

What Do Physician Recommendations of Health Plans Mean?

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Objective: To examine what determines physician recommendations of health plans and whether their recommendations reflect experiences with specific plans.

Study Design: Cross-sectional mail and telephone survey.

Participants and Methods: A sample of 11 453 physicians was surveyed from November 2000 to early 2001, and 3798 (2105 generalists, 1693 specialists) responded. After adjusting for ineligibles and duplicates, the response rate was estimated to be between 41% and 45%. Physician respondents were from 23 health plans in 5 regions: Florida, New York, Colorado, Pennsylvania, and Washington. Plans included those serving commercial, Medicare and Medicaid populations and represented group/staff type HMOs, independent practice associations, and preferred provider organizations. Measurements included self-reported experience with 9 health plan care management strategies and ratings of managed care beliefs and satisfaction with pay. Physicians were asked about their willingness to recommend the health plan to a family member or friend, to people with serious illnesses, or to other physicians.

Results: Physician recommendations of a health plan were associated with the health plan's care management activities and with the physician's generalized beliefs about managed care and satisfaction with pay.

Conclusion: Physician health plan recommendations can reasonably be interpreted as partially reflecting physician experiences with specific plans. Therefore, they can play a role in helping purchasers and consumers compare health plans.

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expertise and their unique position mediating between the health plan and patients, physicians are another potential important source of information on health plans.^{2,4,8,9} Because of their position, physicians have the opportunity to directly evaluate the effects of health plan policies and procedures. For this reason alone, physician health plan recommendations have strong face validity.

Although it seems reasonable that physician recommendations reflect their experience with specific health plans, an alternative argument is that physician recommendations are simply a function of their general beliefs about the efficacy of managed care. If this is the case and physician health plan recommendations do not, in large part, reflect their experience with specific health plans, these recommendations are of questionable usefulness in comparing health plan performance.

In this paper, we examine how physician recommendations regarding a specific health plan are affected by experience with that health plan and general beliefs about managed care efficacy. We also report how a physician's characteristics and practice setting affect recommendations of health plans. Because generalist and specialist physicians relate to and experience health plans in substantially different ways, with generalists often taking primary care or gatekeeping roles, the analyses are done separately for generalists and specialists.

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Health plans manage healthcare in a wide variety of ways, such as providing disease management programs, utilization review, initiatives for prevention and for chronic disease management, and physician payment incentives.¹⁻⁴ Perceived differences among health plans have led to purchaser, regulator, and consumer measures of health plan performance that allow comparisons among health plans.⁵⁻⁷ Because of their professional

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BACKGROUND

Our work builds on previous research that explored the influences on physician recommendations of health plans. Several studies have reported whether physicians would be willing to recommend a health plan to a friend or family member^{2,10-14} or to colleagues,^{11,14} or whether they themselves used or would use a health plan.^{10,15,16} Smith et al examined how different components of health plan care management strategies affected physicians' willingness to recommend a health plan to a friend or family member.¹³ They found that physicians' willingness to recommend a health plan was positively influenced by what health plans do to facilitate care (eg, profiling and patient reports, guidelines, patient education) and negatively influenced by plan processes perceived to be barriers to care (eg, authorization processes, cost-containment pressures). Their results suggest that barriers had a larger negative effect on plan recommendations for individuals with chronic health conditions. They also found that the larger the percentage of a physician's patients in the plan, the greater the likelihood that the physician would recommend the health plan.¹³ In a similar study, Williams et al hypothesized that plan management strategies would affect physicians' evaluations of health plans.¹⁴ In a survey of primary care physicians affiliated with 5 large health plans (1336 returned usable surveys out of an initial sample of 2392), physicians were asked whether they would recommend the plan to colleagues, patients, and family members. Having to comply with administrative rules (eg, authorization, utilization review) was negatively associated with physician recommendations.

Some research on physician health plan recommendations uses recommendations to compare health plans. Cassidy et al used recommendations from physicians and office managers to rank-order health plans.¹⁰ Physicians and office staff were surveyed as to their beliefs about various aspects of 10 specific health plans. For physicians, questions included perceptions about patient satisfaction and about plan mental health coverage; for office managers, questions related to payment and certification issues. There was significant rank-order agreement between the physicians' and the office managers' plan ratings, and the ratings differed across plans. Aseltine et al used physicians' willingness to recommend a health plan to track whether physicians' assessments of 5 particular health plans improved or declined over time.¹¹ In 1999, physicians were surveyed on their views regarding plan facilitation of

patient care (eg, availability of subspecialists for referrals), plan policies and practices (eg, ease of obtaining referral authorization), and health plan recommendations to a colleague and a family member. Physicians generally agreed that they would recommend each of the 5 health plans to a colleague and a family member. For willingness to recommend a plan to a colleague, on a 5-point scale with 3.00 being neutral, the highest score for a plan was 3.72. For willingness to recommend to a family member, the highest score for a plan was 3.66. For all 5 health plans, physicians' willingness to recommend them to colleagues and family members declined from 1996 to 1999.

Although this research provides some insights about physician health plan recommendations, there are 2 difficulties with interpreting the results. First, while the research shows how some health plan policies and procedures can influence physician recommendations, other factors may come into play as well, such as norms,¹⁴ general beliefs about managed care, demographics, practice characteristics, and satisfaction with pay. If these factors are correlated with health plan policies and procedures (eg, disease management, authorization) and are omitted from the analysis, the estimates of the effects of the health plan policies and procedures on recommendations will be biased.

The second major difficulty is understanding what physician health plan recommendations mean. One explanation, which we call the managed care reaction model, is that they reflect a physician's exposure to, and experience with, the policies and procedures associated with specific health plans. Another explanation, which we call the managed care receptivity model, is that they are a function of a physician's generalized beliefs about managed care.

The managed care reaction model argues that physicians' beliefs about managed care and satisfaction with pay are a consequence of their experience with the policies and procedures of health plans. The reaction model suggests that physicians' experience with plan policies and procedures affects their beliefs about managed care efficacy. The managed care receptivity model argues that physicians have generalized beliefs about managed care and earnings expectations, which affect their receptivity to plan policies and procedures. The receptivity model suggests that physicians who have pro-managed care beliefs are more likely to have positive experiences with plan policies and procedures.

We assessed these arguments by estimating 3 different models for physician recommendations of

specific health plans: (1) a model that contained managed care beliefs and controls, (2) a model that contained plan policies and procedures and controls, and (3) a model that contained all variables. The first 2 models can be interpreted in a manner similar to bivariate analyses, showing the effects of managed care beliefs and experience with health plan policies and procedures without controlling for correlated effects; and model 3, the full model, can be interpreted in a manner similar to a multivariate analysis, showing the effects of managed care beliefs and experience with plan policies and procedures while controlling for correlated effects. We used these results to interpret what physician recommendations of health plans mean.

METHODS

Study Design, Population, and Sample

From November 2000 to early 2001, a total of 11 453 physicians were asked to report on their experiences in 23 health plans in 5 states: Florida, New York, Colorado, Pennsylvania, and Washington. Some physicians were asked about commercial patients in a referent plan, and others were asked about Medicare or Medicaid patients. We worked with purchaser partners in each region, along with health plans, to obtain lists of physicians associated with plans. Once duplicate entries had been eliminated, each physician was assigned a unique identifier and the data were pooled for all plans in the site.

We sought 140 completed interviews with primary physicians and 140 with specialty care physicians per plan. We made the assumption that a response rate of 55% to 60% was realistic.¹⁷ Therefore, a sample size of 240 to 250 each of generalist and specialist physicians in each plan was planned. For physicians listed in multiple plans, we sampled using an algorithm to properly assign them to a group based on the number of plans the physician was in and the a priori sample size requirements.¹⁸ (We adapted the sampling procedure to take into account our need to assign physicians who provided both primary and specialty care to a single category within a plan and to provide minimum, rather than optimal, sample sizes.) Because response rates were lower than expected in the first 3 sites (Florida, New York, and Colorado), larger samples of approximately 300 physicians of each type per plan were drawn in the 2 remaining sites (Pennsylvania and Washington). Overall, 194 to 300 physicians per health plan were

surveyed. Mail and telephone mixed-mode survey administration was utilized in this study, with an experiment incorporated into the administration design to evaluate different modes of follow-up administration.¹⁹

The total number of physicians responding was 3798. The sample response rate for the survey was 36%, with a generalist response rate of 39% and specialist response rate of 32%. Response rates for health plans ranged from a low of 22% in a Medicaid and a Medicare health plan to a high of 61% in a large group/staff model HMO. These overall response rates are conservative estimates because the denominator used in the calculations was the total number of physicians sampled from a health plan list. Our telephone interviews suggest that the sampling lists, as provided by health plans, included physicians who were not associated with the health plan and individuals who were not physicians. The reliability of the lists varied across states and by type of health plan. Group/staff plan lists tended to be better, and Medicaid plan lists were worse. Taking this variation into account, we estimated that the overall response rate for eligible physicians (those that a telephone survey would show were associated with a health plan) was between 41% and 45%. Cases that had missing values for the dependent or independent variables were deleted, resulting in 1182 generalists and 859 specialists being included in the analysis.

We assessed whether nonresponse was associated with the volume of patients a physician had with a health plan by obtaining claims data for all physicians surveyed in 2 of the 23 health plans in the study. Using logistic regression, we regressed response on the number of the plan's members that the physician saw during the year before the survey, the number of those members for whom the physician provided care during a hospitalization, and the dollar amount that the physician was reimbursed for the services that he or she provided on behalf of the health plan. None predicted nonresponse. This suggests that nonresponse was not associated with volume.

Questionnaire Design

We used a survey instrument grounded in a conceptual framework for physician measurement of health plan quality^{4,9} and demonstrated to have strong reliability and validity.²⁰ The survey addresses 3 resource areas: physician office-based practice, pharmacy practice, and hospital practice. In these 3 areas, we asked about the physician's experience with specific health plan policies and procedures. Physicians may have contracted with more than 1

health plan, and they were instructed to answer these survey items only with respect to patients in the referent health plan from which they were sampled. Items on managed care beliefs and on physician and practice characteristics were included in the survey for use as control variables in subsequent analyses.

Health Plan Recommendation

The survey used 3 items to evaluate physician health plan recommendation: (1) I would recommend [PLAN] to a family member or friend; (2) I would recommend [PLAN] to people with serious illnesses; and (3) I would recommend participating with [PLAN] to other physicians. Each was assessed by using a 4-point scale (strongly disagree to strongly agree). Because the Cronbach α for the 3 items was .94, we used the average of the 3 items in the analysis. (Smith et al reported that the effects of barriers and facilitators differed among these items, with barriers having a larger negative effect on recommendations to persons with chronic or serious illness than on recommendations to family or friends, so we estimated separate models for each of the 3 recommendation measures. Because we found no differences in the estimates across the 3 dependent variables, we reported only the results for the combined variable.)

Physician Demographics and Practice Characteristics

The survey collected information on respondent age, tenure in medicine, sex, board certification, race/ethnicity, type of practice, hours worked each week, practice organization (solo, single-specialty group, multispecialty group), number of patients seen on an average day, and whether the physician was paid for administrative work. The physician–health plan relationship was measured by years as a provider with the plan, physician estimate of the percentage of her/his patients in the referent plan, and the number of other health plans with which the physician was contracted.

Health Plan Policies and Procedures

Physicians were asked about their experience with various health plans' policies and procedures. On the basis of the relationships posited between health plans and physicians,⁴ these were grouped into the categories of *care management* (guidelines, disease management programs, reminder information about ongoing care needs of patients, potential drug interactions), *authorization* (authori-

zation requirements for specialist referral or hospital admission, off-formulary drug authorizations), *profiling* (reports on resource use; provision of quality of care such as immunization, mammography, blood sugar levels, and blood pressure levels; patient satisfaction reports), *training* (opportunities for continuing medical education or education on avoidable hospital admissions), and *health plan interaction* (the plan seeks the physician's views on formularies and hospitals). (Disease management and guidelines were measured using a scale of "not available," "available—do not use," and "use.")

Managed Care Beliefs and Satisfaction With Pay

Managed care beliefs were assessed by asking physicians about their general perceptions of the effect (on a 3-point scale; decrease, no effect, increase) of managed care on the likelihood of patients getting preventive services; the use of practice guidelines and disease management protocols; the quality of healthcare for people who are sick; the amount of time spent with patients; and the ability of patients to receive referrals, drugs, and tests they need. Overall beliefs about managed care were measured by asking physicians about their perceptions of the impact of managed care (on a 5-point scale; mostly negative to mostly positive) on the way they practiced medicine and on the care they provided to their patients.

Two managed care belief scales were developed: beliefs about the effect of managed care on care processes and beliefs about the effect of managed care of medical practice.²⁰ Satisfaction with compensation was measured with items rated on 4-point scales (very dissatisfied to very satisfied) for satisfaction with the timeliness of reimbursement and satisfaction with the level of reimbursement from the health plan. The Cronbach α values for the scales were strong, ranging from .75 to .88.

Other Controls

Part of the study compared the use of telephone plus mail survey follow-up with mail-only survey follow-up. Therefore, a control variable was included for the mail mode.

Data Analysis

Responses were averaged for health plan practice items that asked about physician experience in more than 1 resource or practice area. For example, for reminders we averaged a physician's responses to questions about receiving reminder information about a patient's ongoing care needs and about

Table 1. Physician Characteristics

Characteristic	Generalist (n = 1182)		Specialist (n = 859)	
	Mean	SD	Mean	SD
Demographics				
Age (y)	46.99*	9.88	47.97	9.26
Years in medicine	19.45 [†]	10.33	21.08	9.70
Male	.71 [†]	.45	.84	0.37
Board certified	.91 [†]	.28	.95	.21
Latino or Hispanic origin	.08*	.27	.06	.23
Race				
White	.81 [†]	.39	.90	.30
Black or African American	.03*	.16	.01	.18
Asian/Pacific Islander	.09*	.29	.07	.23
Other	.07 [†]	.25	.02	.14
Practice setting				
Solo practice	.25	.43	.28	.45
Single-specialty group	.42	.49	.40	.50
Multispecialty group	.33*	.47	.28	.45
Hours worked per week	46.07 [†]	13.88	51.16	14.38
Patients seen per day (n)	22.88*	7.98	21.88	12.76
Does paid administrative work	.24	.43	.21	.41
Plan relationship				
Years with plan (n)	7.46	.44	7.49	.39
Patients in plan				
Fewer than 1%	.08	.27	.08	.28
1%-5%	.26 [†]	.44	.32	.47
6%-10%	.24	.43	.26	.44
11%-25%	.17	.37	.14	.35
More than 25%	.26 [†]	.44	.20	.40
Additional health plan contracts				
Zero	.18	.38	.15	.36
One	.03*	.14	.01	.10
Two	.03	.18	.03	.17
More than two	.77*	.42	.81	.39

* $P \leq .05$ for differences between generalists and specialists.

[†] $P \leq .01$ for differences between generalists and specialists.

receiving information on potential drug interactions for specific patients. For resource use reports, we averaged a physician's responses to questions about receiving resource use reports regarding specialist referrals, drug use, and hospital use. We used the Student *t* test to test for differences between generalists and specialists. Multiple linear regression models were used to test the independent effects on health plan recommendations of physician assessments of health plan policies and procedures, physician and practice characteristics, the physician–health plan relationship, managed care beliefs, and satisfaction with pay. We included HMO

model type as a control in the regressions. All the regressions included a random effect for health plan and used the Huber-White sandwich estimator for errors.²¹

We estimated separate models for primary care/generalist physicians and specialists because they relate to health plans in substantially different ways. This allowed the effect of the independent variables (eg, health plan relationships) to differ between the 2 groups.

RESULTS

Sample Description

Table 1 contains data on the respondents. Although there were few substantive differences in practice characteristics, generalist physicians were more likely than specialists to be in multispecialty groups (33% vs 28%). Generalists worked fewer hours per week (46 hours vs 51 hours) and saw more patients per day (23 patients vs 22 patients). More than 20% of both generalists and specialists were paid for administrative work (24% vs 21%).

With respect to plan relationship, both generalists and specialists had contracted with the referent plan for an average of 7 years; however, compared with specialists, generalists had a greater percentage of their patients enrolled in the plan. Specialists were more likely to contract with more than 2 health plans (81% vs 77%).

Health Plan Policies and Procedures

Table 2 presents differences between generalists and specialists with respect to their experiences with health plan policies and procedures. Generalists were more likely than specialists to have clinical guidelines available from the health plan and

use them (2.37 vs 1.81); to have disease management programs available from the health plan and use them (2.22 vs 1.63); to use reminders about ongoing care needs for patients or receive information about potential drug problems (49% vs 25%); to receive reports on resource use (36% vs 19%); to receive quality reports on patient care and patient satisfaction (39% vs 13%); and to have educational opportunities provided by the plan (21% vs 12%). Both generalists and specialists reported a similar rate of prior authorization requirements for specialist referrals and/or hospital admissions (61% vs 60%); however, specialists requested off-formulary drugs less often than generalists. It was uncommon for health plans to seek either generalist or specialist views on its pharmacy policies or on the quality of contracted hospitals (10% vs 9%).

Managed Care Beliefs, Satisfaction With Pay, and Health Plan Recommendation

Table 2 also compares managed care beliefs, satisfaction with pay, and health plan recommendations for generalists and specialists. Generalists and specialists' responses to the questions about the effect of managed care organizations on quality of care were slightly more negative than the "no effect" response, with generalists rating the effect of managed care on care processes slightly higher than specialists (1.81 vs 1.63). Although all physicians were "somewhat dissatisfied" with the overall impact of managed care on medical practices, generalists were more satisfied than specialists (2.60 vs 2.18). This may be due either to specialists having higher income expectations or managed care affecting specialist incomes more than generalist incomes.

Physicians were between "somewhat dissatisfied" and "somewhat satisfied" with the timeliness and level of health plan reimbursement. Generalists rated satisfaction with pay higher than specialists (2.61 vs 2.33).

Physicians were between "somewhat disagree" and "somewhat agree" with the statements that they would recommend the health plan. Generalists were more likely to recommend the health plan than specialists (2.60 vs 2.39 on a 4-point scale).

Determinants of Health Plan Recommendations

Table 3 (generalists) and Table 4 (specialists) show estimates of the effects of health plan policies and procedures; physician characteristics, work setting, and relationship with the plan; managed care beliefs; and satisfaction with pay on physician health plan recommendations. To examine the effect of

managed care beliefs and plan policies and procedures on health plan recommendations, 3 models were estimated: a model without beliefs, a model without policies and procedures, and a model including both.

For generalists (Table 3), the results showed that experience with plan policies and procedures affected physicians' recommendations of health plans. In the model without managed care beliefs, 6 of the 9 health plan policies and procedures had significant effects (disease management, reminders, not having to obtain authorization, not requesting off-formulary drugs frequently, continuing medical education opportunities, and the plan seeking physician views). In the model without experience with plan policies and procedures, the 2 managed care beliefs, effects, and satisfaction with pay all had significant effects. In the full model, only 2 of the plan policy and procedure effects were significant; however, the effects of the 2 managed care beliefs and satisfaction with pay remained significant. The latter 3 effects were of a magnitude similar to that in the model that omitted measures of physician experience of plan policies and procedures. In contrast, the coefficients for the 2 remaining significant policies and procedures were smaller.

These results suggest that there is a significant correlation between managed care beliefs and physician experience with the policies and procedures of the referent plan and that managed care beliefs are the stronger determinant of physician recommendations of a health plan. However, the significance of policies and procedures in the full model and their effects in the model without managed care beliefs show that physicians' recommendations of a health plan are associated, to some degree, with their experience with the plan's policies and procedures.

For specialists (Table 4), the results were similar; the same factors (with the exception of reminders) were significant in the model without managed care beliefs and satisfaction with pay.

For all physicians, disease management, not having to obtain authorization, and continuing medical education opportunities were associated with more positive recommendations of health plans. For generalists, reminders, not requesting off-formulary drugs frequently, and the plan seeking physician views also were associated with more positive health plan recommendations.

There were relatively few demographic effects, with the exceptions being that Latino generalists were more likely to recommend a health plan and board-certified specialists were less likely to rec-

Table 2. Descriptive Statistics for Health Plan Policies and Procedures, Managed Care Beliefs, Satisfaction with Pay, and Willingness to Recommend a Health Plan

Health Plan Policy or Procedure	Generalist		Specialist	
	Mean	SD	Mean	SD
Care management				
<i>Guidelines:</i> Do you use clinical guidelines for your patients?*				
(1 = not available; 2 = available, do not use; 3 = use)	2.37 [†]	.73	1.81	.83
<i>Disease management:</i> Do you use disease management for your patients?*				
(1 = not available; 2 = available, do not use; 3 = use)	2.22 [†]	.80	1.63	.77
<i>Patient-specific reminders:</i> Do you receive reminder information about ongoing care needs* or patient-specific information on drug interactions, efficacy, and dosage levels for your patients? [‡]				
(1 = yes; 0 = no)	.49 [†]	.39	.25	.35
Authorization				
Is authorization required from plan for referrals and/or hospital admission? ^{*,§}				
(1 = no; 0 = yes)	.61	.28	.60	.33
In the past 6 months, how frequently did you request an off-formulary drug? [‡]				
(1 = several times a week; 2 = about once a week; 3 = 2-3 times a month; 4 = about once a month; 5 = less often than once a month; 6 = never)	3.91 [†]	1.55	4.44	1.62
Profiling				
Do you receive reports on use of resources? ^{*,‡,§}				
(1 = yes; 0 = no)	.36 [†]	.34	.19	.26
Do you receive reports on quality of care and/or patient satisfaction issues? ^{*,‡,§}				
(1 = yes; 0 = no)	.39 [†]	.44	.13	.28
Training				
Does plan provide opportunities for continuing education? Received training on preventing avoidable hospital admissions? ^{*,§}				
(1 = yes; 0 = no)	.21 [†]	.29	.12	.23
Health plan interaction				
Does plan seek your views on its policies? ^{*,‡,§}				
(1 = yes; 0 = no)	.10	.25	.09	.24
Managed care beliefs				
<i>Effect of managed care on care processes</i>				
Do you think HMOs and other managed care plans have increased, decreased, or had no effect on: likelihood of patients getting preventive services, use of practice guidelines and disease management protocols, quality of healthcare, amount of time with patients, ability of patients to get referrals, drugs, and tests they need?				
(1 = decreased; 2 = no effect; 3 = increased)	1.81 [†]	.44	1.63	.39
<i>Effect of managed care on medical practice</i>				
Overall, do you think managed care has had a mostly positive, somewhat positive, neutral, somewhat negative, or mostly negative impact on the way you practice medicine and the services you provide to your patients?				
(1 = mostly negative; 2 = somewhat negative; 3 = neutral; 4 = somewhat positive; 5 = mostly positive)	2.60 [†]	1.17	2.18	1.10
Satisfaction with pay				
How satisfied are you with the timeliness and levels of reimbursement you receive from the plan?				
(1 = very dissatisfied; 2 = somewhat dissatisfied; 3 = somewhat satisfied; 4 = very satisfied)	2.61 [†]	.87	2.33	.89
Willingness to recommend				
I would recommend [PLAN] to: a family member or friends; to people with serious illnesses. I would recommend participating with [PLAN] to other physicians.				
(1 = strongly disagree; 2 = somewhat disagree; 3 = somewhat agree; 4 = strongly agree)	2.60 [†]	.96	2.39	.95

*Asked for the provider (office) resource area.

[†] $P \leq .01$ for differences between generalists and specialists.[‡]Asked for the pharmacy resource area.[§]Asked for the hospital area.

ommend a health plan. However, the latter effect was only significant when managed care beliefs were not included. Practice characteristics had modest effects. For specialists, the greater the number of hours worked per week and the number of patients seen per day, the lower the recommendation of a health plan. Although the effect of hours worked per week also was negative for generalists,

it was not consistently significant at conventional levels.

Consistent with earlier research,¹³ physician–health plan relationships affected recommendations of health plans. The percentage of patients with the health plan had a strong positive effect on health plan recommendations for both generalists and specialists. Physicians in group/staff health plans made

Table 3. Regression Results for Determinants of a Physician’s Willingness to Recommend a Health Plan for Generalists

Health Plan Policy or Procedure	Without Beliefs		Without Policies		Full Model	
	β	t Test	β	t Test	β	t Test
Care management						
Guidelines	.036	.93			.022	.55
Disease management	.091*	2.35			.041	1.27
Reminders	.244*	4.10			.125*	2.21
Authorization						
Do not have to obtain authorization	.391*	3.43			.179	1.63
Do not request off-formulary drugs frequently	.103*	6.18			.051*	3.06
Profiling and reports						
Resource use reports	.003	.04			-.006	-.07
Quality reports	.011	.19			-.057	-1.19
Training						
Continuing medical education	.314*	2.84			.191	1.73
Plan interaction						
Plan seeks physician views	.369*	3.51			.139	1.54
Managed care beliefs and pay satisfaction						
Effect of managed care on care processes			.268*	3.54	.250*	3.59
Effect of managed care on medical practice			.144*	3.60	.117*	3.07
Satisfaction with pay			.461*	13.00	.418*	11.13
Physician demographics						
Physician age	.004	.55	.004	.82	.001	.22
Years practicing medicine	-.002	-.33	-.002	-.34	.000	.00
Male	.062	1.13	.036	.76	.035	.77
Board certified	-.140	-1.28	-.116	-1.16	-.119	-1.17
Latino	.179*	2.04	.174*	2.20	.148*	1.98
Black (Contrast: white)	-.251	-1.59	-.174	-1.35	-.176	-1.32
Asian (Contrast: white)	.118	1.52	.086	1.39	.069	1.18
Other (Contrast: white)	-.021	-.17	.043	.44	.036	.37
Physician practice organization						
Multispecialty group (Contrast: solo practice)	-.004	-.06	.044	.78	.060	1.12
Single-specialty group (Contrast: solo practice)	-.049	-.73	.046	.68	.037	.56
Hours worked per week	-.003	-1.43	-.002	-1.71	-.002	-1.39
Patients seen per day	.003	1.16	.002	.89	.002	.96
Does paid administrative work	.092	1.76	.062	1.43	.036	.85
Physician health plan relationship						
Years with plan	-.001	-.31	-.003	-.69	-.002	-.57
Patients in plan	.102*	3.48	.073*	3.03	.080*	3.30
Number of additional plan contracts	-.051	-1.07	-.003	-.07	.020	.38
Other controls and intercept						
Group/staff type HMO	.353*	2.48	-.030	-.17	-.042	-.21
Mail survey mode	-.022	-.18	-.157	-1.60	-.143	-1.47
Intercept	1.196*	3.45	.438	1.47	.086	.25

*P ≤ .05.

Table 4. Regression Model for Determinants of a Physician's Willingness to Recommend a Health Plan for Specialists

Health Plan Policy or Procedure	Without Beliefs		Without Policies		Full Model	
	β	<i>t</i> Test	β	<i>t</i> Test	β	<i>t</i> Test
Care management						
Guidelines	-.003	-.08			-.027	-.68
Disease management	.075*	2.04			.039	.95
Reminders	.101	1.22			.007	.09
Authorization						
Do not have to obtain authorization	.247*	3.44			.080	1.78
Do not request off-formulary drugs frequently	.065*	3.79			.013	.82
Profiling and reports						
Resource use reports	.224	1.82			.192*	2.09
Quality reports	.021	.17			-.165	-1.69
Training						
Continuing medical education	.463*	2.05			.316*	1.96
Education						
Plan seeks physician views	.247*	1.94			.065	.50
Managed care beliefs and pay satisfaction						
Effect of managed care on care processes			.195*	2.29	.190*	2.27
Effect of managed care on medical practice			.204*	4.54	.195*	4.51
Satisfaction with pay			.438*	12.23	.418*	12.23
Physician demographics						
Physician age	-.002	-.13	-.004	-.56	-.006	-.67
Years practicing medicine	.002	.14	.004	.63	.005	.69
Male	.091	1.28	.089	1.40	.085	1.28
Board certified	-.309*	-2.29	-.192	-1.68	-.222	-1.82
Latino	.034	.29	-.080	-1.00	-.077	-1.07
Black (Contrast: white)	.088	.36	.161	.60	.136	.48
Asian (Contrast: white)	.183	1.66	.180*	2.15	.161*	1.97
Other (Contrast: white)	-.229	-.97	-.093	-.53	-.127	-.72
Physician practice organization						
Multispecialty group (Contrast: solo practice)	.112	1.43	.080	1.42	.088	1.44
Single-specialty group (Contrast: solo practice)	.025	.30	-.018	-.24	-.001	-.01
Hours worked per week	-.008*	-5.56	-.003*	-2.30	-.003*	-2.39
Patients seen per day	-.005*	-2.76	-.003*	-2.06	-.003*	-1.95
Does paid administrative work	.046	1.00	.007	.14	-.002	-.04
Physician health plan relationship						
Years with plan	.001	.21	.003	.53	.003	.55
Patients in plan	.126	3.64	.107	3.74	.105*	3.80
Number of additional plan contracts	-.065	-1.84	.020	.96	.053	1.90
Other controls and intercept						
Group/staff type HMO	.379*	3.57	-.008	-.05	-.009	-.05
Mail survey mode	-.079	-.67	-.078	-.59	-.081	-.64
Intercept	2.132*	3.78	.709	1.56	.595	1.18

* $P \leq .05$.

stronger recommendations than physicians in independent practice association (IPA) and preferred provider organization (PPO) health plans.

Interpreting the Group/Staff and Managed Care Belief Effects

Prior research noted that physicians in group/staff

type HMOs are more likely to recommend a health plan.^{2,14} We evaluated 2 interpretations of this effect. The first interpretation argues that group/staff (G) plans are more likely to implement care management policies and procedures (P). A physician's positive experience with policies and procedures result in more positive beliefs (B) about the managed care effi-

cacy, which result in positive health plan recommendations (R). The model is denoted $G \rightarrow P \rightarrow B \rightarrow R$. We call this the group-effect model. The second interpretation argues that group/staff plans attract and recruit physicians with positive beliefs about managed care. The positive managed care beliefs support the group/staff plans in implementing care management policies and procedures and also cause positive health plan recommendations. G and B are correlated because of self-selection. The model is denoted $G \leftrightarrow B, G \rightarrow P, \text{ and } B \rightarrow R$. In this model, the effect of the group/staff type HMO on plan recommendation is spurious, being caused by self-selection of physicians. We call this the self-selection model. This argument is consistent with the argument that physicians self-select into solo practice or multispecialty groups as a function of their preference for the trade-off between hours of work and income.^{22,23}

What do the results show? First, both models imply that beliefs are strongly associated with recommendations, which is supported by the estimates in Tables 3 and 4. Therefore, further analysis is needed to discriminate between the 2 models. The group-effect model implies that the partial correlations of the group/staff type HMO with physician recommendation, when controlling for behaviors or controlling for policies and procedures ($r_{GR,B}$ and $r_{GR,P}$), are equal to zero because P and B intervene between G and R.²⁴ The self-selection model implies that $r_{GR,B}$ is equal to zero and does not make a prediction about $r_{GR,P}$. The estimates show that $r_{GR,B}$ is equal to zero for generalists and specialists and that $r_{GR,P}$ is equal to .353 for generalists and .379 for specialists. These results do not support the group-effect model prediction that group/staff plan policies and procedures are the sole cause of the group/staff effect. The results are consistent with the self-selection model predictions.

We performed some further analyses to understand the relationships better. Both the group-effect and self-selection models imply that there is a significant group/staff effect on care management policies and procedures. The strong self-selection argument goes further, though. It argues that the group/staff effect is spurious; it is due to recruiting the right physicians. This means that when managed care beliefs and satisfaction with pay are added to regressions of care management policies and procedures on group/staff and control variables, the group/staff indicator will become less significant. **Table 5** shows the test of this argument. The results support both the group-effect and self-selection arguments. Supporting the self-selection argument is

the decrease in the group/staff effect when managed care beliefs and satisfaction with pay were added to the models. The effect even became nonsignificant in 4 of the 9 models for both generalists and specialists. Supporting the group-effect model is the significant group/staff effect that remained after managed care beliefs and satisfaction with pay were added to the model.

Interestingly, satisfaction with pay was significant in every model. This is consistent with research that shows physician self-selection into plans involves a trade-off between hours worked and income. Perhaps income expectations among group/staff physicians are not as high as income expectations among physicians in other types of health plans. This would result in group/staff physicians being more satisfied with pay and being more receptive to care management policies and procedures. The impact of managed care on income may be a cause of managed care backlash among physicians in IPA/PPO types of plans, making them less receptive to care management policies and procedures.

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DISCUSSION

Our results show that physician recommendations of a health plan are a function of experience with the referent plan's policies and procedures, managed care beliefs, and satisfaction with pay. This means that physician health plan recommendations reflect, in part, how health plans manage care management processes. However, health plan recommendations also appear to be influenced by self-selection. Although the former suggests that physician health plan recommendations can be used to compare plans, the latter suggests care should be taken when doing such comparisons.

The results suggest, in particular, that caution should be exercised in comparing group/staff with IPA/PPO type plans. The results suggest that the observed positive recommendations of group/staff type plans found in other research^{8,14} are caused by 3 factors. First, group/staff plans are more likely than IPA/PPO plans to attract physicians who have positive overall views of managed care. Second, physicians in group/staff plans have a higher volume of patients with the referent health plan than physicians in IPA/PPO plans. Third, physicians in group/staff plans are more likely to report the presence of care management policies and programs. When constructing health plan comparisons, care should be taken to adjust for covariates to make sure

Table 5. Significant Effects of Managed Care Beliefs, Satisfaction With Pay, and Group Staff in Logistic Regressions of Policies and Procedures on Group/Staff Indicator With and Without Managed Care Beliefs and Satisfaction With Pay*

Policy or Procedure	Generalists [†]					Specialists [†]				
	W/O	With Beliefs				W/O	With Beliefs			
	Grp	Grp	Proc	Prac	Pay	Grp	Grp	Proc	Prac	Pay
Guidelines	.92	.60	.46		.22	.41				.29
Disease management	.85	.46		.29	.31	.51	.29		.21	.23
Reminders	.35		.42		.40	.33				.39
Authorization requests	.48				.35	.40			.28	.28
Authorization frequency	.31			.23	.34	-.02	-.32		.22	.18
Utilization reports	.48	.27			.24	.39		.62		.31
Quality reports	.87	.59		.26	.22	1.07	.72	1.05		.37
Continuing medical education	1.04	.67		.20	.34	1.12	.67			.74
Seek views	.68			.65	.46	.98	.47		.44	.45

*Only values significant at the .05 level are reported. Grp indicates group/staff indicator; Pay, satisfaction with pay; Proc, beliefs about effect of managed care on care processes; Prac, beliefs about effect of managed care on care practice.

[†]W/O indicates that the model was estimated with control variables and the group/staff indicator, but without managed care beliefs and satisfaction with pay. "With beliefs" indicates that the model was estimated with control variables, the group/staff indicator, managed care beliefs, and satisfaction with pay.

that apples are not being compared with oranges. If the goal of comparison is to hold health plans accountable for nonselection effects (eg, the effects associated with building patient volume with physicians and implementing care management policies and programs), then measures should be adjusted for managed care beliefs and satisfaction with pay. An alternative would be to compare recommendations only within health plan type (within group/staff model or within IPA/PPO model health plans).

The results show that physician demographics and practice organization are not strongly related to physician recommendations of health plans. Demographic and practice organization characteristics were generally insignificant in our analyses. This suggests that structural measures of health plans (eg, board certification, tenure of physicians) are unlikely to be related to physician recommendations of a health plan.

CONCLUSION

In summary, physician recommendations of health plans are potentially important because they can play a role in health plan comparison, and these

comparisons could influence purchaser or consumer choice of plans, or regulatory attention devoted to health plans. Our results show that these physician health plan recommendations can be interpreted as reflecting, at least in part, physician experiences with the policies and procedures of the referent plan. Physician recommendations of a health plan are more positive when the health plan has less restrictive authorization processes and formularies, as well as when health plans provide disease management programs and encourage the use of reminders. That is, physicians' health plan recommendations tend to be supportive when processes that improve care (eg, reminders) are being pursued, but also when cost-containment strategies are not being pursued.

Although recommendations are related to health plan policies and procedures, the analyses also show a strong effect of generalized managed care beliefs. Because of this, physician recommendations of health plans should be used as only 1 component of the overall, broader evaluation of health plans by purchasers.

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