Billing for Physician Services: A Comparison of Actual Billing with CPT Codes Assigned by Direct Observation

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BACKGROUND. Little is known about the accuracy of family physicians' use of the Current Procedural Terminology (CPT) coding scheme for office visits, despite increased administrative oversight of Medicare billing practices. In addition, the patient and visit characteristics that are associated with over- and undercoding are not well understood.

METHODS. This study compared coding for evaluation and management (E&M) services billed for 3791 visits to 138 family physicians with the codes assigned by trained research nurses using direct observation. We calculated the degree to which the codes for E&M were concordant with the observer-assigned codes. Analysis of variance and logistic regression were used to examine the association of visit and patient characteristics with discordance between billed and observer-assigned CPT codes.

RESULTS. Billing codes were concordant for 55% of encounters. Discordance was evenly distributed between under- and overcoding. Concordance of billed and observed codes was greatest for patients with indemnity insurance. Undercoding increased with longer visit length and a smaller percentage of the visit spent planning treatment. Overcoding was more common during visits with a greater percentage of time spent chatting, planning treatment, and delivering preventive services.

CONCLUSIONS. Family physicians are generally accurate in their billing procedures. The findings on patient and visit characteristics associated with over- or undercoding may be used by practicing clinicians to enhance the accuracy of their coding and billing procedures.

KEY WORDS. Insurance claim reporting; billing and coding [non-MeSH]; office visits; physicians, family. *(J Fam Pract 1998; 47:28-32.)*

In 1992, Medicare revised its payments to physicians using a resource-based relative value scale (RBRVS) approach.[1] At the same time, to ensure more consistent coding by physicians under RBRVS, the American Medical Association (AMA) adopted significant changes in how physician evaluation and management (E&M) services were defined under its Current Procedural Terminology (CPT) methodology. In addition to new E&M codes, the AMA introduced guidelines for coding these services, including the extent of history-taking and physical examination, the complexity of decision-making, and the length of time physicians spent with the patient. When implemented, there was a shift toward higher reimbursement for primary care physicians, but the shift was not as large as expected.[2] The CPT guidelines for E&M services have been further refined, and new guidelines will be used to monitor appropriate coding starting July 1998.

The majority of care provided by family physicians is for established-patient visits. Proper billing for these services has important financial and legal implications. It appears that many family physicians find it difficult to classify certain visits, and that some physicians have not fully learned the definitions and guidelines of the current coding system for E&M services.

One study of the billing practices of family physicians done before the implementation of RBRVS showed a moderate degree of variation in CPT coding of visits, especially among rural physicians.[3] When coding hypothetical case scenarios, physicians in smaller communities were more likely to use CPT codes that indicated a lower level of visit. Another study done before 1992 compared billing codes submitted for visits to academic family physicians with the office record for the visit.[4,5] There was poor agreement between the billing code used by physicians and the documentation in the medical records on the level of service and the number of diagnoses. In general, the medical records indicated that the visit should have been coded at a higher level of service than what was actually billed. Similarly, a recent structured audit at a large multispecialty group revealed generally accurate CPT coding, with the exception that longer, more complex visits, procedural and well care visits, and time spent for counseling and coordination of care were all undercoded (Sutter Medical Group, unpublished data, 1997).

Despite the limitations of the medical record in representing the content of the outpatient visit, no studies have compared directly observed office visits with physician-

assigned billing codes. Our study compared actual E&M billing codes used by family physicians with codes assigned by a trained nurse directly observing the same patient encounters. The discordance between these two codes for the same visit was examined for its relationship to patient and visit characteristics.

METHODS

Our study was part of the larger Direct Observation of Primary Care (DOPC) study, which examined the content of 4454 outpatient visits to family physicians in northeast Ohio. The methods of the DOPC study have been described in detail elsewhere.[6,7] Briefly, research nurses directly observed consecutive patient visits to participating physicians between October 1994 and August 1995. Patients were informed about the study in the waiting room before meeting with their physicians, and were enrolled if they gave verbal informed consent. The sample for this study was restricted to established patients for whom billing data were available.

DATA COLLECTION

The research nurses collected data on the content and context of consecutive office visits using direct observation of the encounter, patient exit questionnaires, and medical record review. Physician characteristics were assessed by questionnaires completed by the physicians following their participation in the study. Billing data on CPT codes and ICD-9-CM diagnoses for the observed visits were obtained from the office staff on a day subsequent to each observation day.

CPT codes were assigned by the research nurses to each visit, based on direct observation using established guidelines.[8] Research nurses were trained in E&M coding using the methodology in *CPT '94 Clinical Examples Supplement*[9] to enhance validity and interrater reliability. Interrater reliability was high ($\kappa=.79$) among the eight research nurses assessing the billing codes on the basis of direct observation.[6]

MEASURES

The main outcome measure for the study was the degree of concordance between the actual billing codes and the billing codes assigned by the research nurses. The E&M codes, ranging from 99211 to 99215, were rank-ordered from 1 to 5, respectively. A difference score was created to reflect the difference in rank-ordering between the actual E&M code billed for the visit and the nurse-assigned E&M code. Negative difference scores were indicative of underbilling; positive scores indicated overbilling. For analyses of factors associated with billing accuracy, a three-category variable was created: undercoded, concordant, and overcoded.

Data on patient characteristics including age, the duration of physician-patient relationship, and the number of visits to the practice in the previous year were obtained from the medical record. Sex and race (white vs nonwhite) were assessed by direct observation by the research nurse. Health status, measured using a modified version[6] of the Medical Outcomes Study (MOS) 6-item General Health Survey,[10] and education level attained (high school graduate or less vs greater than high school graduate) were both determined from the patient exit questionnaire. The usual provider continuity, which has been used as a simple measure of continuity of care,[11] was calculated using the total number of visits in the past year and the total number of visits to the index physician[12] as measured by the patient exit questionnaire. Patients' insurance status was established from billing data, and corroborated by patient report on the exit questionnaire, when available.

All the visit characteristics examined in the study were measured by direct observation. They included the length of visit, reason for visit (categorized as acute illness, chronic illness, or well care), presence of a medical student, presence of another family member, and discussion of another family member's problem. The research nurse also recorded whether a drug was prescribed, a referral was made, the patient requested preventive services, the patient requested help with behavior change, and whether emotional issues were raised by the patient. In addition, time use by physicians during patient visits was measured using the Davis Observation Code, which categorizes time use during every 15-second interval into 20 different behavioral categories.[13]

ANALYSES

Descriptive statistics on characteristics of the patients, visits, and physicians were calculated to determine if patient and visit characteristics were associated with the degree of concordance between the actual billing and the billing based on direct observation. Chi-square tests were used for categorical independent variables, and analysis of variance (ANOVA) was used for continuous independent variables.

All significant patient and visit characteristics were entered into two backward elimination logistic regression analyses. The first logistic regression analysis compared undercoding with concordant coding; the second analysis compared overcoding with concordant coding. These analyses were performed to identify characteristics of patients and visits descriptive of over- and undercoding.

RESULTS

Of the 4454 total patient visits observed for the larger study, we excluded 381 visits by new patients and 282 visits by established patients without billing data. The 3791 visits by established patients with complete billing information constitute the sample for this study. Characteristics of the patient sample are listed in Table 1.

Characteristics of the physician sample have been

described elsewhere[6,7] and are similar to the demographics of physician members of the American Academy of Family Physicians. The physician sample slightly overrepresented female and residency-trained physicians, which reflects recent trends in the characteristics of family physicians.[14]

The outcome of discordance between the actual billing and the billing based on direct observation ranged from -3 to +3, and was evenly distributed between underbilling and overbilling. The actual billing code and the direct observation billing code were concordant for 55% of patient visits, and differed by more than 1 code in less than 4% of encounters.

The only patient factor associated with billing accuracy was a tendency of patients with traditional indemnity insurance to be billed more accurately (Table 1). Among visit characteristics examined, the most accurate billing was for acute visits and visits in which drugs were prescribed (Table 2). The least accurate billing was for visits that included time spent providing preventive services and visits in which the patient raised emotional issues or requested help with a behavior change. Underbilling was more common for visits by children, longer visits, visits involving greater amounts of time spent in counseling or negotiation, and visits resulting in a referral. Overbilling was observed in visits with more time spent chatting or planning treatment, visits in which the patient requested preventive services, and visits during which a medical student was present.

The results of the logistic regression analysis of patient and visit characteristics independently associated with undercoding are presented in Table 3. The strongest discriminating item is visit length with longer visits more likely to be undercoded. Visits involving more time spent planning treatment and patients having traditional indemnity insurance were less likely to be associated with undercoding.

The patient and visit characteristics independently associated with overcoding are listed in Table 4. Overbilling was more common in visits with more time spent chatting, planning treatment, or providing preventive services. The presence of a medical student and visits for well care were also associated with overbilling. Variables independently associated with less overcoding include patients with traditional indemnity insurance, shorter visits, and visits in which a referral was made or drugs were prescribed. Analysis of the distribution of over-

TABLE 1				
Patient Characteristics Associated with Discordance Between Actual Billing and Billing Codes Determined by Direct Observation of Patient Encounters (N=3791)				
	Undercoded (n=784)	Concordant (n=2102)	Overcoded (n=905)	P
Age (mean years)	42.1	42.3	41.9	.916
Sex (% female)	63.2	61.5	62.9	.636
Race (% nonwhite)	11.9	11.8	10.8	.722
Education* (% >high school)	48.3	48.8	46.6	.692
Health status (1=poor, 5=excellent)	3.7	3.7	3.8	.161
Insurance				
Fee for service	18.1	22.0	16.2	.008
Managed care	34.9	34.9	37.0	
Medicare	24.3	23.6	24.7	
Medicaid	7.9	6.9	6.4	
Other	14.8	12.5	15.7	
No. of years with practice	2.6	2.8	2.9	.083
No. of visits in last year to practice	4.6	4.7	4.5	.302
Physician's knowledge of patient	3.6	3.6	3.5	.431
Patient report of coordination of care	4.0	3.9	3.9	.571
Usual provider continuity of care	0.7	0.7	0.7	.318

* Only applicable to patients 18 and older.

and undercoding by physicians showed a normal distribution, indicating that errors were not the result of certain physicians systematically miscoding.

DISCUSSION

Family physicians in this study were generally accurate in their office billing practices, as measured by comparing their E&M billing codes with codes assigned by a trained nurse-observer using explicit CPT coding criteria. Major discrepancies between the trained observer and the physician were uncommon. Over- and undercoding for visits occurred with equal frequency. Patient variables such as sex, race, education, and health status were not significantly associated with coding discrepancy. Likewise, continuity of the physician-patient relationship, frequency of visits, or familiarity of physician with patient also did not affect coding behavior.

The association of presence of a medical student with overcoding likely results from the student obtaining medical history information that was shared with the physician outside the examination room, and thus not apparent to the nurse-observer. Only 84 visits (2.2%) in the study involved the presence of a student, but these visits did involve less time spent by the physician obtaining medical history information.[15]

Physicians tended to undervalue their provision of extended time with the patient, and undervalued time spent on negotiation. This finding is similar to the study by Horner et al[4] and to the unpublished data from the Sutter Medical Group. This consistent trend may be due to a num-

TABLE 2

Visit Characteristics Associated with Discordance Between Actual Billing and Billing Codes Determined by Direct Observation of Patient Encoubnters (N=3791)

	Undercoded (n=784)	Concordant (n=2102)	Overcoded (n=905)	P
Reason for visit				
Acute	54.8	60.4	58.3	.037
Chronic	25.9	25.5	23.7	
Well care	12.9	9.1	10.5	
Other	6.4	5.0	5.7	
Visit length (min)	11.4	9.7	8.6	<.001†
Time use (mean % time intervals)*				
Chatting	7.4	7.6	8.7	.004†
Counseling	2.2	1.6	1.3	.001†
Negotiation	1.4	1.2	1.0	<.001†
Preventive services	3.2	2.6	3.3	.005†
Planning treatment	30.6	32.6	34.6	<.001†
Medical student present	0.9	1.4	2.9	.002
Referral	12.5	10.3	8.1	.011
Patient requests behavior change help	3.9	2.2	5.0	.009
Patient requests other prevention	2.5	3.0	5.7	.012
Patient raises emotional issues	13.4	8.6	13.3	.003
Other family member present	32.7	31.7	30.5	.618
Family member's problems discussed	18.6	17.4	18.7	.608
Drug prescribed	61.3	65.7	62.3	.043

*Assessed using the Davis Observation Code.

†Because of violations in the homogeneity of variance assumption, means compared using Kruskal-Wallis one-way analysis of variance.

becoming important to family physicians for legal as well as financial reasons. Accurate utilization of CPT coding will be particularly important because the Health Care Financing Administration will be conducting prepayment reviews of E&M coding practices using recently revised CPT documentation guidelines.[17] These reviews will focus on overcoding, and may not recognize that an equal amount of undercoding is also occurring.

Third-party payers should recognize that primary care physicians are often delivering more care than indicated by their billing or CPT coding. In particular, the time spent providing counseling and referral services tend to be underbilled by family physicians. As physicians become more familiar with new coding requirements, the apparent rise in billing may be perceived as upcoding, rather than as a correction of previously improper coding. Financial budgeting needs to anticipate this correction in billing. In capitated environments proper coding is imperative. Proper coding can generate an accurate analysis of work effort and help ensure equitable distribution of health care revenue.

For services reimbursed under traditional indemnity insurance, using appropriate coding for office visits may result in better reimbursement from third party payers. For those involved in capitated arrangements, correct coding will accurately record true utilization management, laying the foundation for proper contract negotiation with

ber of factors. Physicians may get engrossed in their work and significantly underestimate the actual time they spent with their patient. An independent observer may recognize that more time was spent during an encounter than usual, but physicians themselves may feel that they were inefficient or that there was insufficient justification for spending so much time, and thus be reluctant to code for the extra time at a higher level of visit. More research into the dynamics behind this finding is warranted.

There was a small but statistically significant tendency to both overcode and undercode patients with managed care and Medicare insurance compared with patients with traditional indemnity insurance. At the time of this study, managed care had less than 20% penetration in the commercial insurance market of northeast Ohio, and there were no Medicare risk contracts in the area.[16] Family physicians were predominantly paid on a fee-for-service basis for managed care patients. To compensate for the lower reimbursement rates per visit from Medicare or managed care contracts, physicians may have had a tendency to "upcode." There was, however, an equal percentage of visits that were undercoded. More research is needed to replicate this finding and to understand its causes.

Learning and understanding CPT coding is

TABLE 3

Patient and Visit Characteristics Independently Associated with Undercoding

	OR	95% CI	P
Visit length*	1.05	(1.03, 1.07)	<.001
Fee-for-service insurance	0.80	(0.64, 1.00)	.046
% time spent planning treatment†	0.94	(0.89, 1.00)	.047

* OR represents change in odds with every minute increase in visit length.

† OR represents change in odds with every 10% increase in time spent.

managed care plans. In addition, provision of care to a family member is a relatively common occurrence during visits to family physicians and is not reflected in current CPT coding.[18] Coding options to reflect and reimburse for unaccounted care to family members by family physicians should be considered by third-party payers.

This study is limited to E&M coding, and did not evaluate the use of the 993 series of preventive medicine services codes. The trained nurse-observers were not instructed to assign 993-series codes when the principal reason for visit was well care. The physicians involved in the study seldom used these codes even though they are clearly delineated in the CPT manual. It is apparent that the study physicians did not consistently recognize preventive care or counseling with accurate CPT coding. At the time of the study, payers were just beginning to recognize and reimburse for 993-series codes. Thus, underuse of preventive services codes by family physicians may represent an attempt to minimize patient billing for uncovered preventive services by billing on the basis of illnesses cared for during the course of well care. Also, since we did not examine procedural codes, we cannot comment on whether the study physicians were advantaged or disadvantaged by their procedural coding practices. The physicians participating in this study were volunteers who allowed nurses to come into their offices to directly observe actual patient encounters. Although these physicians were similar demographically to family physicians nationally, it is possible that these volunteers are a self-selected group who code more accurately than nonvolunteers. The physicians in this study were from a single state, so variations in practice across geographic areas were not identified.

Overall, the study findings show generally accurate billing practices by community family physicians. Understanding the characteristics of visits associated with under- and overbilling can be used by physicians to enhance their ability to accurately code and bill for all types of visits. This increased accuracy of billing will help physicians to withstand external scrutiny of overbilling by third-party payers, and to increase reimbursement for types of visits that tend to be undervalued in current billing practices.

ACKNOWLEDGMENTS

TABLE 4

Patient and Visit Characteristics Independently Associated with Overcoding

	OR	95% CI	P
Fee-for-service insurance	0.66	(0.53, 0.82)	<.001
Visit length*	0.95	(0.94, 0.97)	<.001
% time spent planning treatment†	1.10	(1.01, 1.19)	<.001
% time spent on preventive services†	1.21	(1.06, 1.39)	.006
Medical student present	2.21	(1.26, 1.39)	.006
% time spent chatting†	1.11	(1.05, 1.17)	.022
Visits for well care	1.40	(1.03, 1.91)	.029
Referral made	0.73	(0.54, 0.99)	.043
Drug prescribed	0.84	(0.70, 1.00)	.047

* OR represents change in odds with every minute increase in visit length.

† OR represents change in odds with every 10% increase of time spent.

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