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Quality-Based Payment for Medical Groups and Individual Physicians

This paper measures the extent to which medical groups experience external pay-for-performance incentives based on quality and patient satisfaction and the extent to which these groups pay their primary care and specialist physicians using similar criteria. Over half (52%) of large medical groups received bonus payments from health insurance plans in the period 2006–2007 based on measures of quality and patient satisfaction. Medical groups facing external pay-for-performance incentives are more likely to pay their primary care physicians (odds ratio [OR] 4.5; p<.001) and specialists (OR 2.5; p=.07) based on quality and satisfaction. Groups facing capitation payment incentives to control costs are more likely to pay member physicians on salary and less likely to pay based on productivity (p<.001 for primary care; p<.05 for specialists) than groups paid by insurers on a fee-for-service basis.

Medicare, state Medicaid programs, and numerous private insurers are experimenting with physician incentive programs that offer financial bonuses for improved performance, as measured through indicators of clinical quality and patient satisfaction (Christenson, Leatherman, and Sutherland 2007; Young et al. 2005; Rosenthal et al. 2006; Robinson and Megerlin 2007; Rosenthal et al. 2004). Considerable debate exists as to whether these bonuses should be paid to individual physicians or to larger physician organizations. Payments to groups rather than individuals are attractive because valid measures require large numbers of patients (Hofer et al. 1999), good performance is due often to collaborative as well as individual effort (IOM 2007), and groups may be more likely than individuals to invest the funds in practice improvements (IHA 2006; Gaynor and Pauly 1990; Conrad et al. 2002). Conversely, payments to individual physicians target the performance rewards more precisely and are less likely to be diluted across the performance of multiple clinicians who may not exert substantial influence on each other's behavior.

This study measures the prevalence among large medical groups (20 or more physician members) of pay-for-performance bonuses from health insurance plans based on quality

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and patient satisfaction. We then examine the payment methods used by these medical groups for their individual primary care and specialist physicians considering the percentage of annual compensation paid based on quality and/or patient satisfaction, as distinct from physician productivity (visits and procedures) and other factors.

We hypothesize that medical groups facing performance-based payment methods from health insurers are motivated to create similar incentives for their member physicians to increase the probability that the groups will achieve the targeted level of performance and receive the increased payments. Furthermore, we hypothesize that physician organizations participating in formal, collaborative quality improvement programs will be more motivated than otherwise similar organizations to encourage high-quality performance by individual physicians, over and above any motivation deriving from insurers' pay-for-performance programs.

We do not have strong hypotheses concerning the association between medical group size (number of physicians) and reliance on performance-based payment. It is not known whether larger physician organizations, relative to smaller organizations, are able to use financial incentives more effectively than nonfinancial factors, such as culture and leadership, to drive quality improvement. Conversely, large physician organizations may possess better electronic and management systems for measuring performance than smaller organizations, and may be able to rely on performance feedback to physicians that reduces the need for financial incentives. For analogous reasons, it is not possible to develop strong hypotheses as to whether ownership of the medical group by a larger hospital system or health maintenance organization (HMO) would increase or decrease the likelihood of using financial performance incentives, compared to independent physician-owned medical groups.

Data and Methods

We developed a list of all medical groups in the United States with 20 or more physicians, based on information from the Medical Group Management Association (2004), Cattaneo and Stroud (2004), Dorland Healthcare Information (2005), and the Integrated Healthcare Association (2005). Physician entities associated with academic medical centers (e.g., faculty practice plans) and physician groups that do not treat at least one of four major chronic illnesses (asthma, diabetes, congestive heart failure, and depression) were excluded.

A list of 1,023 possible medical groups was assembled, of which 763 were able to be contacted to ascertain whether they met study criteria. Of these, 433 met study criteria, resulting in an eligibility estimate of 56.8%. This eligibility estimate was applied to the 260 organizations that we were not able to contact, after multiple attempts, in order to verify whether they met eligibility criteria. We hence estimated that 148 of those we could not contact met study criteria, and that the total eligible population was 581. This approach to estimating potential respondents is standard for studies where the eligibility of nonrespondents cannot be verified (AAPOR 2007; Campbell et al. 2007).

Between March 2006 and March 2007, the medical director, president, or senior administrator was contacted by phone and asked to participate in a 35-minute structured survey. Respondents were reimbursed $150 for their time. A total of 339 medical groups participated in the study, for an adjusted response rate of 58.7%. Of these, 96 medical groups included only primary care physicians, 26 included only specialists, and 217 included both primary care and specialty physicians. There were no statistically significant differences in response rates across geographic regions.

The mix of payment incentives faced by the physician organization was measured in several ways. The presence of pay-for-performance programs was determined through questions asking whether the physician organization had received any additional income in the past year from health insurance plans based on clinical quality or patient satisfaction. Insurance payer mix was measured by the percentage of the medical group's annual revenues that came from commercial insurance, Medicare, Medicaid, and self-payment

by patients. We also measured the percentage of annual revenues that came from HMOs (including commercial, Medicare, and Medicaid HMOs) as distinct from non-managed care insurance products. To obtain insight into the extent to which a physician organization faced direct financial incentives to control costs, we measured the percentage of the medical group's patients for whom the group accepted capitation payment for professional and hospital expenses (Robinson and Casalino 2001).

We then examined how these physician organizations paid their individual physicians. This information was elicited through a question that asked: "For the majority of your individual primary care physicians, what is the percent of total compensation from the group that is based on 1) base salary, 2) productivity, 3) efficient allocation of resources, 4) patient satisfaction, 5) clinical quality of care, or 6) other, please specify?" The individual quality payment variables used in the analysis were a dichotomous indicator of whether either category 4 or 5 was nonzero and a continuous variable summing the percentages reported in 4 and 5. An analogous question was posed concerning compensation methods for specialist physicians.

To ascertain whether there was an association between medical groups' participation in external quality improvement initiatives and paying their individual physicians based on quality, we asked whether the group participated in any of four national initiatives, including Bridges to Excellence (2007), the Institute for Healthcare Improvement (IHI) Quality Collaborative (2007), Pursuing Perfection (2007), and Improving Chronic Illness Care (2007), or any other quality improvement initiatives (which are sponsored mostly by regional health plans). Other medical group characteristics hypothesized to influence payment methods included size (number of physicians in the group) and ownership (whether the group was owned by the physicians themselves or by a hospital or HMO).

We used multivariate statistical methods to identify the association between the manner by which medical groups were paid by health plans and the manner by which medical groups paid their individual physicians, controlling for size and other characteristics of the medical groups. Logistic regression was used to analyze the probability that the medical group pays any bonus to individual physicians based on quality or patient satisfaction, taking into account the manner by which the medical group itself was paid by insurers. We used multivariate least squares regressions to identify the effect of insurer payment methods to the medical group on the percentage of individual physician compensation received from the medical group based on performance (quality and satisfaction) bonus, salary, and productivity. The analyses of primary care physician payment methods were conducted on the 217 groups that included both primary care and specialist physicians and the 96 groups that included only primary care physicians. The analyses of specialist payment methods were conducted on the 217 groups that contained both specialist and primary care physicians, plus the 26 groups that contained only specialists.

Results

Table 1 presents descriptive statistics on the percentage of medical groups receiving pay-for-performance bonuses, other methods used by insurers to pay the medical groups, and the methods that medical groups employed to pay their member physicians. Slightly over half (52%) of the medical groups surveyed received some additional revenue from health plans based on quality or patient satisfaction. The physician organizations in this study remain highly involved in managed care, with 43% of revenues deriving from commercial, Medicare, and Medicaid HMOs. However, capitation, the strongest cost-reducing incentive developed by managed care plans, has declined, covering an average of only 8% of medical groups' patients. In terms of payer mix, these organizations rely heavily on commercial health insurance (52% of annual revenue) and, to a lesser degree, on Medicare (29%). Although Medicaid and patient self-pay contributed small portions of revenue overall, medical groups associated with safety-net

Table 1. Payment methods and other characteristics of medical groups

	Mean	Standard deviation
Percent of medical groups paid on quality or satisfaction	52.21	50.03
Medical group revenue from HMO (%)	43.08	30.76
Medical group patients paid for by capitation (%)	8.37	22.38
Medical group payer mix: (%)		
Commercial insurance	51.49	20.97
Medicare	29.26	16.15
Medicaid	12.62	16.68
Patient self-pay	6.62	8.89
Percent of medical groups that pay primary care physicians based on quality or satisfaction	26.84	44.38
Primary care income from: (%)		
Quality or patient satisfaction	2.14	5.44
Quality or patient satisfaction (for those physicians earning any bonus on quality or satisfaction)	7.55	8.00
Productivity (visits or charges)	60.53	42.37
Salary	35.68	41.64
Percent of medical groups that pay specialty care MD based on quality or satisfaction	18.93	39.26
Specialty care income from: (%)		
Quality or patient satisfaction	1.22	3.38
Quality or patient satisfaction (for those physicians earning a bonus on quality or satisfaction)	6.11	5.25
Productivity (visits or charges)	66.18	41.36
Salary	31.29	40.56
Percent of medical groups participating in quality initiative	59.00	49.26
Percent of medical groups owned by hospital or HMO	32.15	46.78
Number of physicians in medical group	188.21	512.10

hospitals and community clinics rely heavily on these sources of revenue. A third of these medical groups are owned by a hospital system or HMO.

Medical groups have developed payment methods for their individual physicians comparable to the quality and satisfaction-based incentives they face from health plans, but the prevalence of performance payment is lower for individual physicians than for physician organizations. Approximately one-fourth (27%) of medical groups pay their primary care physicians and one-fifth (19%) pay specialist physicians at least some portion of their compensation based on quality or patient satisfaction. The size of these bonuses is modest, averaging 7.5% of annual earnings for primary care and 6.1% for specialist physicians. The physicians are paid primarily based on individual productivity, measured in terms of patient visits and charges (61% for primary care physicians, 66% for specialists). The remainder of earnings is based on salary not associated with quality, satisfaction, or productivity (e.g., job tenure, specialty, partnership status, or administrative responsibilities).

Table 2 presents results from the multivariate analysis of payment methods used for primary care physicians. Medical groups that face financial incentives from health insurance plans to improve quality and patient satisfaction are more likely than other groups to offer similar incentives to their individual physicians, as indicated in the first column (odds ratio [OR] 4.5; $p<.001$). The scale of the association between group-level and individual physician-level performance bonuses can be seen in the second column, which analyzes the percentage of the individual physician's annual earnings that derives from a bonus based on quality or patient satisfaction. Primary care physicians in medical groups getting performance bonuses from health plans receive on average 2.3 percentage points more of their personal incomes based

Table 2. Multivariate analysis of payment methods for primary care physicians

	MD paid quality bonus		Percent of MD earnings from quality		Percent of MD earnings from salary		Percent of MD earnings from productivity	
	OR	95% CI	*B*	95% CI	*B*	95% CI	*B*	95% CI
Medical group paid on quality (yes=1, no=0)	4.495**	(2.125; 9.507)	2.303*	(.906; 3.700)	−1.711	(−10.553; 7.131)	−1.776	(−10.601; 7.049)
Revenue from:								
HMO	1.002	(.990; 1.014)	.005	(−.020; .030)	.277*	(.121; .434)	−.266*	(−.422; −.110)
Capitation	1.035**	(1.017; 1.054)	.032	(−.002; .067)	.550**	(.332; .767)	−.627**	(−.844; −.410)
Quality initiative	1.558	(.773; 3.142)	.156	(−1.239; 1.550)	1.451	(−7.372; 10.275)	−.190	(−8.997; 8.616)
Payer mix:								
Medicare	1.005	(.981; 1.030)	.043	(−.005; .091)	.162	(−.139; .463)	−.181	(−.481; .120)
Medicaid	1.003	(.980; 1.026)	−.009	(−.053; .035)	1.019**	(.739; 1.299)	−.995**	(−1.275; −.716)
Self-pay	1.030	(.993; 1.068)	.139*	(.061; .218)	.780*	(.284; 1.276)	−.956**	(−1.451; −.462)
Owned by hospital or HMO (yes=1, no=0)	1.912	(.956; 3.824)	1.008	(−.408; 2.424)	1.471	(−7.490; 10.432)	−3.466	(−12.410; 5.478)
Log number of MDs	1.246	(.905; 1.715)	−.118	(−.779; .544)	1.000	(−3.187; 5.186)	−1.238	(−5.417; 2.940)
Intercept	.015**		−1.580	(−5.029; 1.869)	−9.654	(−31.477; 12.168)	110.394**	(88.614; 132.175)
−2 log likelihood		234.938						
Adjusted *R*-squared				.084		.373		.397

Note: OR= odds ratio; CI= confidence interval.
* *p*-value<.01; ***p*-value<.001.

on analogous measures of performance than do physicians in groups not receiving performance bonuses ($p<.01$). This represents a doubling of the overall average performance payment across all physician organizations (2.1%), or a 32% increase in the average payment for those medical groups that pay at least some bonus based on quality or satisfaction (7.6%) (see Table 1). No association is observed between organizational participation in a formal quality improvement program, on the one hand, and the decision to base some part of individual physician compensation on quality of care, on the other.

The third and fourth columns of Table 2 show the association between basing primary care compensation on individual productivity or salary and other factors. These choices do not appear to be influenced by whether the medical group receives bonus payments from health plans based on quality or satisfaction, but are highly correlated with whether the medical group is paid based on capitation or fee-for-service. Medical groups whose revenue comes disproportionately from HMOs (as distinct from other types of insurance) and from capitation (as opposed to fee-for-service) base a significantly greater portion of primary care compensation on salary, and less on productivity, than do otherwise similar groups that are less dependent on managed care revenues ($p<.01$; columns 3 and 4). Medical groups whose revenues are disproportionately derived from Medicaid ($p<.001$) and self-pay ($p=.002$) patients base a greater share of physician income on salary than on other methods; these medical groups tend to be associated with safety-net organizations.

Table 3 analyzes the association between payment methods used by health plans for medical groups and the methods used by the medical groups for their individual specialists. Medical groups paid by health plans according to quality and patient satisfaction base a larger portion of specialist earnings on measures of performance than do other medical groups (OR 2.5; $p=.07$). Groups with more capitation revenue base a greater portion of specialist compensation on salary and a lesser portion on productivity than do groups with less managed care ($p<.001$); however, no association is observed with the percentage of revenue from (noncapitated) HMOs. Medical groups more reliant on Medicare revenues base a greater portion of specialist compensation on salary than do groups less reliant on Medicare ($p=.002$); no association was observed between organizational ownership and payment methods for primary care physicians in Table 2. There is no consistent association between the size or ownership of the medical group, on the one hand, and the methods by which a group pays its individual physicians, on the other.

Implications

Pay-for-performance has become a common component of reimbursement by health insurers for physician organizations. As reported here, in 2007, 52% of large medical groups surveyed received payment bonuses based on quality and/or patient satisfaction. Medical groups have developed similar payment bonuses for their individual physician members. Approximately one-fourth of large medical groups pay their member physicians partially based on measures of clinical quality and patient satisfaction, with the size of the bonuses averaging 7.6% for primary care physicians and 6.1% for specialists. The extent to which a medical group decides to pay performance bonuses to its individual physicians is significantly associated with whether the group is itself paid by health plans based on analogous measures. This association suggests that medical groups facing pay-for-performance programs perceive a value in aligning the incentives of the individuals within the groups with those affecting the group.

The prevalence of external performance bonuses paid by insurers to the medical groups is substantially greater than the prevalence of internal bonuses paid by the medical groups to their primary care and specialist physicians. This suggests that medical groups also rely on nonfinancial performance incentives, such as feedback on the quality of care for individual physicians perceived as performing below group norms. Whether the difference between external and

Table 3. Multivariate analysis of determinants of payment methods for specialty care physicians

	MD paid quality bonus		Percent of MD earnings from quality		Percent of MD earnings from salary		Percent of MD earnings from productivity	
	OR	95% CI	*B*	95% CI	*B*	95% CI	*B*	95% CI
Medical group paid on quality (yes=1, no=0)	2.475	(.934; 6.557)	1.286†	(.247; 2.324)	−6.054	(−17.010; 4.902)	4.293	(−6.807; 15.393)
Revenue from:								
HMO	.995	(.978; 1.012)	−.001	(−.019; .017)	.393**	(.202; .583)	−.376**	(−.570; −.183)
Capitation	1.042**	(1.020; 1.064)	.025†	(.001; .050)	.294†	(.035; .553)	−.324†	(−.586; −.061)
Quality initiative	1.429	(.561; 3.639)	−.035	(−1.038 .967)	5.526	(−5.051; 16.103)	−7.298	(−18.014; 3.417)
Payer mix: (%)								
Medicare	.999	(.968; 1.032)	.011	(−.022; .044)	.541*	(.196; .887)	−.599*	(−.949; −.249)
Medicaid	.994	(.952; 1.038)	.016	(−.023; .055)	.884**	(.472; 1.296)	−.887**	(−1.305 −.470)
Self-pay	1.042	(.989; 1.098)	.057	(−.011; .126)	.381	(−.339; 1.100)	−.462	(−1.191; .267)
Owned by hospital or HMO (yes=1, no=0)	1.889	(.737; 4.844)	.249	(−.831; 1.329)	9.205	(−2.193; 20.604)	−9.895	(−21.444; 1.653)
Log number of MDs	1.375	(.892; 2.118)	.098	(−.381; .577)	3.922	(−1.136; 8.979)	−4.069	(−9.193; 1.055)
Intercept	.011*		−.958	(−3.576; 1.661)	−36.351†	(−63.992; −8.710)	138.567**	(110.563; 166.571)
−2 log likelihood		142.284						
Adjusted *R*-squared				.047		.264		.273

Note: OR= odds ratio; CI= confidence interval.
†*p*-value<.05; **p*-value<.01; ***p*-value<.001.

internal financial incentives will persist or, rather, that it reflects a lag in the adjustment of internal payment methods to external pay-for-performance programs remains to be seen.

These findings highlight financial incentives, but cannot compare their role relative to that of nonfinancial incentives for improving physician performance. Proponents of financial incentives targeted to physician organizations, as distinct from individual physicians, argue that quality outcomes are often the result of cooperation and the data systems, culture, and peer comparisons that support cooperation, rather than of individual clinical visits or procedures. This view of quality is well articulated by the Institute of Medicine in *Crossing the Quality Chasm* (2001). In this view, the funds obtained by medical groups should be used to invest further in quality-supportive organizational capabilities rather than distributed as personal income to individual physicians. Our data suggest that whatever the prevalence and effectiveness of nonfinancial mechanisms for improving physician performance, some medical groups are using financial incentives as well, especially in contexts where they receive financial incentives from health plans.

It is possible that the direction of causality runs from medical group use of performance payment for individual physicians to insurer use of performance payment for medical groups, rather than from the converse direction hypothesized in our study. To the extent that insurer pay-for-performance programs bring a risk of financial loss as well as a possibility of financial gain, medical groups may not participate unless they first have in place performance-based payment mechanisms for their individual physicians. To our knowledge, based on informal conversations with leaders from health plans and medical groups, most pay-for-performance programs have only an upside, offering the potential for gain (if performance targets are met) without potential for loss (if they are not). Hence, there is no reason for a medical group to refuse participation. The prevalence of pay-for-performance programs (though not the amounts paid out under these programs) in a given community is decided largely by the health plans and is exogenous from the point of view of the physician organizations.

The negative associations reported here between managed care incentives to control costs (capitation), on the one hand, and the use of productivity incentives (payment based on visits or charges), on the other, also testify to the alignment of external and internal payment methods. This association is consistent with other studies (Pedersen et al. 2000; Robinson et al. 2004). Groups reimbursed by insurers on a fee-for-service basis increase revenues when their physicians conduct more patient visits, tests, and procedures, while those paid on capitation increase revenues when they attract more patients to affiliate with the practice. These results suggest that medical groups paid by insurers on a fee-for-service basis use payment methods that reward member physicians for conducting the visits, tests, and procedures that maximize revenues. Conversely, medical groups paid by insurers based on capitation avoid individual physician payment rewards for visits, tests, and procedures; instead, they use salary payment methods that reward population-based approaches, team approaches to care, cooperation with nonphysician staff, care outside the traditional face-to-face visit, and other practices that attract patients without as extensive a reliance on individual visits and the charges they generate.

Our findings are consistent with the economic literature on payment incentives, which highlights the importance of mechanisms that reward both individual and cooperative efforts and that compensate improved performance without putting the recipient at financial risk for outcomes he or she cannot control (Prendergast 1999; Baker, Jensen, and Murphy 1988). These results also are consistent with the health services literature on the role of physician organizations as a buffer between the individual physician and the health insurers, deciding whether and to what extent to pass the financial incentives facing the group on to the individual physician (Robinson 1999; Rosenthal et al. 2002; Hillman, Welch, and Pauly 1992).

Our survey was not able to identify the specific type of quality measures that underlie the performance-based payments from

insurers to medical groups and those from medical groups to individual physicians. It is possible that some medical groups just pass through to individual physicians their pro-rata share of any bonus received from health insurers. Our informal discussions with medical group leaders suggest, however, that the organizations seek to base individual physician compensation on measurable elements of individual performance rather than have them depend on the difficult-to-predict and often slow-to-be-paid bonuses from health plans to the medical group.

The findings reported here should be interpreted within the limitations of this study. The results are not generalizable to the majority of U.S. physicians, who do not practice in large medical groups. There appears to be some trend toward greater employment of physicians, and these may constitute a basis for collective performance incentives in coming years (Liebhaber and Grossman 2007). Nevertheless, most insurers' pay-for-performance programs focus on small practices rather than large groups. It may be that the lesser extent of performance-based pay for individual physicians (relative to pay for medical groups) reported in this study—where the payment is designed by the medical group—is indicative of problems facing performance-based payment designed by insurers as well. To the extent this is the case, the high prevalence of performance bonuses reported here for medical groups (52%) will overestimate the reach of performance bonuses available to small physician practices from insurers.

The policy implications of our study relate to the choice of instruments available to Medicare and Medicaid for stimulating quality improvement. Most obviously, our findings support the adoption of pay-for-performance programs by public insurers because physicians develop analogous programs for themselves when the medical group itself, rather than merely the health insurer, is allocating compensation across productivity, quality, and other dimensions of physician activity. This does not imply that nonfinancial mechanisms such as comparative effectiveness studies, dissemination of best practices, public reporting of clinical variation and outcomes, and development of evidence-based protocols have no value, but rather that financial incentives constitute one valid instrument among the others.

The biggest challenge facing public payers with respect to quality improvement is that most physicians do not belong to the type of large medical groups studied here. At this point, pay-for-performance programs for Medicare and Medicaid must target individual physicians (as well as medical groups, where available) or forgo the hope of a broad impact. It may be that public (and private) payers can work with intermediate organizations such as independent practice associations and physician-hospital organizations in designing performance improvement programs that target collaborative influences on outcomes.

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