2 (10.4)	.001
GEOGRAPHIC CHARACTERISTICS			
Region			
Northeast	4532	16.1 (9.9)	Reference
Midwest	5514	16.2 (9.5)	.765
South	5403	15.9 (9.0)	.238
West	3743	17.4 (10.6)	.001
VISIT CONTENT			
Screening tests†			
1	12,936	16.0 (9.0)	.003
2	1318	21.6 (13.1)	.001
3	142	29.2 (15.4)	.001
Papanicolaou test†	1906	20.7 (11.2)	.001
Diagnostic tests†			
1	5936	16.1 (9.1)	.001
2	1725	21.6 (12.6)	.001
3	350	25.7 (13.3)	.001
4	100	32.0 (20.2)	.001
Counseling services†			
1	3360	17.0 (9.6)	.001
2	1397	18.6 (11.5)	.001
3	768	19.9 (11.0)	.001
4	412	20.2 (10.9)	.001
5	86	20.2 (11.5)	.001
Surgical procedure†	322	19.4 (12.1)	.001
Disposition telephone follow-up†	718	18.6 (10.4)	.001
Admitted to hospital†	159	20.5 (11.1)	.001
Referred to another physician†	806	18.1 (11.1)	.001
Return appointment†	11,901	16.8 (10.0)	.001
No follow-up†	1684	15.0 (9.4)	.001
Psychotherapy†	211	18.8 (10.0)	.001
New to this practice†	2275	20.4 (12.8)	.001
Referred to this physician†	496	21.8 (13.2)	.001
Number of new medications†			
1	4747	15.9 (8.8)	.001
2	1661	16.1 (10.2)	.098
3	432	16.4 (9.6)	.764
4	70	18.8 (12.4)	.041
5	17	20.7 (14.8)	.061
Case mix (CADG)			
1 Acute: minor†	5032	15.7 (9.1)	.001
2 Acute: major†	3224	17.8 (10.6)	.001
3 Likely to recur†	3755	16.2 (9.3)	.240
4 Asthma†	253	16.1 (9.3)	.672
5 Chronic medical (unstable)†	2533	18.4 (10.8)	.001
6 Chronic medical (stable)†	4636	17.7 (10.2)	.001
7 Chronic spec. (stable)†	150	17.0 (8.6)	.468
8 Eye/dental†	25	11.5 (3.8)	.006
9 Chronic spec. (unstable)†	832	15.0 (9.1)	.001
10 Psychosocial†	910	18.3 (10.2)	.001
11 Preventive/ administrative†	2535	16.8 (10.3)	.012
12 Pregnancy†	1654	14.0 (8.4)	.001

SD denotes standard deviation; HMO, health maintenance organization; CADG, collapsed ambulatory diagnostic group.
*P values show whether mean at each level is different from mean of reference level.
†Compared with no or none.

TABLE 3

Patient Characteristics Associated in Multivariate Analysis with Duration of Visit*

Predictor	Change in Duration, % (95% CI)	P
Age, years†		
30 to 39	5 (3-7)	.001
40 to 49	8 (6-10)	.001
50 to 59	9 (7-11)	.001
60 to 69	9 (6-11)	.001
70 to 79	11 (8-14)	.001
80 to 89	12 (8-16)	.001
> 90	20 (11-28)	.001
New to this practice	20 (17-22)	.001
Referred to this physician	12 (9-15)	.001
Case mix (CADG)		
2 Acute major	5 (3-7)	.001
5 Chronic medical (unstable)	3 (1-5)	.001
6 Chronic medical (stable)	2 (1-4)	.004
8 Eye/dental	-16 (-3 to -27)	.021
10 Psychosocial	9 (6-12)	.001
12 Pregnancy	-6 (-3, to -9)	.001
Insurance‡		
Health maintenance organization	-2 (0 to -4)	.025§
Medicaid	-5 (-3 to -8)	.001

*Characteristics with $P < .05$.
†Compared with 18 to 29 years.
‡Compared with private insurance.
§The P value of .025 was not significant using Bonferroni adjustment for 6 comparisons (.05/5=.010).
CI denotes confidence interval; CADG, collapsed ambulatory diagnostic group.

patients insured by health maintenance organizations and Medicaid (2% and 5%, respectively).

Table 4 contains physician, practice/organizational, geographic, and visit content variables that significantly affected duration of visit. The only physician characteristic with a significant effect was age 70 or older, which increased duration of visit by 24%.

Several practice/organizational characteristics tended to decrease visit duration. Physicians who practiced in 4 or more locations reported visit lengths that averaged 43% less than visits to physicians practicing in a single location, and those in practices with 6 to 25 full-time employees (compared with none) reported visit lengths that were 13% shorter. However, neither of these effects were statistically significant on adjustment for multiple comparisons. Physicians in practices that performed their own laboratory tests also reported shorter visit duration.

Physicians practicing in the West had visits significantly longer (11%) than those in the Northeast (the excluded variable).

The performance of 4 or more diagnostic tests (compared with no diagnostic tests) had the largest incremental effect on visit length of any variable in our regression, increasing duration of visit by 71%. Only one measure of visit content, no planned follow-up at the visit's conclusion, decreased visit length (by 8%).

DISCUSSION

Our results are consistent with a number of previous observations concerning duration of visit, challenge certain other past findings, and expand our understanding of the time requirements associated with common situations, settings, and events in ambulatory primary care practice. As in past research,[1,2] we found that patients who were older, new to a practice, and taking more medications had longer visits. We found as well that patients enrolled in health maintenance organizations have shorter visits than patients with other insurance arrangements, although this finding lost statistical significance after adjusting for multiple comparisons.[10]

Contrary to previous work,[8] however, we found that conducting more diagnostic laboratory tests and referring patients to other physicians were associated with longer, not shorter visits. The conventional wisdom holds that performing these tasks is a way to meet patients' expectations without engaging in prolonged conversation. However, these actions may be associated with other time-consuming requirements (eg, the need to explain tests to patients or the need to arrange referrals). Undetected case-mix factors may also explain the association between diagnostic testing, referral, and duration of visit.

Our research indicates that a wide range of factors affect duration of visit, and it may be possible to quantify the effects of such factors with greater precision in the future. Such improved knowledge of the determinants of duration of visits will create opportunities and highlight problems that health care systems should anticipate as they attempt to make the most efficient use of physicians' time. For instance, our findings suggest that methods of scheduling patients can be improved through an increased knowledge of the factors that affect duration of visit. In the future, information of the type reported in this paper could be used to develop software that provides more exact predictions of visit length based on patients' known characteristics. Especially as automated medical records become available, data on patient characteristics, diagnoses, and use of medication may enable more flexible and precise scheduling that not only increases physician productivity but improves patient satisfaction as well.

Our work also suggests that in designing future scheduling protocols, physicians and managers should pay special attention to the increased demands associat-

ed with certain types of patients. These include patients with advanced age, those who are new to practices, are referred by other physicians, are taking large numbers of medications, and who present with certain diagnostic problems. Further research may identify other groups of patients likely to make large demands on physician time in routine practice. To ensure these patients' access to physicians' services and to avoid disruptions in physicians' daily schedules, scheduling protocols and payment incentives should be designed to accommodate such patients. For patients who are particularly time consuming, other special arrangements, such as carve-outs, may prove desirable in some circumstances.[20,21]

Not surprisingly, the content of physician-patient interactions had a substantial effect on duration of visit in our analyses. As might be expected, the more tasks physicians undertook, the greater the time expended during patient contacts. Although we attempted to correct for case mix, the number of tests and treatments rendered may be serving in part as a proxy for severity of illness, thus making it difficult to accurately isolate the marginal effect of some physician activities.

Nevertheless, the effort to measure the incremental effect on duration of visit of conducting tests and procedures, while controlling for case mix, constitutes a potentially useful addition to understanding the dynamics of ambulatory practice. Future efforts to reduce inappropriate tests and treatments—for example, through guidelines and other decision-supports—may have the additional benefit of reducing the length of the visit, thus reducing the costs of and enhancing access to physicians' services. Alternatively, where such decision supports result in the increased use of tests and treatments that have been underprovided, managers should anticipate that the duration of physician visits may increase concomitantly. Further research on the interaction between new decision-support systems in ambulatory care and requirement for physicians' resources would seem useful at this time.

One aspect of visit content that is unlikely to be confounded by severity of

TABLE 4

Physician, Organizational/Practice, Geographic Factors, and Visit Content Characteristics Associated in Multivariate Analysis with Duration of Visit

Predictor	Change in Duration, % (95% CI)	P
Physician Characteristic		
Age >70 years*	24 (9-41)	.001
Organizational/Practice Characteristics		
Physician owns lab	-8 (-3 to -14)	.005
6 - 25 full-time employees†	-13 (-2 to -22)	.018
4 or more locations ‡	-43 (-8 to -64)	.022
Geographic Characteristics		
West§	11 (2-20)	.011
Visit Content		
Diagnostic tests†		
1	9 (7-10)	.001
2	26 (24-29)	.001
3	44 (37-50)	.001
4	71 (61-83)	.001
Papanicolaou test	34 (31-38)	.001
Surgical procedure	34 (27-41)	.001
Counseling†		
1	10 (8-11)	.001
2	14 (11-17)	.001
3	17 (13-21)	.001
4 or more	20 (11-30)	.001
Psychotherapy	14 (8-21)	.001
Screening tests† ‖		
1	3 (1-5)	.003
2	12 (9-15)	.001
3	25 (16-34)	.001
Disposition		
Return appointment	3 (2-5)	.001
Telephone follow-up	8 (4-11)	.001
No follow-up	-8 (3-14)	.001
Referred to another physician	12 (8-17)	.001
Admitted to hospital	32 (24-41)	.001
Number of new medications†		
1	5 (4-6)	.001
2	10 (7-12)	.001
3	10 (5-14)	.001
4 or more	23 (13-33)	.001

Note: The *P* value of .018 was not significant using Bonferroni adjustment for 6 comparisons (.05/6=.008). The *P* value of .022 was not significant using Bonferroni adjustment for 4 comparisons (.05/4=.013).
*Compared with age >40 years.
†Compared with none.
‡Compared with one.
§Compared with Northeast.
‖Screening tests include blood pressure check, cholesterol check, and mammogram.
CI denotes confidence interval.

illness is the provision of routine preventive screening services. Among these, Papanicolaou smears have the most marked effect, prolonging visits by an average of 34% (nearly 6 minutes). To counter tendencies to avoid such essential services, health care organizations may find it advantageous in some situations to delegate the performance of some routine screening examinations and some counseling to nonphysician personnel, such as nurse practitioners, who are trained to provide them. Alternatively, health care organizations may wish to provide financial incentives to physicians for the provision of time-consuming screening tests to counteract other incentives to skip them.

LIMITATIONS

Our study has limitations that deserve mention. Perhaps the most important is that our data pertain to the years 1991 and 1992, and changes in the health care system since that time, especially in the prevalence and types of managed care, may limit the generalizability of our findings to current practice. A particular concern is whether the increased compensation of primary care physicians on a capitated basis has already changed the duration and content of visits to such an extent that our findings are no longer relevant to the choices now facing physicians. However, capitation is still not the predominant mode of paying primary care physicians, and some commentators have begun to question whether it will become so in the near future.[22]

A second major limitation of our study, already noted, is that we cannot be sure that our case-mix adjustment has captured the full effect of case mix on the duration of visit. NAMCS data also provide no direct indicators of severity of illness.

CONCLUSIONS

Multiple factors affect duration of visit, including patient characteristics, visit content, the availability of nonphysician support, and type of insurance. Our study provides insights into the challenges facing health care organizations as they attempt to make the most efficient use of physician resources while protecting patients' access to appropriate services. The need to accomplish these purposes will remain a pressing priority for providers throughout our health care system for the foreseeable future.

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