

## Effects of Compensation Method on Physician Behaviors

*James Tufano, MHA; Douglas A. Conrad, PhD; Anne Sales, PhD;  
Charles Maynard, PhD; Jay Noren, MD; Eric Kezirian, MD;  
Kenneth G. Schellhase, MD; and Su-Ying Liang, PhD*

**Objective:** To examine physician and leader perceptions of the relationship between physician compensation and the productivity of physicians practicing in medical groups.

**Study Design:** Key informant interviews identified subjects' perceptions of factors influencing physician productivity and the behavioral effects of individual financial incentives. Interview transcripts were analyzed by a team of physicians, economists, and other researchers.

**Study Population:** Physicians, medical leaders, and group practice administrators (n = 114) representing 46 medical group practices in California, Oregon, Washington, and Wisconsin were interviewed.

**Results:** Five major themes emerged: (1) Most physicians reported that financial incentives did not substantially affect their own behavior, except for productivity. However, they suggested that specific compensation models do lead to certain seemingly undesirable physician behaviors. (2) By contrast, medical group leaders reported that financial incentives do affect a variety of physician behaviors. (3) Four productivity drivers emerged: financial incentives, demand-side factors, systems and infrastructure, and other individual or group attributes. (4) Physician compensation systems are evolving toward a blend of production-based and production-neutral incentives, plus new metrics aligned with the demands of managed care. (5) Culture, size, and specialty mix are significant determinants of group physician compensation systems.

**Conclusions:** Compensation method is perceived to be a significant influence on physician productivity, particularly among group practice leaders. The changing context of medical practice represents another powerful "macro" lever on physician behavior.

*(Am J Manag Care 2001;7:363-373)*

Physician compensation methods play an important role in the delivery of healthcare and the financial success of medical group practice organizations. This study focuses on the determinants and consequences of medical groups' organizational choices, including the methods used to determine their physician members' pay. Via direct interviews with senior-level medical group practice leaders and practicing physicians, we specifically examined the perceived determinants of physician productivity, the factors that determine the choice of compensation methods used by medical groups, and the perceived effects of different financial incentives on physician productivity and other practice behaviors.

Empirical evidence from previous studies of productivity suggests that physicians' behavioral responses to different financial incentives are significant. However, even the most recent productivity studies were based on data generated during or before 1978,<sup>1</sup> and none has directly explored

From Asterion.com, Seattle, WA (JT); Department of Health Services, University of Washington, Seattle, WA (DAC, AS, CM); Health Services Research and Development Program (AS) and Audiology Clinic (EK), Veterans Administration Puget Sound Healthcare System, Seattle, WA; Texas A&M University System Health Science Center, College Station, TX (JN); College of Medicine, University of Illinois, Rockford, IL (KGS); and School of Health Administration and Policy, Arizona State University, Tempe, AZ (SYL).

Address correspondence to: Douglas A. Conrad, PhD, University of Washington, Department of Health Services, 1959 NE Pacific St, Room H660, Seattle, WA 98195-7660. E-mail: dconrad@u.washington.edu.

© Medical World Group

many of the commonly perceived adverse behavioral effects of physician compensation-related financial incentives that have contributed in large part to negative perceptions of managed care principles and practices.

---

... METHODS ...

### Sample Selection and Participant Recruitment

Key informants were recruited from medical group practices located in California, Oregon, Washington, and Wisconsin. The 4 states and corresponding metropolitan areas (Seattle/Everett, central Washington, Spokane, Portland/Vancouver, Eugene/Springfield, Medford, San Francisco/Oakland/San Jose, Los Angeles/Orange County, San Diego, Milwaukee, Madison, central Wisconsin) within each state were selected in order to get study participants who represented medical groups in areas with varying market, social, and demographic conditions; relatively high managed care penetration; and varying percentages of physicians practicing in medical groups. The 3 Pacific Coast states plus Wisconsin have widely varying socioeconomic environments, and the percentage of at-risk managed care revenues is generally high: approximately 32% in the Wisconsin sample and from 45% to 49% for the 3 Pacific Coast states. The percentage of physicians practicing in groups varies substantially, from 22% in California to almost 84% in Wisconsin.<sup>2</sup>

A targeted minimum of 10 participating medical groups was set for each of the 4 states. (Due to its proximity and similarity to the Portland area market for healthcare services, groups from the Vancouver, Washington, area were included in the Oregon sample rather than the Washington sample.) Only medical group practices that were legally defined as such and that consisted of 3 or more licensed allopathic and/or osteopathic physicians were included in this study. Attempts were made to recruit a balanced sample consisting of representatives from small-, medium-, and large-sized single-specialty and multi-specialty medical groups. The exception was single-specialty anesthesiology, pathology, and radiology groups, which were excluded from the sample.

Lists of medical group practices and contact names, addresses, and phone numbers of medical group practice administrators were obtained from the Medical Group Management Association and public sources.<sup>3</sup> Telephone calls were placed to verify or update organizational and contact information, and introductory letters that explained the

purpose of the study and nature of requested participation were mailed and/or faxed to the lead administrators of medical groups targeted for participation.\* Follow-up telephone calls were placed to targeted individuals who did not respond to the letters within 2 weeks to request their participation in the study.<sup>†</sup>

### Interview and Data Collection Processes

The majority of interviews were conducted in person at the subjects' offices by 2 of the authors between May and December of 1998. A small number of interviews were conducted via telephone. Interviews were preceded by presentation and brief verbal description of an institutionally approved human subjects consent form, which was signed by both the lead interviewer and the subject in all cases.<sup>‡</sup> Interviews, which ranged in duration from 30 to 90 minutes, were then conducted using 1 of 2 interview instruments comprised of a list of specific pretested questions that were asked in sequential order. (The 2 interview instruments are available upon request from the corresponding author.) Most questions required closed-end or categorical responses, although some were open-ended and offered greater flexibility to both the interviewers and the subjects to explore nuances. All interviews were taped and later transcribed in summary form, with all specific coded responses and numerous verbatim quotes entered into the interview transcription text documents and/or SPSS data files.

---

\*Follow-up telephone calls revealed that many of the organizations targeted for contact letter mailings were no longer in existence at the time that the call was placed, most commonly due to recent merger or acquisition activity. Also, many of the individual administrators to whom the contact letters were addressed were no longer employed by the targeted medical groups at the time of the follow-up calls.

<sup>†</sup>Lead administrators (typically the chief executive officer) were asked to personally participate as interview subjects. They also were asked to select 1 additional administrator (typically the chief financial officer, chief operating officer, medical director, or a physician leader of the group's compensation committee) and 2 practicing physicians to participate as interview subjects.

<sup>‡</sup>All subjects were informed that their specific responses would be held confidential within their organizations and that their names and the identities of their organizations would not be revealed in any publications resulting from the research or disclosed to any individuals other than members of the research team. They also were assured that publications resulting from the research would not reveal the identities of their organizations by listing group names or unique characteristics.

**Identification and Validation of Key Themes and Observations**

Due to the nature of the interview data and the purposive nature of the participant sample, content analyses of a primarily qualitative nature were performed, rather than statistical inference or formal hypothesis testing. All members of the research team were provided with a complete set of interview transcript documents and the SPSS file containing coded response data for specific interview questions. They were asked to review these files in detail and to identify common themes among the responses, as well as outlier individual subject responses and comments of particular conceptual significance. Group consensus was used to develop a master list of key response themes and observations emerging from examination of the transcripts and coded data. To control for individual bias in interpretation, the list was then evaluated using simple but standardized validation and categorization rules.<sup>8</sup>

... RESULTS ...

**Description of Interview Sample**

Table 1 summarizes the characteristics of the key informant interview sample. The 46 participating groups were relatively uniformly distributed among the 4 states, with multispecialty groups predominant overall (30 of 46) and in each state. Approximately equal numbers of leader and physician interviews were conducted. Reflecting the purposive sampling design, small and large medical groups were over-sampled, but medium-size groups were represented in each state. A mix of individual production-based and production-neutral (salary) compensation methods was mirrored in the study sample: in

**Table 1.** Description of Interview Sample

Sample Characteristic	California	Oregon*	Washington*	Wisconsin	Total
Total medical groups	12	11	13	10	46
Single-specialty groups	5	5	4	2	16
Multispecialty groups	7	6	9	8	30
Physician interviews	13	12	18	10	53
Leader interviews	14	14	20	13	61
Small groups (3-15 physicians)	5	6	3	2	16
Medium groups (16-50 physicians)	1	1	2	4	8
Large groups (>50 physicians)	6	4	8	4	22
<30% of physician compensation based on individual production	5	3	3	1	12
30%-70% of physician compensation based on individual production	1	1	1	1	4
>70% of physician compensation based on individual production	6	7	9	8	30

\*Two participating medical groups located in Vancouver, Washington, are categorized as Oregon groups.

almost two thirds of sampled groups, more than 70% of the typical physician's compensation was based on individual production; in roughly one fourth of sampled groups (12 of 46), compensation was primarily production-neutral. Physician interviewees were predominantly male (47 of 53), averaged 16 years in practice (ranging from 6 months to 33 years), and had been with their current medical group for an average of 13 years.

**Behavioral Impacts of Financial Incentives**

*Physician Perceptions.* The majority of physicians reported that their current compensation method generally had no influence on their daily work activities (Table 2). When asked about the influence of their current compensation method, more than 75% of physicians interviewed reported "no influence," with the exception of 3 behaviors. First, 64% of physicians believed that their current compensation method was associated with enhanced productivity (only 4% thought the current method

<sup>8</sup>Themes that could be supported by either descriptive statistics of the coded responses and/or a minimum of 5 verbatim quotes were categorized as "observations of central tendency." Those that were found to be directly contradicted by the descriptive statistics and/or a minimum of 5 verbatim quotes were eliminated from the list. All others were categorized as "outlier observations of ambiguous importance."

led to lower productivity). Second, 44% perceived that the current method encouraged increased attention to patient satisfaction. Third, 41% of physician interviewees perceived that the current method negatively affected their average time with

patients. Given the predominance of individual production-based compensation in the study sample, these perceptions primarily reflect the incentives of "high-powered," proproduction physician payment methods.

When physicians paid predominantly based on their individual production were asked to assess the influence on their routine activities of a hypothetical *reduction* in production incentive (from a >50% production-based method to a 50% salary/50% production-based method), there were few perceived changes (Table 3). Responses suggested that reduced physician productivity was the only anticipated effect perceived by a majority of physician interviewees (54%). More interestingly perhaps, roughly one sixth of the physicians responded that the implied reduction in production incentive would lead to *increased* phone consultation with patients and physicians and improved quality of documentation. A relatively large proportion (almost 22%) of physicians felt that attention to patient satisfaction would improve; however, in contrast, almost 14% felt that attention to patient satisfaction would decline in response to decreased production incentive.

*Practice Leader Perceptions.* Table 4 presents group practice leaders' perceptions of likely physician response to a reduction in individual production incentive. As might be expected, the predominant hypothesized response was a reduction in physician production per hour worked. However, several other aspects of physician activity level were posited to *increase*, on balance, in response to reduced production incentive. In descending order of the net percentage<sup>11</sup> of respondents

<sup>11</sup>This inference is derived from a comparison of the difference between the percentage of respondents positing an increase minus the percentage positing a decrease as a result of the reduced production incentive.

**Table 2.** Influence of Current Compensation Method on Physician Activity Level: Physicians' Perceptions

Activity	Percentage		
	Positive	None	Negative
Phone consultation with patients	8	79	14
Phone consultation with physicians	8	83	10
Referral to specialists	4	89	8
Average time with patients	8	51	41
Average time supervising physician extenders	10	82	8
Technical quality of patient care	20	78	2
Attention to patient satisfaction	44	52	4
Volume of diagnostic services ordered	6	81	14
Physician production per hour worked	64	33	4
Quality of documentation	17	77	6

**Table 3.** Influence of Change to 50% Production/50% Salary Compensation Method on Physician Activity Level: Perceptions of Physicians for Whom the Hypothetical Example Represents a Reduction in Individual Production Incentive (37 of 53)

Activity	Percentage		
	Positive	None	Negative
Phone consultation with patients	18.9	73.0	8.1
Phone consultation with physicians	16.2	81.1	2.7
Referral to specialists	8.1	86.5	5.4
Average time with patients	10.8	78.4	10.8
Average time supervising physician extenders	8.1	91.9	0
Technical quality of patient care	2.7	94.6	2.7
Attention to patient satisfaction	21.6	67.6	10.8
Volume of diagnostic services ordered	0	94.6	5.4
Physician production per hour worked	10.8	35.1	54.1
Quality of documentation	16.2	83.8	0

hypothesizing an increase, the most prominent activities were attention to patient satisfaction, average time with patients, phone consultation with patients, referral to specialists, quality of documentation, and phone consultation with physicians.

*Potential Adverse Behavioral Impacts of Financial Incentives.* When asked about the industrywide prevalence of 3 specific “undesirable” physician behaviors associated with specific physician financial incentives, physicians’ responses suggested another aspect of the perceived interplay between financial incentives and behavior. The data presented in **Table 5** suggest that 3 such behaviors—avoidance of capitated patients under production-based compensation, “dumping” of severely ill patients under capitation, and withholding of services under capitation—are perceived to result from compensation incentives, and they appear to exist with troubling frequency. While there is variation across states in the proportion of physicians perceiving these effects and in physicians’ estimates of the frequency of each of these behaviors, with 1 exception the majority felt that financial incentives were having these impacts. Equally important, these adverse consequences were believed to be relatively common.

### Determinants of Physician Productivity

*General Productivity Factors.* Four distinct categories emerged from the open-ended interview questions regarding factors perceived to influence physician productivity (**Table 6**):

- Compensation and financial incentives,
- Demand-side factors,
- Infrastructure and systems, and
- Individual and/or group characteristics.

Each of these categorical factors was cited by at least one third of the participants. Interestingly, physicians mentioned infrastructure and systems

most frequently as productivity drivers; but leaders mentioned individual or group-specific factors most frequently and—like the physicians—acknowledged the role of infrastructure and systems in productivity. Only about one third of physicians alluded to compensation or financial incentives as productivity factors, but almost two thirds of leaders did.

**Table 4.** Influence of Change to 50% Production/50% Salary Compensation Method on Physician Activity Level: Perceptions of Leaders for Whom the Hypothetical Example Represents a Reduction in Individual Production Incentive (44 of 61)

Activity	Percentage		
	Positive	None	Negative
Phone consultation with patients	26.8	65.9	7.3
Phone consultation with physicians	19.1	78.6	2.4
Referral to specialists	22.0	68.3	9.8
Average time with patients	33.3	50.0	16.7
Average time supervising physician extenders	12.5	85.0	2.5
Technical quality of patient care	11.9	83.3	4.8
Attention to patient satisfaction	35.7	54.8	9.5
Volume of diagnostic services ordered	2.4	83.3	14.3
Physician production per hour worked	16.7	35.7	47.6
Quality of documentation	21.4	71.4	7.1

**Table 5.** Adverse Behavioral Impacts of Financial Incentives: Percentage of Physicians Answering “Yes” and Average Score of Affirmative Responses\*

Response	California	Oregon	Washington	Wisconsin	Total
Prevalence of avoiding capitated patients under production-based compensation	69% yes; 3.56	42% yes; 3.80	72% yes; 3.23	50% yes; 2.10	63% yes; 3.23
Prevalence of “patient dumping” under capitation-based compensation	54% yes; 3.57	67% yes; 2.63	72% yes; 3.00	80% yes; 1.94	72% yes; 2.79
Prevalence of inappropriately withholding care under capitation-based compensation	92% yes; 3.67	100% yes; 3.29	83% yes; 2.77	90% yes; 2.94	92% yes; 3.16

\*On a 5-point scale, 1 = almost never; 5 = very common.

Physicians often (60% of interviewees) referred to demand-side factors as an important influence on productivity, but only 33% of leaders mentioned demand-side factors.

In summarizing his view on productivity drivers, 1 practice leader in Wisconsin offered a good example of an administrator's perspective:

*Intrinsic drivers (ie, work ethic) are most important. These are the factors that cause physicians to spend an optimal amount of time seeing patients. They vary among physicians and specialties. Education, feedback, data sharing, financial incentives, technologies used, documentation, and peer interaction are also important. Although market supply and demand factors do have an impact, they are not as important as economists might lead you to believe.*

Specific examples of each type of productivity driver surfaced during the open-ended interviews. Demand-side factors included market share, individual patient demands and characteristics, administrative paperwork requirements imposed by health maintenance organizations, volume of incoming phone calls, requirements of referring physicians, and

other similar factors that relate to the volume and type of work that's available to the physician on any given day.

Infrastructure and system factors included the level and type of support staff available, patient scheduling processes, facilities layout, lab and radiology turnaround times, operating policies and procedures, and other elements of the physicians' physical working environment.

Individual or group characteristics included work ethic, lifestyle choices, target income level, individual abilities, work style, age, gender, competitive nature, ability to work as a team member, peer pressure, group norms, and other unique personal traits and elements of organizational culture.

*The Influence of Group Factors, or Culture, on Physician Productivity.* Most of the medical groups in this sample utilized a compensation method that was primarily based either on the performance of the individual physician (eg, individual production) or the performance of the organization (eg, equal shares or salary). **Table 7** illustrates that much higher percentages of physicians and leaders in groups that used predominantly equal-shares compensation identified group culture as a primary determinant of physician productivity. Also, it should be noted that of the 9 groups in the sample that maintained a predominantly equal-shares compensation system, all but 1 were comprised of 1 or 2 medical specialties, which also might reflect more uniformity of culture in these groups compared with more diverse multispecialty groups.

The data in **Table 7** display modest differences between the mostly production and mostly salary groups—for both physicians and practice leaders—in the share of respondents mentioning group or cultural factors as primary productivity drivers. This result is somewhat surprising since individual production-based compensation has “self-enforcing” productivity incentives not present under salary arrangements. Perhaps the marked emphasis on group collegiality, informal norms, and culture under equal-shares compensation is the result of the explicit focal point provided by the compensation-sharing mechanism.

**Table 6.** Factors That Drive Physician Productivity

Factor	Percentage				
	California	Oregon	Washington	Wisconsin	Total
<b>Panel A: Physician Perceptions</b>					
Compensation/financial incentives	15	25	50	40	34
Demand-side factors	77	67	44	60	60
Infrastructure and systems	85	75	72	80	77
Individual physician and/or group characteristics	39	75	67	50	59
<b>Panel B: Leader Perceptions</b>					
Compensation/financial incentives	57	64	65	67	63
Demand-side factors	36	43	40	8	33
Infrastructure and systems	71	50	60	92	67
Individual physician and/or group characteristics	86	93	85	83	87

Table 8 suggests leaders' perceptions of the (absolute) importance of method of compensation for physician productivity are internally consistent with the actual methods predominant in their groups: importance of the method of compensation is ranked in the same order as the extent to which compensation is linked to individual production (production is ranked highest, then equal shares, and finally salary). Thus, if there is a paradox raised by Table 7, 1 plausible explanation is that leaders perceive *both* culture and incentives to be primary drivers of productivity under equal-shares compensation.

### Evolution of Compensation Methods

Another key theme identified by the reviewers is that compensation methods appear to evolve over time, but they do not necessarily follow a distinct pattern. Comparison of Tables 9 and 10 suggests that compensation methods in California and Oregon—which had moved toward increased production incentive within the past 5 years—are now being adjusted somewhat toward reduced production incentive. In Washington, by contrast, there appears to be a moderate trend toward reduced production incentive. Wisconsin medical groups, having moved toward decreased production incentive during the past 5 years, are now contemplating some increase in production incentive. Thus, except for Washington, the trend seems to be toward the middle—that is, more of a balance between production-based and other incentives.

The interview transcripts also suggest that groups tend to add a productivity bonus to equal-shares or pure salary systems and then migrate to systems based

**Table 7.** Physician and Leader Perceptions of the Primacy of Group Factors in Determining Physician Productivity

Compensation Method (> 50%)	Percentage of Respondents Who Identified Group Factors as Primary Factors in Physician Productivity*	
	Physician	Leader
Mostly production	13	27
Mostly salary	14	33
Mostly equal shares	62	50

\*Group factors included group culture, teamwork, peer pressure, collegiality, and organization.

**Table 8.** Leader Perceptions of Importance of Compensation Method for Physician Productivity

Compensation Method (> 50%)	Mean Rating by Leaders of Importance of Compensation Method*
Mostly production	4.20
Mostly salary	3.50
Mostly equal shares	3.81

\*Rated on a scale of 1 to 5.

**Table 9.** Groups That Have Changed Compensation Method Within 5 Years and Nature of That Change

Nature of Change	California	Oregon	Washington	Wisconsin	Total
Groups that have changed method	6/12	4/11	5/13	4/10	19/46
Change represents an increase in individual production incentive	4/6	3/4	1/5	0/4	7/19
Change represents a decrease in individual production incentive	1/6	0/4	2/5	3/4	6/19
Other (eg, change in productivity metric)	1/6	1/4	2/5	1/4	6/19

purely on individual production for purposes of enhancing physician productivity and organizational revenue. After an initial period of "success" with these systems, groups find it necessary to modify production metrics (eg, from gross charges to collections to resource-based relative value scale measures) in order to address concerns about fairness expressed by physicians who feel that the production system and/or metrics fail to reflect their true work effort or contribution to the group's success.

However, even with modified production metrics in place, many groups with compensation based purely on individual production add a bonus component to:

- Tie compensation to group financial performance and profitability;
- Encourage activities that provide nonfinancial benefit to the group such as committee service, citizenship, and teamwork; and/or
- Encourage behaviors other than individual production that affect group performance, such as effective utilization management, clinical outcomes, and attention to patient satisfaction.

**Table 11** shows that groups with compensation based on individual production often have a bonus already in place or are planning to implement a bonus system based on the factors outlined above. Groups using equal-shares compensation methods typically do not utilize bonus arrangements to complement their compensation systems. Groups that do use bonuses appear to base these bonuses on similar criteria regardless of whether the core compensation system is salary based or production based.

... DISCUSSION ...

Physicians are hesitant to admit that they are personally affected by financial incentives, especially in terms of the influence of financial incentives on their behaviors that directly impact patient care. However, when asked to comment on specific scenarios about the behavior of other physicians outside their medical group, many will suggest that there are direct, and sometimes adverse, relationships between financial incentives embedded in compensation systems and physician behavior.

A clear majority of the physicians sampled in this study perceive that production-based compensation arrangements frequently lead physicians to avoid seeing capitated patients. Presumably this is because production formulas may not reward them for

encounters that are not fee-for-service or that do not somehow generate revenue. Not only is there no revenue gained for the time spent on a capitated encounter, the revenue that could have been generated by a fee-for-service encounter is lost.

Similarly, a clear majority believes that dumping of difficult or complex cases commonly occurs under production-based compensation. Possibly this is due to the fact that incentives under production-based systems are not well adjusted for severity or complexity and tend to reward volume of patients seen first and foremost. Hence, extra time and effort spent on such patients go largely unrewarded by the compensation system, and this time carries an opportunity cost in revenue that would have been generated seeing additional patients who have less complex conditions.

Finally, an overwhelming majority feels that capitation-based compensation systems lead to inappropriate underutilization of medical services and that this phenomenon occurs at least somewhat commonly. Physician incentives under capitation of the individual physician are strongly inclined to encourage restraint in utilization. However, these same incentives can act to discourage appropriate utilization of services.

Although the patterns of response exhibited by medical group leaders regarding the nature of the influences of compensation incentives on specific physician behaviors are similar to those of physicians, group leaders assign substantially more importance to compensation. Many of the leaders did not suggest that financial incentives significantly impact the patient care-related decisions and behaviors of physicians, but in many cases they did respond that compensation incentives exert strong and direct influences on physician productivity and work effort.

These findings appear to be consistent with those of previous empirical studies of the relationship between physician compensation method and productivity, which found that migrating physician compensation arrangements away from pure individual fee-for-service-based production toward fixed salary-based compensation reduces physician effort dramatically.<sup>1,4</sup>

In the quantitative secondary analysis component of the research project that includes this key informant substudy, the investigators examined actual productivity, compensation method, and physician characteristics for a large national sample of medical groups and their physicians, using Medical Group Management Association data



(Conrad D, Sales A, Chaudhuri A, Liang S, Maynard C, The impact of financial incentives on physician productivity in medical groups, University of Washington, Seattle, WA, working paper, July 2000).<sup>3</sup> The results of that quantitative analysis of actual production data support a major theme of this study of key informant perceptions: an increased share of individual production-based compensation leads to increased physician productivity. The quantitative study finds that several other factors also significantly influence physician productivity: physician experience, physician gender, the availability of capital and nonphysician labor, and ownership form of the medical group.

Physician and medical group leader opinions regarding other key determinants of physician productivity varied widely, although it would appear that demand-side factors, physical work environment (systems and infrastructure), individual physician characteristics, and medical group culture all have direct and significant impacts on individual physician productivity. Previous studies—for example, those of Kralewski and colleagues of medical groups in the upper Midwest—have revealed the significance of structural attributes and culture in the functioning of the physician organization.<sup>5,6</sup>

These interview findings also provide insight into the key factors that determine the types of physician compensation methods utilized by medical groups. Medical groups that maintain compensation systems based primarily on group performance (salary or equal shares) over the long term appear to place a relatively strong emphasis on group culture. This might imply that certain types of groups—small, single-specialty groups in particular—are natural candidates for relying on group culture as the primary means of regulating physician behavior, particularly productivity.

Larger and more diverse multispecialty groups have mostly migrated to compensation systems based in large part on formal monitoring of individual productivity. This might suggest that once group culture fails as a mechanism to encourage high productivity and group success, providers and leaders can and should expect the compensation method to become more complex as the group ties individual to group compensation more closely.

Also, groups planning to switch to a production-based method should recognize potential adverse effects on group performance and the need to develop an appropriate bonus system, variable pay component, or other administrative mechanism to prevent or at least minimize such unintended

consequences. In an era of managed care, groups with production-based compensation are tailoring compensation methods to support effective utilization management and incentives aligned with risk-based payment.

Precisely what mix of compensation based on individual production, fixed salary, and other incentives is necessary to optimize productivity and group performance? Which administrative structures and processes best complement different incentive compensation arrangements? Does such an optimum mix of incentives, administrative structures, and processes exist for any given group? The answer is unclear, but this study has attempted to point toward the most fruitful areas for future empirical work in this area.

### Study Qualifications

Several qualifications to this study should be noted. The overall study sample was selected using a purposive “snowball” sampling technique. Participant recruiting was an iterative process, requiring multiple contacts with organizations and individuals within organizations to identify and successfully recruit appropriate key informants to participate in interviews. Recruiting continued until minimum participation standards were met (ie, 20 medical groups per state with at least 1 physician and 1 leader interview per group). Thus, response rate was not a primary concern, and calculating such a response rate would be very difficult, if not impossible.

The physician key informants were typically chosen by the leader key informants (eg, chief executive officer, medical director, or administrator), which may have led to selection bias. Our selection criteria for physician key informants were that they maintain an active clinical practice at least part-time (eg, no full-time physician administrators) and that they have some familiarity with the group's compensation system. Many of the physicians interviewed were members or leaders of their group's compensation committee. It is possible that the leaders recommended physicians who were more sympathetic with their own views or political stances on compensation issues.

As a heuristic check of whether certain differential characteristics of the physicians might alter the interpretation of study findings, we performed ordinary least-squares regression and examined bivariate plots of the relationship between (1) the individual physician factors of gender, clinical experience, and years in the group and (2) the respondent physician's ranking of physician productivity under

different compensation methods. The scatterplots and regression coefficient signs suggested 2 interesting nuances in this sample: more experienced physicians were *less* likely to associate production-based compensation with the highest levels of productivity; however, holding physician experience constant, physicians with longer tenure in their current medical group tended to rank production-based compensation more highly as a positive influence on productivity. Given the relatively small number of female physicians in our sample (6 of 53), it is not surprising that there were no apparent differences in these perceptions by gender. These caveats suggest caution in generalizing the results of this qualitative

study and indicate the need for larger, stratified, random samples of medical groups and physicians before drawing firm conclusions.

The study also is limited by the usual limitations inherent in all qualitative research. Open-ended questions, while useful in exploring subtle nuances of issues, are subject to interviewer bias. Informants' responses may have been influenced by the probes of the interviewers, who have their own biases about what information is relevant or important. And the responses themselves are limited to *self-reported perceptions and opinions* of leaders and interviewers, not *factual evidence* in the strictest sense of the term.

Also, it is important to highlight that the conclusions of this qualitative study are by no means offered as "proof," but are rather mostly descriptions and interpretations of the findings. The strengths of qualitative research lie in the domain of theory building and hypothesis generation, not hypothesis testing *per se*.

... CONCLUSION ...

In summary, the interview responses offered by physicians and medical group practice administrative leaders yielded many valuable insights regarding the nature of the perceived relationships that exist between physician compensation methods and indi-

**Table 10.** Groups That Anticipate a Change in Compensation Method and Nature of That Change

Nature of Change	California	Oregon	Washington	Wisconsin	Total
Groups anticipating a near-term change	4/12	4/11	6/13	5/10	19/46
Change represents an increase in individual production incentive	0/4	2/4	1/6	2/5	5/19
Change represents a decrease in individual production incentive	3/4	2/4	3/6	1/5	9/19
Change represents other (eg, change in productivity metric)	1/4	0/4	2/6	2/5	5/19

**Table 11.** Groups With a Bonus Planned or Implemented Based on the Factors Listed Below

Compensation Method	Utilization, Cost Effectiveness, or Capitation to Individual Physician/Panel Size		Patient Satisfaction, Quality of Care, Committee Membership, or Citizenship		Factors Listed in Either of Previous 2 Columns	
	Physician	Leader	Physician	Leader	Physician	Leader
Production	10/38	13/44	18/38	17/44	19/38	22/44
Salary	0/7	2/9	1/7	4/9	1/7	4/9
Equal shares	0/8	0/8	0/8	0/8	0/8	0/8

vidual physician productivity and other practice behaviors. Several of the issues highlighted by this study warrant further empirical research.

**Acknowledgments**

The authors would like to thank the staff and leadership of the Medical Group Management Association (MGMA) and the MGMA Center for Research—Neill Piland, Lisa Pieper, Jim Margolis, Dave Gans, Laurel Weinstein, and Kerstin Lynam—for their assistance and support with key informant recruiting activities. We also would like to thank The Robert Wood Johnson Foundation's Changes in Healthcare Financing and Organization Initiative and our project officer, Amy Bernstein, ScD, for supporting this work, as well as the Robert Wood Johnson Foundation Clinical Scholars Program, of which Dr. Schellhase was a member while working on this project.

---

... REFERENCES ...

1. **Gaynor M, Gertler P.** Moral hazard and risk spreading in partnerships. *RAND J Econ* 1995;26:591-613.
2. **American Medical Association.** *Medical Groups in the US: A Survey of Practice Characteristics.* Chicago, IL: American Medical Association; 1996.
3. **Medical Group Management Association.** *Physician Compensation and Production Survey: 1997 Report Based on 1996 Data.* Englewood, CO: Medical Group Management Association; September 1997:28-50.
4. **Gaynor M, Pauly MV.** Compensation and productive efficiency in partnerships: Evidence from medical group practice. *J Political Economy* 1990;98:544-573.
5. **Kralewski JE, Pitt L, Shatin D.** Structural characteristics of medical group practices. *Administrative Sci Q* March 1985;30:34-45.
6. **Kralewski JE, Wingert TD, Barbouche MH.** Assessing the culture of medical group practices. *Med Care* 1996;34:377-388.