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Creating Accountable Care Organizations: The Extended Hospital Medical Staff:

A new approach to organizing care and ensuring accountability

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Abstract

Many current policies and approaches to performance measurement and payment reform focus on individual providers; they risk reinforcing the fragmented care and lack of coordination experienced by patients with serious illness. In this paper we show that Medicare beneficiaries receive most of their care from relatively coherent local delivery systems comprising physicians and the hospitals where they work or admit their patients. Efforts to create accountable care organizations at this level—the extended hospital medical staff—deserve consideration as a potential means of improving the quality and lowering the cost of care.

Recognition that the U.S. health care system suffers from serious gaps in quality and widespread waste has stimulated a broad array of public- and private-sector initiatives to improve performance. These include not only public reporting, pay-for-performance (P4P), and quality improvement programs but also major initiatives by the organizations responsible for institutional accreditation and professional certification.¹ The underlying goal of these efforts is to improve the quality and lower the cost of care by fostering greater accountability on the part of providers for their performance.

A distinguishing feature of many of these efforts, however, is their focus on the individual provider as the locus of both performance assessment and accountability. This focus reflects the historical development, oversight mechanisms, and payment systems that prevail in the U.S. health care system and the interest of providers to be held accountable only for care that is within their direct control. The limitations of this approach are increasingly apparent. The provision of high-quality care for any serious illness requires coordinated, longitudinal care and the engagement of multiple professionals across different institutional settings. Also, many of the most serious gaps in quality can be attributed to poor coordination and faulty transitions.² For these reasons, a recent Institute of Medicine (IOM) report called for efforts to foster shared accountability among all providers for the quality and cost of care.³

Although it is attractive in theory, many practical challenges exist in identifying an appropriate locus for shared accountability in the current environment. Some have focused on physician groups, largely based on evidence suggesting that large physician groups achieve better performance.⁴ However, the physician organizations most capable of integrating and coordinating care—traditional health maintenance organizations (HMOs) and multispecialty group practices—represent only a tiny share of the current market, and most physicians still practice in small groups.⁵ Health plans are present in all U.S. markets but have largely focused

on negotiating favorable prices within relatively open networks of providers. New organizational forms, such as the advanced medical home, could conceivably allow primary care physicians to take on the responsibility for coordination and longitudinal care, but these remain untested and would depend, even at the outset, on the development of new payment mechanisms.⁶

In this paper we explore an alternative approach: fostering the development of accountable care organizations comprising local hospitals and the physicians who work within and around them.⁷ We build on ideas explored more than a decade ago by Pete Welch and Mark Miller as well as by several more recent papers by Dartmouth investigators.⁸ We show that virtually all physicians are either directly or indirectly affiliated with a local acute care hospital, whether through their own inpatient work or through the care patterns of the patients they serve. This allows us to empirically define the multispecialty group practices that we refer to as an “extended hospital medical staff.”

The first section presents evidence about the feasibility of defining and evaluating the performance of these still “virtual” organizations. The second section articulates the rationale for focusing performance measurement and, eventually, accountability for performance, at this level (or at a comparable level, existing large multispecialty group practices). The third section acknowledges the challenges to moving in this direction and suggests some possible paths forward.

Defining The ‘Extended Hospital Medical Staff’

The extended hospital medical staff is essentially a hospital-associated multi-specialty group practice that is empirically defined by physicians' direct or indirect referral patterns to a hospital.⁹ Here we summarize how we have defined such groups, describe how tightly physicians are affiliated with their hospitals, and show that Medicare beneficiaries' care is highly concentrated within their extended hospital medical staff. We then provide an example of how performance measurement at this level could be carried out.

For this analysis, we assigned physicians and their patients to hospitals using a three-year period of claims (2002–2004) and report utilization measures for calendar year 2003. We assigned physicians to their primary hospital by one of two methods. We assigned the approximately 60 percent of physicians billing Medicare who do inpatient work to the hospital where they provided care to the most inpatients. For physicians who do no inpatient work, we identified all of the Medicare beneficiaries to whom they provided care during the three-year period, and we assigned each physician to the hospital where the plurality of those patients were admitted.

Assignment of patients to hospitals and medical staffs can be carried out using a variety of approaches. Studies of conditions requiring hospitalization (such as myocardial infarction or major surgery) have assigned patients to the hospital where they received their initial inpatient care. Studies of Medicare beneficiaries with severe chronic illnesses have assigned patients based on the plurality of their discharges during a specific period.¹⁰ Assessment of primary care performance, however, requires assigning all patients—even those without discharges—to a provider. To define the ambulatory cohorts associated with a group of physicians, we assigned all Medicare beneficiaries to the physician (primary or specialty care) who provided most of their care in the ambulatory setting. Beneficiaries were then assigned to their physicians' primary hospital (and its extended medical staff). Finally, for each hospital, we identified the single other hospital most frequently used by the ambulatory cohort (which we defined as the “secondary” hospital). Consistent with intuition, this is most often a referral hospital.¹¹

Whether it is feasible even to consider the hospital and its extended medical staff as a locus of accountability depends on several empirical questions. (1) Is physicians' work, in fact, largely associated with a single or a predominant hospital? (2) Is Medicare beneficiaries' care sufficiently concentrated within each hospital's extended medical staff that it would be reasonable to consider holding those physicians collectively responsible for their assigned patients' care? (3) Does performance measurement at the medical staff level offer substantial advantages, in terms of either the scope of measures or the sample sizes available?

Is physicians' work concentrated in a single hospital?

Exhibit 1 summarizes several key aspects of empirically defined hospital medical staffs.

Medical staff size and composition—The medical groups defined by this method appear reasonable in terms of their size and composition. The average U.S. hospital has an extended medical staff of eighty-eight physicians per hundred beds. Larger hospitals and those in nonrural areas have more affiliated physicians. The specialty composition of the affiliated staff is plausibly related to hospital size and location. The average number of primary care physicians per hundred beds is relatively similar across hospitals of differing sizes and in rural and nonrural areas. Nonrural and larger hospitals, however, have more medical specialists, surgeons, and other physicians (such as radiologists and pathologists) per hundred beds.

Degree of physician affiliation—In general, physicians' degree of affiliation with their hospitals is strong. On average, 62 percent of physicians perform inpatient work; the proportion performing inpatient work is slightly greater in smaller and rural hospitals (Exhibit 1).¹²

Of all physicians doing inpatient work, only 60 percent work at a single hospital; however, among those who work at multiple hospitals, three-quarters of their inpatient work is at their primary hospital. Consequently, for physicians who do any inpatient work, 90 percent or more of their inpatient work is at their primary hospital.¹³ Among the 38 percent of physicians who don't do any inpatient work, more than half of their patients' admissions occur at the hospital to which the physicians were assigned (Exhibit 1).

Concentration of patients' care within the extended hospital medical staff

Most importantly, however, Medicare beneficiaries' care is highly concentrated within these empirically defined delivery systems (Exhibit 2). On average, 72.7 percent of beneficiaries' physician visits for evaluation and management (E&M) services (inpatient and outpatient) are to physicians within their assigned extended hospital medical staff, and an average of 63.5 percent of all admissions are provided by the primary hospital. Because many services are provided only at larger or more specialized hospitals, we describe the concentration of care not only for their primary hospital (the one to which they are directly assigned) but also for the single other hospital that is most frequently used by a given hospital's Medicare population. Taking the primary and secondary hospitals together, 81.8 percent of E&M services and 76.3 percent of admissions occur within this locally defined delivery system. And although there is some variation in the degree of care concentration, for 90 percent of hospitals (which account for 98 percent of assigned beneficiaries), the proportion of physician services provided by the primary hospital medical staff is greater than 44 percent, and the proportion provided by the primary and secondary hospital medical staffs is greater than 65 percent (data not shown).

The rationale for considering concentration of care within both primary and secondary hospitals is most apparent when one focuses on small hospitals (both rural and nonrural) and their surgical admissions. In small rural hospitals, for example, only 15.7 percent of surgical admissions for assigned patients occur at the rural hospital, but 39 percent occur at the identified referral hospital (for a total of 54.7 percent of surgical admissions at either one). Also, 82.1

percent of medical admissions occur at either the primary or secondary hospital. The overall patterns thus reveal a high degree of care concentration, even in rural areas.

Measuring performance at the hospital medical staff level

To further explore the technical feasibility and potential advantages of using the hospital and its extended medical staff as a locus of accountability, Exhibit 3 presents data on several dimensions of performance that are made possible (or more tractable) when the level of analysis is the extended hospital medical staff. For this example, hospitals and their extended medical staffs have been aggregated into five groups based upon their 2000–02 experience treating patients with heart attacks, colon cancer, and hip fracture. (These are the same study populations used in our earlier work in which we compared longitudinal costs and outcomes across regions.)¹⁴ *High-performing hospitals* were defined as those in the lowest quartile on both risk-adjusted one-year mortality and risk-adjusted one-year costs (using standardized prices); low-performing hospitals were those in the bottom quartile on both measures, while the other three groups had intermediate levels of performance.¹⁵

Exhibit 3 focuses on the performance of the extended hospital medical staff in treating their entire assigned ambulatory population during the year after the assignment to performance levels. Quality of ambulatory care is generally higher in the hospitals that had demonstrated lower risk-adjusted mortality: Women are more likely to have undergone mammography (52.8 percent in the highest-performing groups versus 42.6 percent in the lowest), and diabetic testing (for blood sugar or retinopathy) is somewhat better in higher-performing groups.

Higher-performing medical staffs also have much lower use of institutional settings, with fewer hospital discharges, fewer skilled nursing facility (SNF) discharges, and fewer total Medicare-reimbursed institutional days. They also experience fewer care transitions.

Finally, higher-performing hospitals also have lower risk-adjusted longitudinal costs for their ambulatory Medicare patients: Longitudinal costs in the lowest-performing hospital group were 26 percent higher than in the highest-performing hospital group (\$5,625 versus \$4,467).

The bottom half of Exhibit 3 presents data on the relative coherence of the extended hospital medical staffs in different performance groups: Higher-performing extended medical staffs appear to be somewhat more tightly affiliated with their hospital (that is, they do more of their work within their primary hospital); their patients receive more of their care from the extended medical staff itself; and the patients treated by the lower-performing extended hospital medical staffs see, on average, more different physicians.

These comparisons of performance are presented primarily as a test of concept (do potentially important differences emerge?) and must be interpreted cautiously. Our claims-based risk-adjustment methods might not have adequately accounted for differences in health status across systems. We used a limited set of quality measures to identify high-performing systems. Prior research indicates that many quality indicators are poorly correlated at the provider level, and efforts to define truly high-performing systems will require comprehensive performance measurement along multiple dimensions, to ensure that providers who appear to be high-performing on one dimension are not poor performers on other important dimensions that might be harder to measure.¹⁶ As we discuss below, these technical issues could be overcome with more-comprehensive measures of both underlying risk and system performance.

Exhibit 4 highlights another major technical advantage of focusing on the extended hospital medical staff for performance measurement. As mentioned above, prior studies have raised questions about the feasibility of assessing performance at the individual physician level. Exhibit 4 presents the numbers of physicians caring for patient panels of various sizes, either

as individuals or as members of an extended hospital medical staff. Half of the physicians who are the predominant providers for Medicare beneficiaries have fewer than fifty beneficiaries in their empirically defined panels. The middle columns make the obvious point that the proportion of all physicians who can thus be assessed for their contribution to the care of chronically ill patients (in the sense of being the responsible physician) is even smaller (largely for the obvious reason that they are in specialties that do not provide primary care, such as radiology or pathology). In contrast, when the focus of assessment is expanded to the extended hospital medical staff, 98 percent of physicians are affiliated with physician groups that serve Medicare populations of more than 500 beneficiaries. Even if the analysis is restricted to patients with heart failure, diabetes, or coronary artery disease, 95 percent of physicians are caring for populations of more than 500 Medicare beneficiaries—more than enough for reliable performance assessment.¹⁷

The Extended Hospital Medical Staff As A Locus Of Accountability: Advantages

The potential advantages of the hospital and its extended medical staff as a locus of accountability for quality and costs are substantial; three stand out.

Performance measurement

In the previous section we highlighted several technical advantages related to performance measurement: larger sample sizes, a broader scope of potential measures, and the feasibility of including all physicians who contribute to the care of a population within the frame of measurement. The latter two issues warrant further discussion.

The IOM's recent reports on performance measurement and P4P both call for the development of measures that focus on the longitudinal experience of Medicare beneficiaries (including measures of total costs and health outcomes), as well as measures that directly address the current fragmentation of care. Aggregating performance measurement to the level of large physician groups is the only approach, we believe, to achieving this dual objective. Large multispecialty physician groups could play this role, but these remain few and far between; in contrast, all physicians (and all Medicare beneficiaries) can now be assigned to an extended hospital medical staff. The development of comprehensive, population-based claims data repositories, already under development in many states, would enable the extension of the approach to the non-Medicare population. Also, physicians' resistance to public reporting could be mitigated by aggregation to these larger entities. Finally, there are important practical advantages: The administrative complexity of data collection methods and auditing procedures for 5,000 hospitals would be much less daunting than those required to collect and audit data on the 500,000 physicians practicing in the United States.

Fostering local organizational accountability for capacity

The most important reason, however, to focus on hospitals and their affiliated medical staffs is to establish accountability for local decisions about capacity. Higher spending across U.S. health systems is largely attributable to greater use of discretionary “supply-sensitive” services: visits, specialist consultations, tests, imaging services, and the use of institutional settings (rather than outpatient settings) for care.¹⁸ Patients' preferences do not explain these differences in care, and responses to survey-based clinical vignettes reveal that physicians in higher-spending systems have developed a more intensive practice pattern in exactly these discretionary clinical settings.¹⁹

“The most important reason to focus on hospitals and their medical staffs is to establish accountability for decisions about capacity.”

These findings are most consistent with an underlying causal model that highlights our current lack of accountability for capacity. Because such a high proportion of decisions are in the “gray areas” of medicine, physicians adapt their practices to work with whatever resources are locally available (such as making more frequent referrals in systems with more specialists). And—in the current payment environment—they are always able to stay busy themselves by seeing their own patients more often. Local decisions that influence capacity (capital investments, recruitment, and physicians' choices about practice location), therefore, are likely to be the first step in the causal chain leading physicians to adopt more-intensive practice patterns—and leading to the overuse of supply-sensitive services.

Comprehensive measures of longitudinal quality and costs at the hospital staff level would bring the impact of such decisions to light. Hospitals that recruited additional specialists or expanded their acute care facilities could expect to see those decisions reflected in their longitudinal performance measures. Similarly, decisions to invest in care management, reduce acute care capacity, forgo unnecessary specialist recruitments, or more effectively manage postacute care resources could result in improved quality and lower costs.

Intervening to improve quality and lower costs

The third reason to focus on larger organizations relates to their capacity to invest in improving quality and lowering costs. Most physicians remain in solo or small group practices and have neither the capital nor organizational capacity to invest in health information systems, the implementation of care management protocols, or ongoing quality improvement initiatives. Hospitals or large medical groups are much better positioned to invest in such systems and to provide financial and technical support to physicians aligned with their institution.

The Case Against: Culture And Current Market Forces

Although the technical barriers to performance measurement are modest and the advantages of fostering accountability at the hospital and its medical staff level are great, barriers to moving in this direction must be acknowledged.

The current market

The 1990s saw the rapid growth of organizations supporting physician-hospital integration as health plans promoted risk sharing and cost containment through capitation and narrow networks. Recent trends, however, are in the opposite direction. Under a payment system that now largely focuses on controlling the prices of individual services but continues to disproportionately reward high-technology procedures and those providers who own their facilities or increase their volume of services, entrepreneurial activity among physicians has increased dramatically. The consequence has been an increase in direct competition between physicians and hospitals, the growing unwillingness of community-based physicians to take emergency department (ED) call or follow their patients into the hospital, and the consequent need for full-time hospital-based physicians.²⁰ Reversing these trends will be difficult.

Cultural barriers

Physician practice and professional identity in the United States have long been characterized by a high degree of professional autonomy and a culture of individual responsibility—both of which are reinforced by current medical training, professional malpractice liability programs, and payment systems. Although there are numerous examples of physicians' being deeply engaged in collaborating with hospital administrators and nurses to improve the delivery of care within their local systems, these remain relatively isolated examples in the broad mainstream of clinical practice. Many physicians will resist the notion of accepting a degree of responsibility for the care of all patients within their local delivery system.

Legal obstacles

Legal obstacles to physician-hospital collaboration are substantial, especially with regard to sharing the potential financial gains of more-efficient care.²¹ The recent exemption granted to allow hospitals to purchase health information systems for physicians in affiliated practices is a notable exception.

Variability in degree of alignment

Our data reveal much variability across hospitals in the degree to which physicians and patients are already aligned with a single hospital and a relatively coherent medical staff. Although some hospitals and medical groups already have strong organizational structures and means to influence their affiliated physicians' behavior, those without well-established controls may resist efforts to hold their physicians accountable for performance.

Practical challenges

Even if the financial, cultural, legal, and political barriers are insufficient to derail this idea, many will argue that the practical barriers are likely to be insurmountable, especially if changes to the payment system are required. Many decisions will need to be made—in a highly charged political environment—about the selection of measures, the establishment of data collection and auditing processes, how and for what levels of achievement or improvement payments will be made, and the magnitude of any rewards.

Moving Forward

It is exactly these practical barriers, however, that make pursuing the notion of extended hospital medical staffs worthy of further discussion and cautious efforts to test the ideas more fully. The alternative—a narrow focus on provider performance assessment and P4P incentives aimed at individual physicians and institutional providers—will require overcoming many of the same political and practical challenges. But it would also risk reinforcing the fragmentation and lack of coordination that characterize the current delivery system.

Performance measurement and public reporting would be the logical first step. Because it is feasible to define the extended hospital medical staff and the patients they serve using readily available administrative databases, the implementation of performance measurement at this level could begin nationwide in relatively short order, especially when compared with the challenges of measurement within physicians' offices. Samples of hospitalized patients are already being identified and chart reviews carried out to assess the technical quality of care provided to hospitalized Medicare beneficiaries; these could be augmented by postdischarge surveys to assess not only patients experience of care (as is already planned under the Consumers' Assessment of Healthcare Providers and Systems, or CAHPS), but also functional and quality-of-life outcomes. And the measurement of costs is relatively straightforward. (In fact, hospital-specific measures of longitudinal resource use for seriously ill Medicare beneficiaries are already available through the *Dartmouth Atlas of Health Care*.)²²

Reform of the payment system to reward improved performance at the level of the hospital and its medical staff is already the focus of current and planned Medicare demonstration programs. The Physician Group Practice demonstration program, for example, rewards large medical groups that achieve specified targets for technical quality while reducing the growth of overall costs.²³ The Centers for Medicare and Medicaid Services (CMS) recently announced a new demonstration program (the Physician Hospital Collaboration Demonstration) specifically intended to bring hospitals and medical staffs together to improve care across episodes that go beyond a single acute care hospital stay.²⁴ Finally, the pressure of year-after-year growth in the volume of physician services has led Congress to ask the Medicare Payment

Advisory Commission (MedPAC) to explore the hospital medical staff as one of several alternatives to the current nationwide pool used for the Sustainable Growth Rate formula.²⁵ Any move to link future fee increases to the growth in volume of services delivered by individual hospital medical staffs would provide a powerful stimulus for the development of more coherent medical staff organizations.

MANY OF THE DEFICIENCIES IN U.S. health care are reflections of the disjointed and poorly coordinated care that patients receive as they move across settings and among providers: more frequent and flawed care transitions, failures of communication, and errors. Current organizational forms, payment methods, and regulatory and quality assessment systems reinforce this fragmented system. Because most patients receive their care within the context of a local delivery system comprising physicians and the hospital where they work, the hospital and its extended medical staff provide a natural organizational setting within which to improve the overall experience of care. Policy initiatives should be judged at least in part on the degree to which they strengthen accountability and collaboration at the level of the hospital and its medical staff.

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11. For Exhibits 1-3, we restricted the analysis to the 4,163 hospitals with at least fifty ambulatory patients in 2003. For Exhibit 4, we included all physicians and hospitals with at least one assigned patient.
12. Although the figure of 62 percent might seem low to some, there is plausible variation across specialties— and many where outpatient practice is the rule. For example, 70 percent of 90,300 internists, but only 29 percent of 18,499 general practitioners, do inpatient work; 87 percent of 21,500 cardiologists do inpatient work, but only 16 percent of 29,900 psychiatrists do.
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Characteristics Of Extended Hospital Medical Staffs: Size And Distribution Of Extended Hospital Medical Staffs And Their Degree Of Affiliation With Their Primary Hospital, Stratified By Hospital Size And Rural/Nonrural Location

EXHIBIT 1

	Overall (mean)				Nonrural hospitals (mean)			Rural hospitals (mean)	
	Mean	25th percentile	75th percentile		Large	Medium	Small	Large/medium	Small
	Number of hospitals	4,772	—	—		766	1,708	568	368
Number of physicians	571,520	—	—		301,281	217,734	14,893	20,029	17,583
Attributes of extended medical staff									
Number of physicians per 100 beds ^a									
Total	88	58	108		103	83	57	66	45
Primary care	30	19	36		30	29	30	28	27
Medical-subspecialist	21	12	26		26	18	8	12	5
Surgeon	21	13	26		25	20	11	15	7
Other	37	23	46		45	34	18	25	11
Physicians with inpatient work ^b									
Of these, percent working only at 1 hospital	62.1%	55.0%	68.9%		58.5%	63.2%	71.5%	67.3%	74.1%
If working at multiple hospitals, percent of work at primary hospital	62.5	47.5	80.0		59.4	62.4	68.3	74.5	72.0
For all MDs with hospital work, percent of work at primary hospital	74.9	70.8	79.0		75.5	73.5	74.9	76.8	76.5
	90.1	86.0	95.6		89.5	89.4	91.8	94.0	93.7
Physicians with no inpatient work ^b									
Percent of their patients' admissions at physician's primary hospital	37.9	31.1	45.0		41.5	36.8	28.5	32.7	25.9
	55.8	49.7	62.0		56.2	55.5	53.0	56.9	54.6

SOURCE: Authors' analyses of Medicare claims.

NOTES: Hospital size is defined by the number of Medicare discharges in 2003 and categorized as large (>5,000 discharges), medium (500–5,000 discharges), and small (<500 discharges). Rural hospitals are identified as those whose ZIP code area is classified as small town or isolated rural according to the four-level Rural-Urban Commuting Areas (RUCA) code.

^a Number of physicians is defined as the number of unique physicians assigned to a hospital either through their hospital billing or by where the patients they see are admitted. Hospital beds are those reported in the American Hospital Association file or if missing from the Centers for Medicare and Medicaid Services (CMS) Provider of Service file.

^b *Hospital/inpatient work* is defined as acting as attending or as surgeon, or submitting a Part B bill for a hospitalized patient.

Medicare Beneficiaries' Reliance On Their Hospital And Its Extended Medical Staff: Degree To Which Beneficiaries' Care Is Provided By The Extended Hospital Medical Staff And The Hospital To Which They Were Empirically Assigned During 2003, Stratified By Hospital Size And By Rural/Nonrural Location

EXHIBIT 2

	Overall			Nonrural hospitals			Rural hospitals		
	Mean	25th percentile	75th percentile	Large	Medium	Small	Large/medium	Small	Small
Number of hospitals	4,772	—	—	766	1,708	568	368	1,362	
Number of beneficiaries	5,138,457	—	—	2,474,029	1,890,756	129,791	306,929	336,959	
Concentration of care,									
medical staff									
Percent of all E&M billing to assigned staff									
Primary hospital	72.7%	66.4%	80.5%	75.7%	72.4%	61.8%	71.7%	57.6%	
Primary and secondary hospital ^a	81.8	77.0	87.9	83.1	81.8	77.9	80.8	74.3	
Hospital concentration of care, primary hospital only									
Percent of admissions to primary hospital									
All admissions	63.5	55.8	72.1	65.8	62.7	51.3	66.8	53.8	
Medical admissions	68.1	59.8	78.3	67.0	68.4	62.4	76.8	68.8	
Surgical admissions	52.3	41.5	66.0	62.6	49.1	25.1	40.9	15.7	
Hospital concentration of care, primary and secondary hospital ^a									
Percent of admissions to assigned or secondary hospital									
All admissions	76.3	70.6	83.6	77.1	75.7	72.7	78.4	73.1	
Medical admissions	79.2	73.5	86.7	77.9	79.5	79.5	84.4	82.1	
Surgical admissions	70.8	62.5	80.8	76.0	68.6	60.4	65.5	54.5	

SOURCE: Authors' analyses of Medicare claims.

NOTES: Hospital size is defined by the number of Medicare discharges in 2003 and categorized as large (>5,000 discharges), medium (500–5,000 discharges), and small (<500 discharges). Rural hospitals are identified as those whose ZIP code area is classified as small town or isolated rural according to the four-level Rural-Urban Commuting Areas (RUCA) code. E&M is evaluation and management.

^a Secondary hospital is the second most frequently hospital used, based on hospital admissions for the cohort of patients assigned to a specific primary hospital.

Longitudinal Experience Of Ambulatory Medicare Beneficiaries Assigned To Extended Hospital Medical Staffs (EHMSs) In 2003, Stratified By Performance On Adjusted Mortality And Price-Standardized Costs For Their Hospitalized Cohorts In 2000–02

EXHIBIT 3

Strata based on 2000–02 performance					
	Highest	High	Middling	Low	Lowest
Number of hospitals/EHMSs	169	735	2,090	937	232
Number of beneficiaries	296,822	916,116	2,530,111	942,236	298,850
Measures of quality and costs					
Quality of ambulatory care ^d					
Mammography, ages 65–69	52.8%	50.5%	48.3%	45.5%	42.6%
Colorectal cancer screening	12.6	12.9	13.9	13.5	13.7
Diabetic eye exams	41.7	41.8	40.7	39.4	39.0
Diabetes, HbA1c	59.5	57.7	55.8	54.7	53.1
Institutional utilization ^b					
Short-stay hospital discharges ^c	337	347	366	389	404
Long-stay hospital discharges ^c	13	17	17	19	14
SNF discharges ^c	70	73	76	82	86
Medicare institutional days ^c	4.05	4.18	4.44	4.81	5.21
Number of care transitions ^c	0.84	0.87	0.92	0.98	1.01
Spending per beneficiary ^c					
Physician services	\$2,247	\$2,381	\$2,641	\$2,731	\$3,012
Acute care hospital	2,221	2,272	2,379	2,514	2,613
Hospital and physician (total)	4,467	4,653	5,020	5,245	5,625
Measures of coherence and coordination					
Physician affiliation with hospital	63.8%	63.2%	61.3%	63.0%	59.3%
Physicians with inpatient work ^d					
Percent of work at primary hospital	84.2	81.4	80.6	77.0	74.6
Physicians with no inpatient work ^d	36.2	36.8	38.7	37.0	40.7
Percent of admissions at primary hospital	60.9	57.9	55.7	54.1	51.2
Concentration of care (medical staff)					
Primary hospital	79.7	75.6	72.7	70.2	68.7
Primary and secondary hospital ^e	87.6	84.1	81.6	80.1	77.7
Different physicians seen (average)	4.3	4.4	4.7	4.7	5.1

SOURCE: Authors' analyses of Medicare claims.

NOTES: We measured 2000–2002 performance along two dimensions: hospital-specific risk-adjusted one-year mortality and risk-adjusted one-year costs for physician and hospital services. Performance groups were defined as follows: highest performance (those in the lowest quartile of costs and mortality); high performance (the remainder that were above the median on both); lowest performance (those in the highest quartile on both mortality and costs); low performance (the remainder that were below the median on both). Finally, “middling” performance was defined as the remainder (that could have been above average on one dimension but below average on the other). Hospitals with less than 100 low-variation-cohort assignees were excluded from these analyses because of inadequate sample size.

^aPercentage of eligible patients receiving tests.

^b Spending and utilization measures were adjusted for age, sex, race and comorbidities present during the previous year.

^c Hospital and skilled nursing facility (SNF) discharges are per 1,000 beneficiaries. Medicare institutional days and transitions are per beneficiary and are calculated for hospital, SNF, and long-stay facilities.

^d Hospital/inpatient work is defined as acting as attending or surgeon or submitting a Part B bill for a hospitalized patient.

^e Secondary hospital is the second most frequently hospital used, based on hospital admissions for the cohort of patients assigned to a specific primary hospital.

Percentage Of Physicians With Assigned Ambulatory Patients, According To The Size Of The Medicare Patient Panels They Served During 2003, When Analyzed At The Individual Physician Level And At The Extended Hospital Medical Staff (EHMS) Level

EXHIBIT 4

Size of patient population	Assessment as individuals; percent of MDs with specified number of beneficiaries in their individual physician panel		Assessment as group; percent of MDs with specified number of beneficiaries cared for by their EHMS, as group	
	All patients	Chronic disease	All patients	Chronic disease
			Among all MDs (N = 572,637)	
			All patients	Chronic disease
0	0.0%	26.9%	55.6%	67.5%
1-24	35.9	31.4	16.0	14.0
25-49	14.0	15.5	6.2	6.9
50-99	15.8	15.3	7.0	6.8
100-249	22.1	10.2	9.8	4.5
250-499	10.3	0.7	4.6	0.3
>500	1.9	0.0	0.8	0.0
			All patients	Chronic disease
			0.0%	0.1%
			0.3	0.6
			0.3	0.4
			0.4	0.5
			0.6	1.2
			0.7	1.9
			97.7	95.3

SOURCE: Authors' analyses of Medicare claims.

NOTES: Analysis is based on a 20 percent sample of Medicare beneficiaries, inflated to reflect numbers of all Medicare fee-for-service beneficiaries cared for during this period.