Variation in Office-Based Quality

A Claims-Based Profile of Care Provided to Medicare Patients With Diabetes

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Objectives.—To demonstrate that claims data "profiling" can be used as an ongoing method to support ambulatory care quality improvement; to measure the quality of office-based care provided to elderly patients with diabetes in three states; and to identify factors associated with better attainment of quality standards.

Study Design.—A cross-sectional study based on a 100% sample of the Medicare claims (Part B and Part A) submitted between July 1, 1990, and June 30, 1991.

Setting.—All primary care practices (both solo and group) actively seeing Medicare patients with diabetes in Alabama, Iowa, and Maryland (n=2980).

Patients.—All elderly (≥65 years) Medicare patients seen by the study physicians and assigned a diagnosis of diabetes (n=97 388) by any office-based physician during the year.

Main Outcome Measures.—The proportion of patients with diabetes receiving the following procedures (from any provider) at least once during the study period: hemoglobin A_{1C} measurement, ophthalmologic examination, total cholesterol measurement, and blood glucose measurement. We considered the first three services to be optimally recommended and blood glucose measurement to be of limited use.

Results.—Based on analyses of services provided in the ambulatory setting, we found that 84% of diabetics did not appear to receive the recommended hemoglobin A_{1C} measurement, 54% did not see an ophthalmologist, and 45% received no cholesterol screening. Practice patterns varied considerably across the three states (up to 2.38-fold), even after adjusting for patient case mix and physician characteristics. Patients of general practitioners were less likely to meet recommended quality criteria than patients of internists or family practitioners. Patients receiving care from rural practitioners were less likely to receive services, either recommended or not, than those in urban locations.

Conclusions.—Elderly patients with diabetes do not appear to be receiving optimal care. This study underscores the value of practice guideline development and dissemination in the ambulatory arena. This study provides substantial evidence that existing administrative claims data can be used to support ambulatory quality improvement activities.

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PAYERS and society are holding US physicians to an increasing degree of accountability, particularly in terms of the cost-effectiveness and the quality of care they provide. Until recently, this type of scrutiny has been limited mainly to services provided within hospitals. However, the focus of this attention is shifting to the ambulatory sector, now that expenditures for nonhospital care eclipse those spent on institutional services for many insured populations.[1]

Monitoring quality in the ambulatory sector is a daunting task, because the volume of services provided is huge. This year, about 80% of Americans will contact physicians in their offices or clinics, making a total of about 1250 million visits. In comparison, only about 8% of Americans will be hospitalized, for a total of about 28 million admissions.[2] Moreover, unlike the well-developed quality assurance infrastructure found in US hospitals, outside of a number of health maintenance organizations, no similar infrastructure exists in the ambulatory setting.

For editorial comment see p 1534.

Many influential parties have called for the development of quality monitoring and improvement activities emphasizing primary care.[3-6] But this will require new tools and methods. Also, data sources in ambulatory care are sparse and untested. Until recently, no automated data were routinely available within office-based settings, and study-specific data—obtained from medical records or patient surveys—are expensive, particularly relative to the cost of the services being investigated.

As is the case with other payers, pressures are mounting within the Medicare program to better evaluate and monitor the approximately $40 billion it spends on care annually in ambulatory-based settings.[1] To better accomplish this task, Medicare recently upgraded its computerized claims transaction system. This system—the world's largest—documents the basic patterns of ambulatory care received by a cohort of approximately 35 million patients. Furthermore, the Health Care Financing Administration's (HCFA's) billing forms—the so-called HCFA 1500 and UB 82/92—have become the standard of the private insurance industry. They are expected to serve as the core of a uniform electronic claims form in the near future.

Medicare claims data represent a tremendous resource for assessing and improving the quality of care provided by US physicians in their offices. These claims data provide a "magnetic trail" that documents nearly all services provided to all elderly patients by all types of providers.

Claims data can be used to measure many aspects of care quality, including both process and outcome, but most agree that they are best suited to profiling patterns of care across provider or patient groupings to assess the attainment of

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practice guidelines.[7-10] Once claims data are obtained for their primary purpose—paying the provider—they are inexpensive and unobtrusive to apply for quality monitoring or improvement analyses.

This article has three objectives: (1) To demonstrate that claims data "profiling" can be used as an ongoing method to support ambulatory care quality improvement; (2) to measure the quality of office-based care provided to Medicare patients with diabetes; and (3) to identify physician- and geographic-related factors associated with higher or lower conformance to recommended criteria of care.

METHODS

Data Sources and Populations

The main source of data was Medicare claims for services provided to aged beneficiaries residing in Alabama, Iowa, and Maryland during the 12-month period from July 1990 through June 1991. We used HCFA's new database, known as the National Claims History File, which includes 100% of all Part B (physician) office claims submitted on behalf of every Medicare beneficiary in the nation. The National Claims History File includes diagnostic codes (*International Classification of Diseases, Ninth Revision, Clinical Modification* [*ICD9-CM*]) for office-based care.

Using HCFA's eligibility files, we identified the entire cohort of aged (≥65 years) Medicare beneficiaries enrolled during the study period (or who died within it) and who resided (according to the Social Security Administration) continuously in one of the three study states. Patients in nursing homes for more than 2 months were excluded from the study. One hundred percent of Part A (institutional) and Part B (physician and other "supplier") Medicare claims were obtained for the study population without regard to where the services were provided. Although Part A hospital claims did indicate that a hospitalization occurred, other than major surgery, the specific services rolled into the hospital's diagnosis related group inpatient payment were not documented in the claim.

Assigning a Primary Care Source

Assessing quality of care at the primary care practice level was the goal of the demonstration project from which this study was derived.[11,12] Therefore, we assigned all Medicare patients to what we termed their "primary care source." We defined a primary care source as the primary care (general practice, family practice, and general internal medicine) physician (or group) who provided more face-to-face office/clinic visits to a beneficiary during the study year than any other primary provider. Ties—which occurred less than 6% of the time—were broken by assigning the patient to the primary care practice providing more intensive services (as characterized by the relative value of visits and procedures provided). The patients thus assigned received 86.5% of all primary care visits directly from their primary care source and 59.3% of all ambulatory care visits (primary and specialty care combined) from this source. To be included in this study, a practice had to be designated as the primary care source for at least 25 Medicare patients and located within the geographic boundaries of one of the three states for the entire study period.

Across the three states, more than 70% of the Medicare beneficiaries who used any service during the year could be assigned to an in-scope primary care source (n=818 193). Beneficiaries went unassigned because they made no ambulatory visits (about 10% of all users); made visits only to specialists, multispecialty groups dominated by specialists, or physicians with unknown specialties (about 15% of users); or they only visited a primary care source not meeting the above criteria (about 5%).

Within the cohort of patients assigned to a primary care source, we used the claims transaction data to identify persons who had been diagnosed in the office setting (by any physician of any specialty) with a primary diagnosis of diabetes (n=97 388). Approximately 13.4% of the overall population was diagnosed with this condition (15.4% in Alabama, 12.2% in Iowa, 12.7% in Maryland).

For the analysis reported herein, we included only practices providing services to one or more patients with this in-scope diagnosis. Across the three states, this included 2980 practices. Of these, 25% were group practices (serving approximately 50% of all patients). From the unique physician tax identification numbers associated with these 2980 practices, we estimate that a total of 10 000 individual primary care physicians were involved in the provision of care to our study's patient cohort. (The Uniform Provider Identification Number system was not fully in place during this time period.) On average, each practice included in the study was the primary care source for approximately 35 patients with diabetes. A practice-specific database was constructed as follows: 100% of the Part A and Part B claims submitted for services provided to in-scope patients during the 12-month study period were obtained and summarized regardless of the diagnosis noted on the claim. Next, these patient-specific records were aggregated by primary care source. Finally, we merged provider files obtained from the Medicare-contracting carriers in the three states containing information such as self-designated primary specialty and ZIP code of the main practice site.

The clinical unit of analysis of this study was the individual primary care practice. But the conceptual focus was the larger physician community within which these practices were located. We took this approach for two important reasons. First, because of the relatively small number of patients with diabetes per practice, the results for individual physicians or groups are likely to be statistically unstable. Second, the goal of the larger quality improvement development effort from which this study was derived was to support regional-level educational intervention.

Study Variables and Measures

We worked closely with the Medicare-designated Peer Review Organization in each state and with local and national physician organizations. These groups helped us to identify a series of quality indicators relevant to primary care that could be reliably found in HCFA's claims data files.[11-13] Based on then current national guidelines available in 1992 and input from clinician panels in each state, a set of quality indicators was identified. These measures were divided into two categories: recommended services/procedures that were considered as a general standard of care for all patients and limited-use services and procedures that were suggested for patients only in certain circumstances.

The following four services/procedures were identified as quality indicators for diabetes; cited are the key references used to select and define each of these indicators. Aggregated at the practice level, the services/procedures served as the dependent (outcome) measures for this analysis. The recommended procedures (which should be performed at least once during the year) are hemoglobin A_{1C} (glycosylated hemoglobin) measurement,[14,15] ophthalmologic examination,[14-17] and total cholesterol measurement.[14-16] The limited-use procedure (which should be done only in certain circumstances) is blood glucose measurement.[14-16]

A service was counted in the performance rate if for a patient any provider in the country—not just the primary care source—submitted at least one claim for this service to Medicare during the 12-performed alone or as part of a multitest month period. The service could have been battery. A listing of the Current Procedural Terminology codes that were included in the definition of each service/procedure are available elsewhere[11,13]

Again, the three recommended services were considered as indicators of attainment of desirable care. If they were not received by a patient during the period,

Table 1.—Characteristics of Medicare Patients With Diabetes by State

	Alabama	Iowa	Maryland
No. of patients	37 479	29 913	29 996
Total No. of practices serving patients	845	818	1317
No. of patients per practice, mean (SD)	44.4 (50.6)	36.6 (41.9)	22.8 (22.7)
Female, %	65.6	59.0	60.2
Age, %			
65-74 y	51.8	53.6	56.5
75-84 y	39.1	40.9	36.2
≥85 y	9.1	12.7	7.3
Burden of patient illnesses, %*			
1 medical condition	5.1	4.7	9.6
2-3 medical conditions	24.5	22.3	33.5
4-5 medical conditions	28.9	26.7	28.6
6-9 medical conditions	33.7	35.9	24.1
≥10 medical conditions	7.8	10.4	4.1

*No. of unique types of ambulatory diagnostic group morbidities based on ambulatory care group case-mix system.[18,19]

published guidelines state that in the absence of extenuating circumstances, the patient can be considered to be receiving care that is suboptimal. The limited-use indicator was not considered as a direct measure of good or bad care, but rather as a measure relevant to understanding general patterns of primary care. Although ordering or providing a limited-use service does not imply substandard care, it was the premise of our clinician panels that the uniform application of these procedures for every patient as a matter of routine could be considered inappropriate and inefficient.

A series of independent (explanatory) variables describing the physician's practice were incorporated into this analysis. These included the following:

Physician Specialty.—As described herein, each primary care source practice was categorized based on the self-designated specialty of the physicians participating in the practice, as reported to the Medicare carrier (Blue Cross–Blue Shield) in each state. The specialty categories included family practice, general practice, and general internal medicine. When primary care physicians represented the majority of practitioners in a multispecialty practice, we designated this a "multispecialty group primary care source." However, patients assigned to multispecialty group practices in which primary care physicians were outnumbered by specialists were excluded from this analysis. Single-specialty physician practices could be a solo practice, a partnership, or a single-specialty group. About 87% of the single-specialty practices in Alabama and Maryland and 76% in Iowa were solo practices.

Location of Practice.—Metropolitan and rural practices were described as a yes/no dichotomous variable. This distinction is based on whether the ZIP code of the practice's main site was located in a federally designated metropolitan statistical area or a rural county. The second location variable is the state.

Patient-related factors could influence a physician's pattern of practice, so we developed measures describing the patient panel treated by each primary care source as follows:

Patient Demographics.—From data in HCFA's beneficiary file, we calculated the proportion of diabetic patients of each sex and the proportion aged 65 to 74 years, 75 to 84 years, and 85 years and older.

Patient Comorbidity.—Using the diagnostic information provided by all physicians on their visit claims during the study period, we determined the number of unique types of conditions for which each patient received treatment. These morbidity categories (known as ambulatory diagnostic groups [ADGs]) were used to help control for potential differences in case mix across the practices. These categories are a component of the Johns Hopkins ambulatory care group (ACG) case-mix classification system.[18,19] Without regard to organ system, the ACG system groups clinically similar conditions (eg, self-limited acute or unstable chronic) into the same ADG cluster. The ADGs are based only on *ICD9-CM* codes assigned during the year. The number of visits or types of procedures performed does not affect the categorization; therefore, the measure is relatively independent of the intensity of services provided. The total number of these clusters was considered indicative of a patient's burden of illness and thus the complexity of managing the patient. The proportion of study patients within the practice in each of five "number of condition" categories (based on number of ADGs) was included in the model as a general measure of the practice's case mix, although the number of conditions variable does not directly measure the severity of the patient's diabetes. It should be noted, however, that the number of conditions are an indirect measure of severity, given that most of the complications of diabetes (eg, ketoacidosis or peripheral vascular disease) are categorized into ADG clusters that are distinct from the primary condition.

Statistical and Analytic Approaches

We used indirect regression adjustment to hold other factors constant while we assessed the relationship between physician, geographic, or practice characteristics and the proportion of a primary care source's diabetic patients receiving the procedure of interest.

We used linear regression (ordinary least squares [OLS]) models to develop adjusted service use statistics for each independent variable stratification. The regression-adjusted values provide estimates of the relationship between a single independent variable of interest (eg, state of practice) and a dependent measure (eg, percentage of patients receiving one or more hemoglobin A_{1C} test) when other variables are held constant (eg, specialty, patient case mix, and urban/rural mix). Thus, indirect adjustment was accomplished by calculating expected service use rates, based on the assumption that all practices in the study had the single characteristic of interest, but that all other characteristics were set to the overall three-state population average.

We tested the use of an arc-sine transformation and found that the OLS estimates were more precise. Also, because of concerns over "left-censored data" (where missing observations are assigned a value of zero), we completed a TOBIT analysis.[20] Specifically, we performed a sensitivity analysis for hemoglobin A_{1C} measurements, where the censoring problem was the greatest. A comparison of the results of the TOBIT and OLS analyses indicated that the approximate magnitude and signs of all of the parameters were the same.

RESULTS

Patient and Practice Characteristics

Table 1 describes the characteristics of the 97 388 patients receiving care from an office-based primary care physician for diabetes. For each state, Table 1 presents patient characteristics and Table 2 presents practice characteristics.

Diabetes Care and Its Variation

Across all three states, only 16.3% of patients with diabetes received a hemoglobin A_{1C} measurement, 45.9% received an ophthalmologic examination, and 55.1% received a total cholesterol measurement annually (Table 3, row 1). For each stratifying variable, Table 3 presents the adjusted proportion of patients with diabetes receiving each service at least once during the year (from any provider in the country), adjusting for patient age, sex, disease burden, and the

stratifying variables that are not the subject of the analysis.

For every practice indicator–state combination except ophthalmologic examinations in Maryland and Iowa, there is a statistically significant variation across the three areas. The variation can be characterized by an adjusted relative risk ratio between the state with the highest service use rate vs the state with the lowest service use rate.[21] For example, the Maryland-to-Alabama ratio for hemoglobin A_{1C} measurement is 2.38 (ie, 21.9 divided by 9.2), indicating a 238% difference across the regions.

Table 3 also presents regression-adjusted use rates across four specialties. To isolate the effect of specialty on patterns of practice, the effect of region is held constant. For most indicators, the impact of specialty is not uniformly large. The cross-specialty differences are greatest for hemoglobin A_{1C} measurement, with a high-to-low specialty ratio between family practice vs general practice of 1.72. For the other indicators, the relative risk ratios are no greater than 1.15.

With the exception of ophthalmologic examinations, rates of procedures are significantly lower in rural areas (Table 3).

Table 2.—Characteristics of Primary Care Physician Practices in Each State

	Alabama	Iowa	Maryland
No. of practices*	845	818	1317
Mean No. of Medicare patients per practice†	285	299	178
Physicians in each specialty, %			
Family practice‡	31.5	33.5	18.7
General practice‡	20.5	25.9	9.8
Internal medicine‡	33.3	22.7	59.4
Multispecialty group§	14.7	17.8	12.1
Urban location, %	63.5	43.7	89.7

*Serving at least 25 Medicare patients (not limited to diabetes).
†Only patients using these practices as the "primary care source" (see text). Includes patients with all medical conditions.
‡Includes both solo practices and single-specialty group practices.
§Multispecialty, but where primary care physicians are in majority.

Table 3.—Services to Patients With Diabetes by State, Specialty, and Geographic Location*

	Recommended Use, %			Limited Use, %
Stratifying Characteristic	Hemoglobin A_{1C} Measurement	Ophthalmologic Examination	Cholesterol Measurement	Blood Glucose Measurement
Entire sample (unadjusted)	16.3	45.9	55.1	80.5
State				
Alabama	9.2†	37.1†	54.7†	88.2†
Iowa	14.3‡	50.5‡	46.4‡	73.1‡
Maryland	21.9†	48.7	60.8†	80.2†
Specialty				
Family practice	18.6	44.5†	56.4	84.0†
General practice	10.8†	45.1§	49.8†	78.9
Internal medicine	16.7‡	47.8‡	57.5‡	79.9‡
Multispecialty	17.2	44.1†	51.9†	77.9
Location				
Urban	17.2†	45.9	58.1†	81.6†
Rural	14.5‡	45.8‡	48.4‡	78.1‡

*Unless otherwise noted, figures represent the adjusted proportion of patients with diabetes who had the specified service at least once during the year from any source. Using indirect regression adjustment, the following characteristics have been held constant, as appropriate: state, specialty, patient age and sex, patient disease burden, and urban/rural location.
†P=.001, based on significance of independent variable in linear regression equation.
‡Indicates reference category.
§P=.01, based on significance of independent variable in linear regression equation.

COMMENT

Among the entire cohort of physicians studied, there is considerable opportunity for improvement in office-based quality of care. A significant proportion of patients receiving care during our study period (July 1990 through June 1991) do not appear to be receiving care according to the American Diabetes Association guidelines published in May 1989.[15] For example, among diabetics, 84% of patients did not receive a hemoglobin A_{1C} measurement during the year, even though guidelines suggest that twice a year is optimal.[15] For the other two recommended indicators (ophthalmologic examinations and cholesterol measurement) 45% to 54% of patients did not appear to be receiving desired services.

The large proportion of diabetic patients receiving the blood glucose test suggests that some patients may be receiving unneeded care. It should be acknowledged once more, however, that receipt of a limited-use service alone cannot be considered evidence that quality is suboptimal, as some patients will require these services. For example, although controversial among diabetes care experts, tight control can be obtained with blood glucose monitoring in the absence of a hemoglobin A_{1C} test. While a determination of the appropriate levels of limited-use services requires further study, our findings underscore the need for additional assessment of the effectiveness of diagnostic testing within the office-based setting.

In almost all instances, practice patterns varied significantly across the three states, even after controlling for practice and patient characteristics. Some interesting cross-region trends are suggested. For blood glucose measurement, the limited-use procedure, the Iowa practice rate was significantly lower than the other two states. Also, Alabama practices were generally less likely to order the recommended services for diabetes. Maryland physicians, who were mostly internists and practice in urban areas, were generally more likely than physicians in the other states to order the recommended tests.

Although the differences are not always large, patients receiving care from rural practitioners were less likely to receive services, either recommended or not, than those in urban locations. This might be due more to decreased geographic access than physician practice style.

Limitations

Five limitations of this study should be acknowledged.

Generalizability.—This analysis was limited only to physicians providing services to Medicare beneficiaries in three states. Although the observed patterns of practice are generally consistent across these diverse regions, the situation in other states may not be comparable.

The analysis reported herein is part of a larger study that focused on quality measurement and improvement among primary care physicians. Therefore, excluded from the study cohort were the 10% to 15% of ambulatory patients in each state who were treated only by specialists or multispecialty groups dominated by specialists. The patterns of care received by patients with diabetes in this subset are likely to be different from the larger patient cohort treated by generalists only, or by generalists in combination with specialists, as was reported herein.

Severity Adjustment.—The ACG case-mix system has been shown to explain a considerable proportion of variation in patterns of treatment within cohorts of chronically ill patients.[22] However, even though it appears to be a useful measure of comorbidity, the ACG method does not represent a complete measure of all potential differences in severity within a cohort of diabetic patients. Moreover, patterns of diagnosis coding or documentation could vary systematically across region or other units of analysis. Therefore, true differences in severity could represent one unmeasured source of variation. Mitigating this concern is this study's focus on process measures, where it can be argued that severity/case-mix adjustment is less critical than for outcome measures.

Self-designated Specialty.—This study used physicians' self-designated specialty information as reported to the Medicare carrier in each state. This designation might lead to some degree of misclassification, when compared with a specialty categorization based on board certification or eligibility. The self-designated label, however, is the measurement approach used by most studies, national physician workforce planners, and the American Medical Association.

Accuracy of Claims Data.—Because claims data are the main source of information for this study, reliability errors could pose a threat to the study's internal or external validity. To better assess errors intrinsic to the Medicare claims database, we performed an extensive comparison of the claims data at one of our study sites (Maryland), with 1927 charts abstracted from 91 volunteer office-based physicians. Moreover, as part of the broader study, we used the Maryland charts and a sample of charts from the two other sites (n=1097 in Iowa and n=1789 in Alabama) to develop patterns of practice estimates for many of the same indicators as reported herein. The results of both the claims-to-chart comparison and the stand-alone chart results are reported elsewhere in detail.[11,23,24] Overall, however, the chart/claims comparison and the general chart-derived findings help us to characterize the accuracy of the claims data used by this study.

A comparison of the diagnoses noted by physicians on their claims to evidence of the conditions in their charts[11] suggested that the claims-based diagnoses had a specificity of greater than 0.90. This means that within the sampled charts, when the claims were used to designate the patient as having a condition, the chart verified this more than 90% of the time.

Nurses from the Peer Review Organization searched the 1927 randomly selected Maryland primary care physician charts on a blinded basis for direct evidence that hemoglobin A_{1C} test was performed (either by that physician or by any provider). This information was then compared with the presence of one or more computerized claims for a hemoglobin A_{1C} test submitted during the period. For 1835 patients, there was no mention of the test in either the chart or the claims file; for 54 patients, both sources indicated the test was done; for 24 patients, the claim indicated that a service was provided somewhere, but there was no mention in this provider's chart; for 14 patients, there was mention of a hemoglobin A_{1C} test in the chart but no evidence in the claims file. This last group may comprise patients who received services in a previous time period, but where the service was documented during the study year; patients who received the test in a hospital; errors in charting, abstraction, or billing; or patients for whom the test was performed, but no bill was submitted. Overall, this analysis suggests that for this test, ambulatory claims undercount patients only modestly.

As part of the stand-alone medical record review component of this demonstration project, the primary care physician charts of 562 patients with diabetes were reviewed across the three states.[11] Of these charts, only 14% showed evidence of one or more hemoglobin A_{1C} test being performed in any setting. This rate is statistically identical to the 16% rate documented by the claims data.

Hospital Care.—This study focused on a cohort of patients who were diagnosed with diabetes in the office-based setting and who received care primarily in that setting. Patients diagnosed and treated for these conditions only while in the hospital were excluded from the study. An important limitation of this study is that tests ordered during the admission—and rolled into the diagnosis related group per-case payment—are not included in our use rates and are potentially a source of underreporting bias. For example, this underreporting could account for the somewhat lower rates in some locales (eg, rural areas), where patterns of practice might involve more hospital care.

Therefore, in addition to chart review, we performed a sensitivity test using a randomly selected sample of Maryland patients with diabetes. Among a sample of 455 patients with diabetes, 13% were admitted during the year with a primary diagnosis of diabetes and 29% were admitted for any reason. This suggests that the majority of diabetics in our study (about 70%) did not have the opportunity to receive "required" services as inpatients. To explore this issue further, we tested the hypothesis that admitted patients were less likely to receive a test in the ambulatory setting than those not admitted. We compared the proportion of patients in these two sample groups for whom a hemoglobin A_{1C} measurement was found in the ambulatory claims file. Among those diabetics admitted for any reason, 19% received the monitoring test. The comparable figure among the nonadmitted sample—for whom there was no opportunity to receive care as an inpatient—was 16%. These results do not support the underreporting hypothesis.

This sensitivity analysis corroborates the study's main finding that the hemoglobin A_{1C} test is ordered less frequently than guidelines recommend among both admission groups. However, if one does not accept the results of this analysis and wishes to assume that every diabetic admitted for any reason during the year received an undocumented hemoglobin A_{1C} test as an inpatient, then the overall three-state rate would increase to approximately 40%, up from 16%. Even with this assumption, the majority of diabetics in the study sample would not have received the test.

Implications

Many studies have shown variation of hospital and surgical services, but only a handful have identified variation in office-based practices.[25-30] No other study has examined cross-state variation in office-based care among a 100% sample of a patient population during an entire year of service. Moreover, this study represents one of the first broad applications of office-based claims to what managed care administrators and quality assurance professionals have come to call "quality profiling."[31,32]

As we have repeatedly acknowledged, the application of insurance claims data to quality measurement has a number of limitations. However, we believe that this study provides considerable evidence that Medicare's claims data have great potential for measuring the patterns of practice of groupings of office-based practitioners in a clinically meaningful and statistically sound manner. Although we strongly support this usage—especially as a first-cut tool to identify problem areas for further study—we do not suggest that claims data be used to single out individual patient cases or providers, particularly without verification using other data sources. Overall, we believe that analyses such as those presented herein could (and should) be used by physician organizations as at least one source of input into the ongoing quality improvement process.

The standards of care that we used as the basis of our assessment represented those proffered by blue-ribbon national panels and accepted as reasonable by panels of practicing physicians participating

in this study. Readers who find these recommended guidelines equivocal could use alternative standards or indications. Ultimately, the literature suggests that this type of information will assist accountable clinician groups to increase the provision of needed services and decrease the provision of unnecessary services among the patient populations to which they are responsible.[33]

In terms of substantive findings related to quality, this study suggests that there is a gap between national practice guidelines and actual primary care practice. Although further research is warranted, these results further underscore the need for programs to disseminate clinical practice guidelines relevant to primary care. In fact, on July 1, 1994, HCFA authorized the peer review organizations in Maryland, Alabama, and Iowa to work with the medical societies and specialty societies in their states on a cooperative pilot project focused on quality improvement of fee-for-service ambulatory care for Medicare beneficiaries with diabetes. A related pilot project for review of care in Medicare managed care settings was recommended to HCFA in August 1994.[34]

This study indicates that clinical actions in the primary care sector exhibit fairly wide levels of practice pattern variation. This variation appears to not only be associated with patient-related factors, such as case mix, but also characteristics that are linked directly to the physician (eg, specialty) and geography (eg, location of practice). Further delineation of the causes of variation across office practices would be useful to those designing quality improvement programs and should be the subject of further analysis. For example, to what extent does patient preference and compliance affect the receipt of service?

There is a growing body of research that indicates that patterns of care differ across specialty of physician, at least at the level of the visit or episode. For example, the preponderance of studies indicate that "comparable" care provided by family practitioners involves fewer resources and is usually less costly than care provided by internists and other more specialized providers.[29,35-38] This study adds to this cross-specialty literature, particularly by identifying office-based practice differences that may be associated with quality of care.

Despite the failure of national health system reform, all signs indicate that population-oriented health plans that emphasize primary care will gain importance. The methods developed for this study have direct relevance for the quality improvement programs that will be put in place by these private- and public-sector managed care insurance plans. Furthermore, the findings reported herein indicate that such concerted action will be essential if the care provided to Medicare beneficiaries and other Americans is to reach the highest achievable levels of quality.

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