Effect of Managed Care and Financing on Practice Constraints and Career Satisfaction in Primary Care

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Background: **The shift away from third party insurers to risk-sharing arrangements affecting care management and clinicians could be the most fundamental change in the health care system. Analysis was undertaken to study how managed care, practice setting, and financial arrangements affect physicians' perceived impact on their practice.**

Methods: **Data were taken from the Community Tracking Study (CTS) physician survey, a national survey of active physicians in the United States fielded between August 1996 and August 1997. Survey instruments were completed by 7,146 primary care physicians in internal medicine (2,355), family practice (3,168), and pediatrics (1,623). The dependent variables are career satisfaction and perceived limitations and pressures on time spent with patients, clinical freedom, income, and continuity. To study the unique effect of financing and gatekeeping arrangements and practice setting, the dependent variables were regressed on gatekeeping, practice revenue, individual physician compensation, practice setting, specialty, age-group, sex, international medical graduate, board certification, and recent change in practice ownership.**

Results: **Total managed care revenue, or individual physician incentives, have no effect on career satisfaction and relatively limited effects on time pressure, income pressure, or patient continuity. In contrast, primary care gatekeeping has a highly significant adverse effect on the same outcome measures. After controlling for financial factors, demographic characteristics, and training differences, physicians in solo and 2-physician practices are significantly more likely to be dissatisfied with their medical career, more likely to report no clinical freedom, and more likely to feel income pressure than physicians in group practices, staff model HMOs, medical schools, or other settings.**

Conclusion: **Physicians in solo and 2-physician practices were least satisfied with their careers and reported more constraints on their clinical freedom and income than physicians in other settings. Physicians in group practices or staff model HMOs are more likely to report time pressure than physicians in solo or 2-physician practices. Family practice falls between internal medicine (less satisfied, more practice constraints) and pediatrics (more satisfied, fewer practice constraints). (J Am Board Fam Pract 2002;15:367–77.)**

Managed care, including health maintenance organizations, point-of-service plans, and preferred provider organizations, covers the health care for most persons with private insurance, whereas traditional indemnity insurance has largely disappeared outside Medicare.[1,2] The growth of managed care in medicine has blurred the distinction between organizations bearing financial risk for health care (insurers), organizations managing care (health maintenance and utilization management organizations), and organizations making clinical treatment decisions (provider groups or individual clinicians). The shift away from a third party insurer to risk-sharing arrangements affecting care management and clinicians could be the most fundamental change in the health care system, and it is undoubtedly the one about which physicians are most concerned.[3–6] Managed care is not synonymous with financial risk sharing (or prepaid care), however, and financing might be only one of several features that affect physician career satisfaction. This article uses data from the 1996–1997 Community Tracking Study (CTS) physician survey[7] to study how practice setting, financing arrangement affecting practice revenue, and individual physician compensation are related to physicians' perceived impact on their practice of medicine and career satisfaction.

The standard source for information about the physician market has been the Socioeconomic

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Monitoring System, a regular telephone survey by the American Medical Association (AMA) of active care physicians.[8] Data from the Socioeconomic Monitoring System shows that the percentage of primary care physicians with capitated contracts and at financial risk is about twice as high as the percentage for medical specialists, although there is substantial variation.[8–10] These results capture one piece of the picture, but they cannot relate them to professional satisfaction and related outcomes. In addition, capitation or managed care revenues generally describe practice level contracts and translate into full-risk contracts only for owners of solo practices, which are less common among primary care physicians.

In larger groups or organizations, the more relevant setting for primary care, physician compensation might be independent of the organization's financial performance, as in the case of unadjusted salaries or payments based on individual performance alone, or it might be tied to the financial performance of the organization through bonuses or profit sharing.[11] A study of primary care physician incentives in medical group practices reported substantial variation in the types of individual compensation implemented by medical groups,[12] including fixed salaries only, individual physician productivity only, and combinations of those two plus adjustments based on other measures (quality of care, group financial performance, patient satisfaction surveys).

Findings from numerous other surveys have shown that physicians believe managed care is having a profound impact on satisfaction and their professional obligations.[13–21] Although the outcomes (physician satisfaction) are often measured in detail, dimensions of managed care are less often distinguished. For example, the 1998 study by Feldman et al[16] asked physicians about their perception of managed care, defined as "any health care system which integrates the financing and delivery of medical services, whose aim is to control costs and improve quality, and uses methods which control choices traditionally made exclusively within the patient-physician relationship, eg, HMOs [health maintenance organizations], PPOs [preferred provider organizations], IPAs [independent practice associations]."

Because managed care is here to stay, documenting dissatisfaction with an amorphous concept of managed care does not provide guidance for health care policy. Instead, we need a better understanding of how specific managed care arrangements affect physician practice so we can determine particularly problematic or less problematic features. More recent studies have started to open this black-box measure of managed care. Chehab et al[15] found that within managed care settings in California, physicians in traditional staff group model HMOs have significantly higher professional satisfaction than physicians in office-based independent practice. Linzer et al[21] also contrast different practice settings in a national survey (the Physician Worklife Study) and report that HMO physicians were more satisfied regarding autonomy and administrative issues, but less satisfied with resources and their overall career than were physicians in other settings. The linkages to specific features of managed care remain unclear, however, and the goal of this study is to estimate the unique effects of specific financing and managed care arrangements on career satisfaction and perceived practice limitations.

Methods

Source of Data

The data come from the 1996–1997 Community Tracking Study (CTS) physician survey[7] of active physicians in the United States between August 1996 and August 1997. To be eligible, physicians had to have completed their medical training (which excludes residents, interns, or fellows), be practicing in the contiguous United States, and be providing direct patient care for at least 20 hours per week. Primary care physicians were oversampled relative to specialists, as were specific regional locations. The total number of completed interviews was 12,385, which makes CTS by far the largest recent physician survey.

The response rate of 65.4% is high compared with other recent national physician surveys, even if it falls short of standards espoused by epidemiologists. Response rates of 80% might be unrealistic, however, even with intensive follow-up, respondent payments, and refusal conversion efforts that were used in the CTS surveys. The average response rate for larger physician mail surveys (>1,000 observations) through 1995 was 52%.[22] The latest wave of the AMA Socioeconomic Monitoring System (a telephone survey) had a response rate of 42%[8]; the Physician Worklife Study[21] reported a response rate of 52%, although the raw response rate was 40% (2,326 of 5,704 attempts).

This study is based on a subset to the 7,146 primary care physicians in internal medicine (n = 2,355), family practice (n = 3,168), and pediatrics (n = 1,623). The survey questionnaire was administered completely by computer-assisted telephone interviews. The study has been described in other publications,[7,23] including an important article on physicians' perception of their scope of practice,[23] and more technical information is available in the physician survey public use file.[24] The analysis in this article is based on the public release version available through the Inter-university Consortium for Political and Social Research and can be used to replicate the results reported here. Race-ethnicity or geographic location (including rural-urban identifiers) are not available in the public use file. Although these data have been collected and are available in principle, contractual disagreements about requirements for access have made it thus far impossible to obtain the data at the University of California, Los Angeles. All results are weighted to be nationally representative.

Dependent Variables

Overall career satisfaction is the response to the question: "Thinking very generally about your satisfaction with your overall career in medicine, would you say that you are currently [very satisfied; somewhat satisfied; neither satisfied nor dissatisfied; somewhat dissatisfied; very dissatisfied]." The analysis used a dichotomous variable indicating whether the physician is somewhat or very dissatisfied. The other four variables focused on the physician's perception of pressures compromising the physician-patient relationship. All items had the five following response categories: agree strongly, agree somewhat, neither agree nor disagree, disagree somewhat, disagree strongly. Similar to the career satisfaction variable, the responses were collapsed into dichotomous variables with a 1 indicating that the physician disagrees (somewhat or strongly) with those statements.

Not enough time indicates that the respondent disagreed with the statement, "I have adequate time to spend with my patients during typical office/outpatient visits"; *no clinical freedom* indicates disagreement with the statement, "I have the freedom to make clinical decisions that meet my patients needs"; *income pressure* indicates disagreement with the statement, "I can make clinical decisions in the best interest of my patients without the possibility of reducing my income"; and *no continuity* indicates disagreement with the statement, "It is possible to maintain the kind of continuing relationship with patients over time that promote the delivery of high-quality care." The main reason for collapsing the response categories is a clearer and understandable presentation.

Explanatory Variables

Practice type is categorized in 5 groups: solo or 2 physician practices, group practices, staff and group model HMOs, medical schools, and hospital-based practice. The hospital category in this analysis reflects the employer, and the survey instrument provided the following explanation: "An EMPLOYER is the entity that pays you and should not be confused with where you work. For instance, your employer could be a group practice even if you work in a hospital."

Practice revenue is measured by two variables. One is the average percentage of patient care practice revenue paid on a capitated or other prepaid basis; the other is the percentage from all managed care.

Primary care gatekeeping is one of the most common managed care techniques. It is measured in the CTS survey as the percentage (0%–100%) of the respondent's patients for whom the physician is the gatekeeper to specialty services. It is based on the question: "Some insurance plans or medical groups REQUIRE their enrollees to obtain permission from a primary care physician before seeing a specialist. For roughly what percent of your patients do you serve in this role?"

Individual physician incentives are measured by four indicator (0–1) variables. The four items are whether physicians' individual compensation is affected by (1) their own productivity, (2) satisfaction surveys completed by their own patients, (3) specific measures of quality of care, and (4) practice profiling. These variables are not meaningful for full owners of solo practices, who are excluded from analyses using these variables. A greater number of individuals have data missing for these variables (1.7%) than for some other variables (eg, 0.2% missing for career satisfaction).

In addition, the analysis considers demographic and other explanatory variables, such as physician sex (1 = female), age-group (born before 1941, born after 1955; middle group is reference category), source of medical degree (1 = international

medical graduate), specialty (indicators for family practice and pediatrics; internal medicine is the reference category), and whether the physician was part of a practice that was purchased by another organization in the past 2 years. There has been a high rate of changes in ownership, especially among hospitals and HMOs, and the resulting uncertainties are likely to have adversely affected satisfaction, even if they are not directly related to practice type or managed care.

Data Analysis

To account for sampling design and to adjust for differences caused by nonresponse, a sampling weight, calculated as the inverse of the probability of selection and response, is used to make inferences representative for US primary care physicians engaged in full-time patient care (>20 h/wk). This weight is used in the descriptive results and to weight regression models. Logistic models regress each of the dichotomous dependent variables (dissatisfied with medical career, not enough time, no clinical freedom, income pressure, no continuity) on the explanatory variables. The explanatory variables in the regression models are percentage of capitated revenue, percentage of managed care revenue, percentage gatekeeping, indicators for five practice settings (solo and 2-person practice as the reference group), female, young and old (middle age group as the reference group), international medical graduate, board certification, practice ownership change in past 2 years, and indicators for family medicine and pediatrics (internal medicine as the reference group).

The results for the individual compensation variables are based on the same models with the addition of the four individual compensation variables, but estimated on the smaller sample for which individual compensation is defined (excluding owners). Most of the explanatory variables are dichotomous, and odds ratios are presented; but three of the main variables of interest (the two practice revenue measures and the percentage of gatekeeping) are continuous, and odds ratios would be hard to interpret. There are many alternative ways to display results for continuous variables, and I chose a graphical representation, which displays the percentage change in the probability of a 1 in the dependent variable when moving the average physician from the 25th percentile to the 75th percentile. The alternative, displaying regression coefficients (or odds ratios) for all variables, is a uniform presentation, but is not very intuitive. For odds ratios, I also report the 95% confidence interval in parentheses (unadjusted for geographic clustering).

The public release file analyzed here does not contain geographic identifiers that could be used to study the effect of local variations or adjust for geographic clustering. To highlight particularly strong effects, results that are significant at 1/10 of 1% ($P < .001$) are printed in bold in the tables based on regression models. The latter is a heuristic adjustment to take into account the clustering design effect. The average design effect for all physicians was estimated to be around 2.2, although it would be lower for subgroups.[24] A design effect of 2.2 increases standard errors by about 50% (square root of 2.2) or reduces the (unadjusted) z value corresponding to $P = .0016$ to an adjusted z value of 1.96 ($P = .05$).

Results

Descriptive Statistics: Demographics, Financial Arrangements, and Perceived Impacts on Practice

Table 1 provides descriptive statistics on demographic characteristics, practice ownership, and revenue, by practice setting. There clearly are large differences across practice settings, and some of the largest differences are between primary care physicians in solo or 2-person practices and physicians in group practices or staff model HMOs. Solo practitioners are significantly more likely to be male, older, international medical graduates, and not board certified than are physicians in every other setting (all pairwise comparisons are significant at $P < .01$). Many of those variables are known to be independently associated with physician satisfaction, such as age and sex.[25,26] In addition, financial arrangements differ across practice settings (Table 2). Descriptive statistics, therefore, do not provide information to which extent differences in satisfaction across practice settings are due to differences in physician demographics, financing, or specific to the organization of this type of practice setting.

Although there are a number of significant differences among the other groups, these groups also have much in common. For example, there is no difference in board certification among physicians in group practice, staff model HMOs, medical schools, or hospitals or in the percentage of older physicians. The percentage of foreign medical graduates is similar in group practices and medical

Table 1. Descriptive Statistics for Explanatory Variables, mean percent (95% CI).

Characteristic	All Physicians	Solo, 2-Person Practice	Group Practice	Group or Staff Model HMO	Medical School	Hospital Based
Female	23.7 (22.7, 24.7)	18.0 (16.5, 19.5)	21.8 (19.9, 23.7)	32.8 (29.1, 36.4)	39.8 (34.7, 45.0)	26.6 (23.8, 29.3)
Young (born after 1955)	31.1 (30.0, 32.2)	20.0 (18.4, 21.5)	35.6 (33.4, 37.8)	37.4 (33.6, 41.1)	45.2 (39.0, 50.4)	42.8 (39.7, 45.9)
Old (born before 1941)	21.7 (20.8, 22.7)	31.8 (30.0, 33.6)	16.2 (14.5, 17.9)	12.7 (10.1, 15.4)	13.4 (9.8, 17.0)	13.2 (11.1, 15.3)
International medical graduate	21.1 (20.2, 22.0)	29.5 (27.8, 31.2)	12.5 (10.9, 14.0)	21.7 (18.4, 24.9)	13.2 (9.6, 16.8)	18.8 (16.4, 21.2)
Board certified in specialty	78.0 (77.0, 79.0)	66.5 (64.7, 68.3)	88.3 (86.8, 89.8)	87.2 (84.5, 89.8)	86.9 (83.3, 90.4)	85.2 (83.1, 87.5)
Was in a practice purchased by other organization in past 2 years	15.2 (14.4, 16.0)	3.1 (2.4, 3.7)	14.4 (12.8, 16.0)	23.0 (19.7, 26.3)	13.7 (10.0, 17.3)	35.3 (32.4, 38.3)
Patients subject to gate keeping	39.1 (38.4, 39.8)	32.5 (31.4, 33.6)	40.2 (38.9, 41.5)	70.9 (68.2, 73.3)	44.5 (41.1, 48.0)	36.9 (35.2, 38.7)
Total practice revenue from managed care	44.2 (43.6, 44.9)	37.2 (36.2, 38.3)	45.7 (44.5, 46.8)	81.3 (79.6, 84.4)	48.0 (45.0, 51.0)	41.7 (40.1, 43.4)
Capitated practice revenue	23.3 (22.7, 24.0)	16.1 (15.3, 17.0)	21.8 (20.7, 22.8)	65.8 (63.1, 68.5)	28.2 (25.3, 31.1)	20.2 (18.8, 21.5)
Total	7,146	2,573	1,814	623	349	990

HMO—health maintenance organization.

schools and (at a higher level) in HMOs and hospitals. Even variables that differ significantly among all groups (such as percentage of younger physicians), the group practice, HMO, medical school, and hospital groups are usually more similar to each other than to solo practices. The sources of practice revenue differ by setting, with HMOs and solo and 2-person practices at the opposite extremes of the spectrum, but rates are relatively similar among the other four groups.

Table 2 displays the descriptive statistics for individual physician incentives. Note that Table 2 excludes full owners of solo practices, which is why the sample size in the first column is much smaller than in Table 1. There are several noticeable differences, particularly between group or staff model HMOs and other practice types. The percentage of physicians whose compensation is adjusted according to patient satisfaction surveys, some measure of quality, or practice profiling is dramatically higher in HMOs than in any other setting, often by a factor of 2 or 3. In contrast, physicians own productivity (which most commonly means the number of billable services) is much less important in

Table 2. Descriptive Statistics: Individual Physician Financial Incentives, mean percent (95% CI).

Financial Incentive	All Physicians	Solo or 2-Person Practice	Group Practice	Group or Staff Model HMO	Medical School	Hospital Based
Patient satisfaction surveys	29.9 (28.6, 31.1)	17.8 (14.8, 20.8)	20.3 (18.4, 22.2)	65.9 (62.1, 69.7)	27.1 (22.4, 31.8)	32.8 (29.9, 35.8)
Physician own productivity	74.0 (72.9, 75.2)	69.3 (65.8, 72.9)	80.6 (78.8, 82.4)	64.3 (60.4, 68.8)	66.3 (61.3, 71.2)	78.8 (76.2, 81.3)
Practice profiling	20.8 (20.0, 21.9)	18.0 (15.0, 21.0)	15.9 (14.2, 17.5)	41.2 (37.3, 45.2)	17.7 (13.7, 21.8)	21.1 (18.5, 23.7)
Measures of quality	25.8 (24.6, 27.0)	20.9 (17.7, 24.1)	18.3 (16.5, 20.0)	54.0 (50.0, 57.9)	21.6 (17.2, 26.0)	26.1 (23.4, 28.9)
Number	5,173	639	1,803	612	349	984

Note: Full owners of practices are excluded from the questions of individual incentives.

Table 3. Descriptive Statistics for Career Satisfaction and Perceived Practice Limitations, mean percent (95% CI).

Career Satisfaction and Practice Limitation	All Physicians	Solo, 2-Person Practice	Group Practice	Group or Staff Model HMO	Medical School	Hospital Based
Dissatisfied with career in medicine	17.4 (16.5, 18.3)	23.5 (21.9, 25.2)	13.5 (11.9, 15.1)	18.4 (15.4, 21.5)	10.9 (7.6, 14.2)	12.7 (10.6, 14.7)
Time pressure	30.8 (29.7, 31.9)	24.7 (23.1, 26.4)	35.6 (33.3, 37.9)	45.0 (41.1, 48.9)	33.5 (28.6, 38.5)	29.4 (26.5, 32.2)
Lack of clinical freedom	13.0 (12.2, 13.8)	16.7 (15.2, 18.2)	12.5 (11.0, 14.1)	5.3 (3.5, 7.1)	13.3 (9.7, 16.8)	10.2 (8.3, 12.1)
Income pressure	18.7 (17.8, 19.6)	22.1 (20.5, 23.8)	22.2 (20.3, 24.2)	11.1 (8.7, 13.7)	12.9 (9.3, 16.4)	13.4 (11.3, 15.6)
Lack of continuity of care	20.4 (19.4, 21.3)	21.1 (19.5, 22.6)	21.1 (19.3, 23.0)	20.0 (16.8, 23.2)	22.9 (18.4, 27.3)	17.1 (14.7, 19.5)
Number	7,146	2,573	1,814	623	349	990

HMO—health maintenance organization.

HMOs (or medical schools) than among physicians in group practices or employed by hospitals.

Table 3 provides descriptive statistics for the dependent variables. Again, there are very large differences by practice types. Physicians in small practices are more likely to be dissatisfied with their medical career, less likely to feel time pressure, and more likely to report limitations on their freedom to make clinical decisions in their patients' interest than any other group. In contrast, physicians in HMOs, who have the second highest rate of career dissatisfaction, are most likely to report time pressure and least likely to report limitations on their clinical freedom.

In addition, there are also highly significant differences between internists (least satisfied with career, more likely to report practice constraints), family physicians (in the middle), and pediatricians (most satisfied with career, least likely to report practice constraints). It is unclear how to interpret the descriptive statistics (not shown) because of sociodemographic differences among internists, family physicians, and pediatricians, eg, a much higher rate of women among pediatricians or a higher proportion of older family physicians. Adjusted results are therefore discussed below and shown in Figure 1.

Role of Gatekeeping and Practice Revenue

Gatekeeping is always a highly significant predictor of dissatisfaction and perceived practice limitations, but source of practice revenue (testing the effects of capitated and total managed care revenue jointly) is

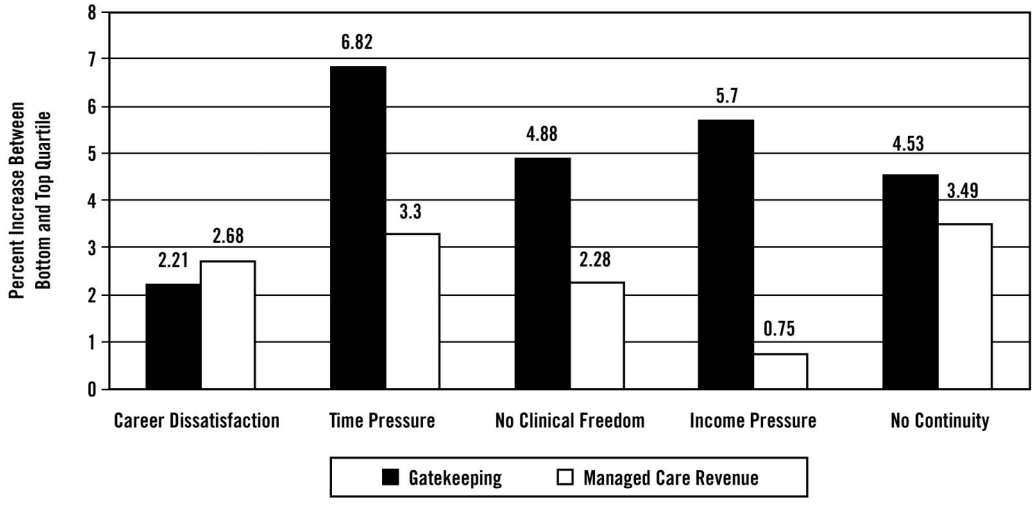

Figure 1. Effect of specialty on career satisfaction and patient-provider relationship.

Table 4. Practice Setting and Its Unique Effect on Career Satisfaction and Perceived Practice Limitations (odds ratio relative to solo and 2-physician practice).

Practice Setting	Career Dissatisfaction % (95% CI)	Time Pressure % (95% CI)	No Clinical Freedom % (95% CI)	Income Pressure % (95% CI)	No Continuity % (95% CI)
Group practice	**.58* (.47, .71)**	1.33 (1.13, 1.58)	**.67* (.54, .82)**	.85 (.71, 1.02)	.84 (.70, 1.00)
Health maintenance organization	.64 (.47, .88)	1.42 (1.11, 1.81)	**.16* (.10, .25)**	**.26* (.18, .36)**	**.56* (.42, .76)**
Medical school	**.45* (.30, .69)**	1.10 (.83, 1.46)	.65 (.43, .98)	**.40* (.28, .57)**	.91 (.65, 1.26)
Hospital	**.52* (.40, .68)**	.99 (.80, 1.22)	**.52* (.39, .69)**	**.45* (.35, .57)**	**.64* (.51, .81)**
Other	**.52* (.40, .68)**	1.15 (.93, 1.44)	**.50* (.36, .69)**	**.45* (.34, .60)**	.80 (.63, 1.03)

Note: Based on logistic regression model adjusting for gatekeeping, practice revenue, specialty, age-group, sex, international medical graduate, board certification, and recent change in practice ownership.
*P = .001.

not significantly associated with career satisfaction or time pressure and only at the 5% level for income pressure (results not shown). Statistical significance is only part of the picture, and magnitudes are important. Figure 2 displays the measures of effect sizes by the percentage point increase in career dissatisfaction, time pressure, lack of clinical freedom, income pressure, and lack of continuity for the average physician when shifting from the 25th percentile to the 75th percentile on gatekeeping and managed care revenue. For gatekeeping, this shift corresponds to a switch from 10% of patients to 60% of patients. For revenue, this shift corresponds to a switch from 0% to 40% for capitated revenue and from 20% to 70% for total managed care revenue.

The practice revenue variables are changed simultaneously because they are not independent (capitated revenue is always part of total managed care revenue). The simulated effects on career dissatisfaction of gatekeeping (statistically significant) and managed care revenue (not statistically significant) are similar and relatively small. There is a large difference, however, between gatekeeping and managed care revenue effects for the other dependent variables. Compared with increases in managed care practice revenue, increases in primary care gatekeeping are always associated with

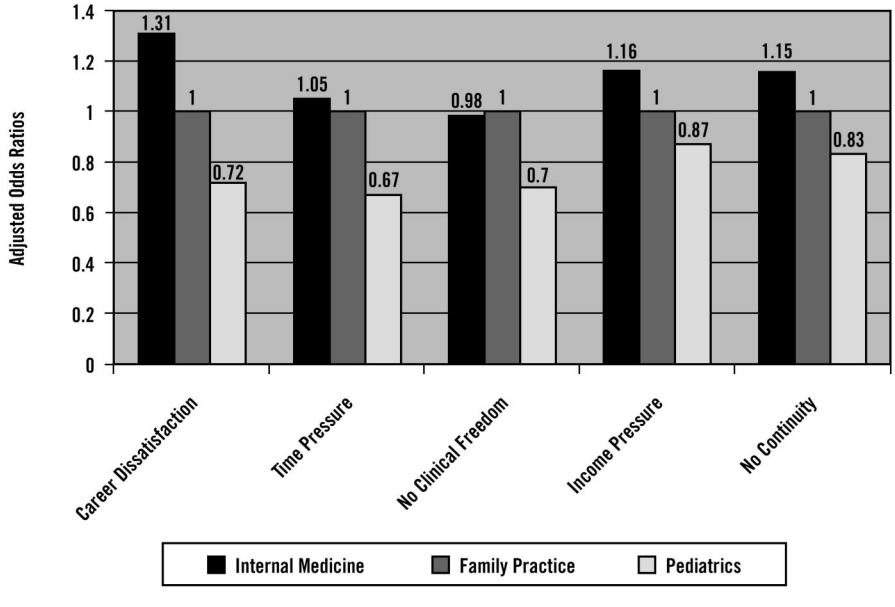

Figure 2. Effect of gatekeeping and source of practice revenue on career satisfaction and patient-provider relationship.

Table 5. Effect of Other Physician Characteristics on Career Satisfaction and Perceived Practice Limitations.

Physician Characteristics	Career Dissatisfaction % (95% CI)	Time Pressure % (95% CI)	No Clinical Freedom % (95% CI)	Income Pressure % (95% CI)	No Continuity % (95% CI)
Female (vs male)	.92 (.77, 1.10)	1.25 (1.09, 1.44)	1.21 (1.00, 1.47)	1.25 (1.06, 1.47)	.88 (.75, 1.04)
Young (born after 1955 vs born between 1941 and 1944)	**.62* (.51, .75)**	1.09 (.95, 1.25)	.83 (.69, 1.00)	.88 (.75, 1.03)	.89 (.76, 1.04)
Old (born before 1941 vs born between 1941 and 1944)	1.26 (1.05, 1.51)	**.62* (.51, .73)**	.79 (.64, .97)	**.71* (.58, .87)**	**.71* (.59, .85)**
International medical graduate (vs US graduate)	1.21 (1.01, 1.44)	.79 (.68, .92)	1.10 (.90, 1.33)	.93 (.78, 1.11)	.82 (.69, .99)
Board certified in specialty (vs no board-certified)	.76 (.63, .91)	**1.47* (1.22, 1.74)**	.84 (.69, 1.04)	1.11 (.92, 1.36)	1.16 (.96, 1.40)
Practice recently acquired by other organization (vs no change in ownership)	1.25 (1.01, 1.55)	.98 (.82, 1.17)	1.14 (.90, 1.44)	1.24 (1.02, 1.50)	1.19 (.98, 1.44)

Note: Based on logistic regression model adjusting for gatekeeping, practice revenue, practice setting.
*$P = .001$.

much larger increases in perceived limitations and dissatisfaction. For time pressure and lack of clinical freedom, the gatekeeping effect is more than twice as large; for income pressure, the gatekeeping effect is several times larger.

Practice Setting

Table 4 displays the difference across practice settings after controlling for the role of gatekeeping, practice revenue, and other variables. Compared with physicians in solo and 2-physician practices, physicians in any other setting are significantly less likely to be dissatisfied with their medical career and less likely to feel constrained in their clinical freedom to make decisions in the interest of their patients. Except for physicians in group practices, all other physicians are also significantly less likely than physicians in solo and 2-physician practices to feel pressure on their incomes when making decisions in their patients' interest. Physicians in group practices and HMOs, but not in other settings, feel more time pressure than physicians in solo and 2-person practices.

Physician Specialty

Figure 2 shows the adjusted odds ratios of dissatisfaction with career or reports of practice constraints or limitations. Physicians in family practice and pediatrics are much less likely to be dissatisfied with their career than internists. For almost all measures, internists are more likely than comparable family physicians to report these constraints and pediatricians are less likely to report these constraints. The differences between internal medicine and family practice are highly significant for career satisfaction (at the $P < .001$ level, which would remain statistical significant at $P < .05$ even if the full clustering effect applied). The differences between pediatrics and family practice are highly significant for career satisfaction, time pressure, and constraints on clinical freedom.

Other Physician Characteristics

There is no significant difference in career satisfaction between male and female physicians after controlling for other characteristics, but women are significantly more likely to report time and income pressure (Table 5). The Physician Worklife Study also reported greater time pressure in ambulatory settings for women,[26] and this analysis shows that this result holds even after controlling for financing and practice setting differences.

Compared with physicians in the middle age-group, young physicians (born after 1955) are significantly less likely to be dissatisfied with their career and older physicians (born before 1941) are significantly more likely to be dissatisfied with their medical career. This finding is consistent with findings from other recent physician surveys,[17,19] but it differs from the Women Physicians' Health Study, which reported a positive (rather than negative) association between age and satisfaction.[27,28] I therefore tested whether the age effect differs between men and women, but such was not the case.

Table 6. Individual Physician Compensation and Its Effects on Career Satisfaction and Perceived Practice Limitations.

Physician Compensation	Career Dissatisfaction % (95% CI)	Time Pressure % (95% CI)	No Clinical Freedom % (95% CI)	Income Pressure % (95% CI)	No Continuity % (95% CI)
Own productivity	1.03 (.83, 1.29)	1.07 (.90, 1.26)	.93 (.74, 1.18)	1.26* (1.02, 1.55)	.83† (.68, 1.01)
Patient satisfaction survey	.91 (.72, 1.15)	0.86 (.71, 1.06)	.93 (.68, 1.27)	.73* (.57, .94)	1.22† (.97, 1.53)
Profiling	1.24 (.94, 1.63)	1.31* (1.06, 1.62)	1.31† (.96, 1.79)	1.34* (1.02, 1.75)	1.15 (.89, 1.48)
Quality	.83 (.63, 1.09)	.93 (.75, 1.15)	.87 (.61, 1.24)	1.00 (.74, 1.36)	.75* (.58, .97)

Note: Subset to smaller sample (see Table 2), excluding full owners. Based on logistic regression model adjusting for gatekeeping, practice revenue, practice setting, specialty, age-group, sex, international medical graduate, board certification, and recent change in practice ownership.
*Significant at $P < .05$.
†Significant at $P < .10$.

For women, the rate of dissatisfaction is 10% in the youngest group, 17% in the middle group, and 21% in the old group, which is the same age gradient as for men. I also conducted sensitivity analyses using other age groupings, other subgroupings, year of starting medical practice, or year of graduating from medical school instead of age. The relation between increasing age and higher dissatisfaction rates, however, was entirely robust to all changes in specification and also holds among psychiatrists and other specialists.[25] The survey analyzed by Frank et al[27,28] was fielded between 1 and 3 years before the CTS physician survey or the surveys analyzed by Warren et al[19] and Hueston,[17] but this short period appears unlikely to be the cause of the reversal of the age effect.

International medical graduates are significantly more likely to be dissatisfied with their medical career, less likely to feel time pressure, and less likely to be concerned about continuity of care. In contrast, board-certified physicians are less likely to be dissatisfied with their career and more likely to feel time pressure. Recent changes in practice ownership are associated with significantly higher career dissatisfaction and income pressure rates.

Individual Physician Compensation

Another possibility of how financial incentives could affect individual physicians is through bonuses or performance payments. Such arrangements would primarily apply to physicians in larger institutions or physicians who are not practice owners. The last set of comparisons (Table 6) therefore focuses on an individual physician compensation subset to the slightly smaller group of physicians for whom these variables are defined. Overall, bonuses and salary adjustments or earnings dependent on own productivity, satisfaction surveys, quality measures, or practice profiling do not appear to have a large effect. Compared with gatekeeping, which remains significant at $P = .05$ for satisfaction and at $P = .001$ for the other four dependent variables, none of the individual physician compensation variables are significant at $P = .01$ and only 4 of 20 comparisons are significant at $P = .05$. With 20 comparisons, one significant result is expected by pure chance even if there are no underlying differences. The only dependent variable for which physician compensation seems to have an effect is income pressure (physician concern that appropriate clinical decisions reduce personal earnings), which is higher under practice profiling and compensation based on physician productivity and lower if compensation is based on patient satisfaction surveys.

Discussion

The effect of financing and managed care mechanisms on the practice remains a critically important area of research. Remarkably few data sets allow comparisons of physician practices despite the immediate relevance to policy decisions about managed care regulation. This article reports an analysis of how some specific financing arrangements and managed care techniques are related to career satisfaction and perceived limitations or constraints on practice. Surprisingly, capitated revenue, total managed care revenue, or individual physician incentives have no effect on career satisfaction and relatively limited effects on time pressure, income

pressure, or patient continuity, which stands in sharp contrast with primary care gatekeeping. Increasing the percentage of patients for whom the physician has to act as gatekeeper to specialty care is associated with significant increases in career dissatisfaction and perceived time pressure, lack of clinical freedom, income pressure, and lack of continuity of care. The most recent trend away from gatekeeping arrangements in many managed care plans should have a positive effect on career satisfaction, despite a continuing increase in total managed care revenue for most practices.

Practice setting remains an important predictor of satisfaction outcomes, even after controlling for financial factors and demographic and training differences. Physicians in solo and 2-physician practices are significantly more likely to be dissatisfied with their medical career, more likely to report lack of clinical freedom, and more likely to feel income pressure than physicians in group practices, staff model HMOs, medical schools, or other settings. Physicians in group practices or staff model HMOs are more likely to report time pressure than physicians in solo and 2-physician practices.

Some of these effects might be related to managed care instruments that have not been assessed in this survey (or that might be difficult to measure). For example, integrated delivery systems offer much better opportunities to affect practice patterns through positive interventions, such as training or physician participation in developing guidelines. In contrast, physicians in small practices might experience the effect of managed care primarily through increased hassle factors. Such differences could be behind the dramatic difference in how physicians perceive their clinical freedom. Physicians in solo and 2-person practices (traditionally considered the setting for maximum physician autonomy) are three times more likely than physicians in HMOs (traditionally considered the setting for constrained autonomy) to complain about restrictions in their ability to make clinical decisions in their patients' interest. This difference does not disappear when adjusting for observable measures of selection bias (such as age differences), although some unmeasurable residual selection bias caused by physician tastes for practice environments that are unrelated to sociodemographics or training might remain.

While this study provides some new insights, many questions remain and cannot be answered yet. The survey has many limitations, chief among them the absence of information on such managed care techniques as guidelines, formularies, preauthorization, and concurrent utilization review, although the latter are more likely to affect specialists than primary care physicians. Primary care gatekeeping was assessed, but not other techniques. Differences in these dimensions could explain the lower satisfaction rates and higher concerns about income pressure or clinical autonomy in small practices. Even the financial arrangement variables are somewhat limited. Nevertheless, economic incentives have been of particular concerns to physicians, and this analysis provides at least a start toward a more detailed analysis of how exactly managed care affects the work life of physicians.

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