

# Managed Care, Professional Autonomy, and Income

## Effects on Physician Career Satisfaction

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**CONTEXT:** Career satisfaction among physicians is a topic of importance to physicians in practice, physicians in training, health system administrators, physician organization executives, and consumers. The level of career satisfaction derived by physicians from their work is a basic yet essential element in the functioning of the health care system.

**OBJECTIVE:** To examine the degree to which professional autonomy, compensation, and managed care are determinants of career satisfaction among physicians.

**DESIGN:** Cross-sectional analysis using data from 1996–97 Community Tracking Study physician telephone survey.

**SETTING AND PARTICIPANTS:** A nationally representative sample of 12,385 direct patient care physicians. The survey response rate was 65%.

**MAIN OUTCOME MEASURE:** Overall career satisfaction among U.S. physicians.

**RESULTS:** Bivariate results show that physicians with low managed care revenues are significantly more likely to be “very satisfied” than are physicians with high managed care revenue ( $P < .05$ ), and that physicians with low managed care revenues are significantly more likely to report higher levels of clinical freedom than are physicians with high managed care revenue ( $P < .05$ ). Multivariate analyses demonstrate that, among our measures, traditional core professional values and autonomy are the most important determinants of career satisfaction after controlling for all other factors. Relative income is also an important independent predictor. Multiple dimensions of professional autonomy hold up as strong, independent predictors of career satisfaction, while the effect of managed care does not. Managed care appears to exert its effect on satisfaction through its impact on professional autonomy, not through income reduction.

**CONCLUSIONS:** Our results suggest that when managed care (or other influences) erode professional autonomy, the result is a highly negative impact on physician career satisfaction.

**KEY WORDS:** physician career satisfaction; professional autonomy; managed care; income.

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Physician career satisfaction has been demonstrated to be positively and significantly associated with quality of care as measured by prescribing patterns,<sup>1</sup> patient compliance,<sup>2</sup> and patient satisfaction.<sup>3,4</sup> Physician retention has been used as a “report card” indicator among HMO rankings,<sup>5</sup> and, more recently, physician turnover has been

shown to have major financial implications. The estimated institutional-level cost to employers to recruit and replace a primary care physician ranges from \$240,000 to \$265,000.<sup>6</sup>

Widespread perceptions of global physician career satisfaction are theorized to influence attractiveness of the medical profession, thus possibly shaping the quantity and quality of the medical school entrant pool. Interspecialty differences in career satisfaction may also influence specialty selection and ultimately specialty distribution. Thus, physician career satisfaction may have far-reaching implications for cost and quality in addition to shaping the physician workforce.

A widely held perception of managed care is that its growth has severely eroded the level of satisfaction physicians derive from the practice of medicine, and indeed that it has demoralized the profession. Several facets of physician satisfaction have been examined in prior studies, including: global career satisfaction, satisfaction with one’s specialty, and job-specific or practice-specific satisfaction. In the context of the impact of managed care, the broad construct of global career satisfaction is of greatest policy significance. Such a measure is also important insofar as overall career satisfaction among physicians is a barometer of the medical profession’s state or condition. For these reasons as well as data availability, the focus of this study is on overall career satisfaction.

The existing literature regarding managed care’s influence on career satisfaction among physicians is mixed.<sup>7–12</sup> Prior studies have examined impacts of managed care on satisfaction using various measures, including HMO arrangements,<sup>7,9,13</sup> individual-level managed care participation,<sup>11,14</sup> and market-level managed care penetration.<sup>9,15,16</sup> The negative impact of managed care on physicians’ satisfaction that has been found in some studies may be due to reduced income or may be attributable to reduced levels of clinical autonomy, or both.<sup>15</sup> Studies have variously focused on income effects,<sup>11,17,18</sup> reduced autonomy,<sup>11,17,19,20</sup> and financial incentives.<sup>9,10</sup> Other research has demonstrated the importance of selected aspects of core professional values and autonomy as determinants of satisfaction.<sup>11,13,17,19</sup> Few studies to our knowledge have simultaneously examined the impacts of all of these effects on physician satisfaction, and none have assessed the relative contribution of each.

### DEFINING PROFESSIONAL AUTONOMY

Of major importance in the context of this study is the relationship between physicians’ perceptions of professional values, professional autonomy, and career

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satisfaction. In the broadest sense, professionalism is defined along three key dimensions: expert knowledge, self-regulation, and an obligation to subordinate self-interest to the needs and interests of the client.<sup>21,22</sup> Within the specific context of the medical profession, there has been an emphasis on altruism and the responsibility of physicians to embrace values that place patients' medical needs over physicians' self-interest. High moral and ethical standards, recognition of and commitment to societal needs, and humanistic values such as integrity, trustworthiness, respect, and empathy are also recognized as key elements of medical professionalism.<sup>22-27</sup>

The principle of autonomy is related to professionalism at several levels. Autonomy at the collective level relates to the ability of a profession to control the standards of entry as well as set the terms of work. On another level, individual autonomy can encompass altruistic motivations as well as self-interest. Through a commitment to professional values and in exchange for honoring the needs of the patient in a sacred trust, physicians earn unique societal stature. This in turn conveys a high degree of individual autonomy to control the terms and content of their work. Professional autonomy on an individual level encompasses not only those aspects of work derived from one's medical expertise, such as clinical decision making and the ability to obtain needed medical services for patients (clinical or technical autonomy), but also other prerogatives pertaining to control over work (such as the autonomy to structure one's schedule). Autonomy in this latter aspect of practice, although not directly related to patient care, remains a highly valued privilege among physicians.

This study builds upon a conceptual model developed by the SGIM Career Satisfaction Study Group. Within its underlying framework, this analysis incorporates adapted measures of most of the determinants of career satisfaction outlined in the SGIM conceptual model.<sup>13,28,29</sup> We conceptualize professional autonomy as an intervening set of variables influenced by managed care on one hand, but also influencing satisfaction on the other. Our conceptual framework explicitly recognizes that managed care influences professional autonomy, as well as income, which in turn then influence career satisfaction. We additionally hypothesize that managed care might directly influence satisfaction or that it might influence satisfaction through unexplained mediating factors.

Our Community Tracking Study data, based upon a large and nationally representative sample, allow us to extend the work of other investigators with richer information on practice and employment arrangements, income, market characteristics, and individual-level participation in managed care. The data set also allows us to examine specialists and primary care physicians separately.

This study sought to address the following research questions:

How and to what degree are professional autonomy, compensation, and managed care associated with physi-

cian career satisfaction? If managed care influences physician career satisfaction, which of the indirect effects of managed care (e.g., those relating to its impact on core professional values and clinical autonomy or those affecting income) have the greatest independent effect on satisfaction? Are there any residual or unspecified effects of managed care?

We hypothesized that professional autonomy is a strong, if not the preeminent, predictor of career satisfaction among physicians, after controlling for the effects of other important determinants such as income and managed care. We tested both for direct effects of managed care on satisfaction and for indirect effects exerted through autonomy and income.

## METHODS

### Data Source

The data for this study are from the 1996-97 Community Tracking Study Physician Survey.<sup>30</sup> The Physician Survey was designed to be representative of direct patient care physicians in the continental United States, as well as in selected communities.<sup>31</sup> The first stage of sample selection was the selection of sixty sites. Sites were defined as metropolitan statistical areas or, for nonmetropolitan areas, as groups of counties using conventional definitions of economic areas. Sites were stratified by region of the country and according to medium and large metropolitan sites (200,000 persons or more), small metropolitan sites (less than 200,000 persons), and nonmetropolitan sites. Sixty sites were then randomly selected with probability in proportion to population. The sixty-site sample was supplemented by a small independently drawn national sample to improve the statistical precision of national estimates.

The sample of physicians was obtained from the master files of the American Medical Association and the American Osteopathic Association. The sample included active, nonfederal, office- and hospital-based physicians who spend at least 20 hours per week in direct patient care in one of the 48 states in the continental United States. Non-patient care physicians, residents and fellows, as well as physicians in certain specialties such as radiology, anesthesiology, and pathology, were excluded from the sample.

For sampling purposes, primary care physicians (defined as those whose primary specialty was family practice, general practice, general internal medicine or pediatrics) were over-sampled (Table 1). A random sample of 23,096 physicians in active practice was obtained, of whom 18,947 were eligible for the survey. Between August 1996 and August 1997 telephone interviews were conducted, with an overall response rate of 65 percent.<sup>32</sup>

Item nonresponse rates for the survey-based independent variables used in this analysis ranged from 0.0 percent (specialty) to 16 percent (income). A standard imputation approach, supplemented with a few logical

Table 1. Sample Description

| Personal and Practice Characteristics   | Primary Care Physicians |               | Specialist Physicians |               |
|---|-------------------------|---------------|-----------------------|---------------|
|   | %, Weighted             | N, Unweighted | %, Weighted           | N, Unweighted |
| Demographic characteristics             |                         |               |                       |               |
| Female                                  | 23.6                    | 1,793         | 14.4                  | 788           |
| International medical graduate*         | 21.3                    | 1,562         | 18.5                  | 992           |
| Years in practice                       |                         |               |                       |               |
| 0–5 y                                   | 17.9                    | 1,287         | 17.1                  | 943           |
| 6–20 y                                  | 54.5                    | 3,904         | 53.5                  | 2,847         |
| More than 20 years                      | 27.7                    | 2,019         | 29.5                  | 1,528         |
| Practice characteristics                |                         |               |                       |               |
| Owner of practice                       | 54.3                    | 3,766         | 66.4                  | 3,361         |
| Solo practice                           | 30.5                    | 2,136         | 33.8                  | 1,695         |
| Two-physician practice                  | 7.0                     | 461           | 8.9                   | 438           |
| Small group practice, 3–9 physicians    | 14.9                    | 1,038         | 19.0                  | 998           |
| Medium group practice, 10–29 physicians | 4.4                     | 324           | 6.3                   | 347           |
| Large group practice, ≥30 physicians    | 5.5                     | 422           | 4.1                   | 214           |
| Group or staff model HMO                | 7.4                     | 624           | 3.5                   | 197           |
| Hospital-owned practice                 | 13.7                    | 996           | 8.6                   | 498           |
| Medical school practice                 | 4.7                     | 355           | 8.9                   | 535           |
| Other practice                          | 12.0                    | 854           | 6.9                   | 396           |
| Specialty <sup>†</sup>                  |                         |               |                       |               |
| Family medicine/GP                      | 45.3                    | 3,168         | —                     | —             |
| General internal medicine               | 32.1                    | 2,364         | —                     | —             |
| Pediatrics                              | 21.0                    | 1,627         | —                     | —             |
| Medical specialty                       | —                       | —             | 40.3                  | 2,381         |
| Surgical specialty                      | —                       | —             | 36.7                  | 1,791         |
| Psychiatry                              | —                       | —             | 12.4                  | 623           |
| Obstetrics or gynecology                | —                       | —             | 10.6                  | 523           |

Source: HSC Community Tracking Study 1996–1997 Physician Survey.

\* International medical graduates include all physicians who graduated from medical schools not in the United States or Puerto Rico.

<sup>†</sup> Specialty designation based on self-report.

imputations, was used to impute percent of practice revenue from managed care (item nonresponse rate of 12%) and income.<sup>33</sup> These imputations were designed to maintain the covariances between closely related variables. Cases with nonimputed missing data were omitted from the multivariate analysis. Observations for 7,210 primary care physicians and 5,318 specialists were included in the descriptive analysis, and 6,961 primary care physicians and 4,765 specialists in the final multivariate models.

## Dependent Variable

Our dependent variable was the level of satisfaction with one's overall career in medicine. Respondents were asked: "Thinking very generally about your overall career in medicine, would you say that you are currently very satisfied, somewhat satisfied, somewhat dissatisfied, very dissatisfied, or neither satisfied nor dissatisfied?" For the univariate analyses, results are reported according to the actual distribution of responses across all response categories (Table 2). For the logistic regression analyses, the dependent variable was coded as a dichotomous variable, where "very satisfied" = 1 and all other response categories = 0. The dependent variable was coded as a dichotomous variable because the satisfaction responses were not normally distributed (Table 2) and because the assumption is generally made that physicians are (or

should be) very satisfied. This approach is consistent with prior research on this topic.<sup>9,10</sup>

## Independent Variables

We included several demographic variables in our model: dichotomous variables indicating whether the practice was located in a metropolitan area, gender, and whether the physician graduated from a U.S. medical school; and categorical variables for years in practice (0 to 5 years [reference group], 6 to 15 years, and >15 years). Four census regions were incorporated in the analysis as simple controls. Three specialty categories for primary care physicians (general and family practice [reference group], general internal medicine, and general pediatrics) were coded. For specialists, categorizations included surgical specialties, psychiatry, obstetrics/gynecology, and medical/other (reference group). The reference group included specialties such as dermatology and neurology, as well as traditional internal medicine subspecialties.

Practice characteristics included a dichotomous variable indicating whether the physician had an ownership interest in the practice and a series of dummy variables representing practice arrangement. Practice arrangements were classified as solo practice (reference category), two-physician practice, groups categorized into three sizes

**Table 2. Distribution According to Level of Satisfaction by Specialty, Practice Characteristics, and Income (All Physicians)\***

|   | Very Satisfied, % | Somewhat Satisfied, % | Somewhat Dissatisfied, % | Very Dissatisfied, % |
|---|-------------------|-----------------------|--------------------------|----------------------|
| <b>Specialty</b>                        |                   |                       |                          |                      |
| Primary care physicians                 |                   |                       |                          |                      |
| Family medicine/general practitioner    | 43.0              | 37.9                  | 13.2                     | 4.1                  |
| General internal medicine               | 37.4              | 40.0                  | 16.2                     | 4.4                  |
| Pediatrics                              | 49.2              | 37.0                  | 10.5                     | 2.2                  |
| Specialists                             |                   |                       |                          |                      |
| Medical specialty                       | 45.5              | 39.7                  | 10.2                     | 2.8                  |
| Surgical specialty                      | 44.7              | 34.2                  | 14.0                     | 5.7                  |
| Psychiatry                              | 39.4              | 37.5                  | 15.8                     | 5.5                  |
| Obstetrics or gynecology                | 33.1              | 40.5                  | 17.5                     | 7.4                  |
| <b>Practice Characteristics</b>         |                   |                       |                          |                      |
| Solo practice                           | 37.5              | 34.7                  | 17.3                     | 8.3                  |
| Two-physician practice                  | 41.9              | 39.7                  | 13.4                     | 4.0                  |
| Small group practice, 3–9 physicians    | 47.6              | 38.4                  | 10.9                     | 2.2                  |
| Medium group practice, 10–29 physicians | 50.0              | 36.1                  | 10.5                     | 3.1                  |
| Large group practice, ≥30 physicians    | 43.7              | 44.4                  | 9.3                      | 0.9                  |
| Group or staff model HMO                | 38.4              | 43.8                  | 16.6                     | 3.2                  |
| Hospital-owned practice                 | 44.7              | 40.8                  | 10.6                     | 2.1                  |
| Medical school practice                 | 49.6              | 37.8                  | 9.8                      | 1.7                  |
| Other                                   | 43.8              | 38.9                  | 12.4                     | 2.7                  |
| <b>Income<sup>†</sup></b>               |                   |                       |                          |                      |
| Quintile 1                              | 37.1              | 36.6                  | 16.3                     | 6.8                  |
| Quintile 2                              | 40.2              | 39.1                  | 14.8                     | 4.5                  |
| Quintile 3                              | 42.3              | 41.2                  | 11.8                     | 3.6                  |
| Quintile 4                              | 47.3              | 37.5                  | 11.1                     | 3.2                  |
| Quintile 5                              | 48.0              | 34.9                  | 12.5                     | 3.6                  |

Source: HSC Community Tracking Study 1996–1997 Physician Survey.

\* Rows do not total 100% because a small number of physicians responded that they were “neither satisfied nor dissatisfied.”

<sup>†</sup> Quintiles were derived from self-reported net practice income for each of the seven specialty categories.

(<10, 10 to 29 and ≥30), staff or group model HMO, hospital-owned practice, medical school-based practice, and other.

As noted, our analytic focus is on the interrelationships between career satisfaction, participation in managed care, compensation, and professional autonomy. To measure managed care participation, we ranked physicians by tercile (i.e., in three equal groups), according to the percent of practice revenue from managed care reported by the physician. With respect to income, the degree to which the physician's income approximates that of peers is hypothesized to affect career satisfaction. To gauge reported income relative to that earned by peers, income quintiles were derived based on self-reported net practice income (after expenses, before taxes) for each of the seven specialty categories identified above. The middle quintile was used as the reference category, reflecting a benchmark of income relative to peers within each specialty category. Uncertainty of income may increase the possibility of dissatisfaction; therefore, we included in multivariate models a dichotomous variable indicating whether the physician was paid on straight salary.

Professional autonomy variables were measured via responses to questions that encompass most aspects of the interface of core professional values and autonomy in the context of clinical practice: clinical autonomy, patient

care issues, relationships with patients, relationships with colleagues, and work effort. These questions included the ability to obtain secondary services such as referrals for patients when medically necessary, to make clinical decisions so as to meet patients' needs, to make clinical decisions in the best interests of patients without the possibility of reducing personal income, to spend adequate time with patients, to consistently provide high quality care, to have continuing relations with patients, to maintain positive levels of communication with medical colleagues, and to provide charity care, along with measures capturing work effort (and, indirectly, personal time).

To measure the ability to obtain needed services, we constructed an index covering five aspects of medical care: hospital admissions, length of stay, ancillary services, referrals to specialists, and diagnostic imaging. Physicians were asked how often they were able to obtain each of these services for patients when medically necessary. A score was constructed for each respondent whereby the numerator reflected the relative difficulty in obtaining needed services and the denominator reflected the number of applicable items for that respondent. The index was internally consistent (Cronbach's  $\alpha = 0.80$ ), demonstrated acceptable levels of reliability, and measured a singular construct.

**Table 3. Relationship between Professionalism/Autonomy, Career Satisfaction, and Percentage of Practice Revenue from Managed Care (Unadjusted)**

|  | Percent Managed Care Revenue |                   |                     |             |                   |                     |
|--|------------------------------|-------------------|---------------------|-------------|-------------------|---------------------|
|  | Primary Care Physicians      |                   |                     | Specialists |                   |                     |
|  | Low                          | Medium            | High                | Low         | Medium            | High                |
| Professionalism and autonomy,<br>Percent who agree with statement*   |                              |                   |                     |             |                   |                     |
| I have the freedom to make clinical decisions that meet my patients' needs   | 89.5                         | 84.4 <sup>†</sup> | 83.7 <sup>†</sup>   | 77.1        | 69.3 <sup>†</sup> | 70.2 <sup>†</sup>   |
| I can make clinical decisions in the best interests of my patients without the possibility of reducing my income   | 82.4                         | 74.6 <sup>†</sup> | 75.3 <sup>†</sup>   | 72.6        | 64.4 <sup>†</sup> | 67.9 <sup>†,‡</sup> |
| I have adequate time to spend with my patients during their office visits  | 73.6                         | 66.6 <sup>†</sup> | 61.0 <sup>†,‡</sup> | 77.8        | 70.1 <sup>†</sup> | 68.9 <sup>†</sup>   |
| It is possible to provide high quality care to all of my patients  | 80.8                         | 83.1              | 80.5 <sup>‡</sup>   | 76.7        | 71.1 <sup>†</sup> | 71.1 <sup>†</sup>   |
| It is possible to maintain the kind of continuing relationships with patients over time that promote the delivery of high quality care                                   | 83.1                         | 76.4 <sup>†</sup> | 74.5 <sup>†</sup>   | 65.1        | 52.3 <sup>†</sup> | 54.0 <sup>†</sup>   |
| The level of communication I have with colleagues about the patients whom I refer or who are referred to me is sufficient to ensure the delivery of high quality of care | 88.1                         | 86.4              | 85.1 <sup>†</sup>   | 76.4        | 73.9              | 74.1                |
| Career Satisfaction  |                              |                   |                     |             |                   |                     |
| Percent "very satisfied" with career   | 44.7                         | 42.4              | 40.4 <sup>†</sup>   | 46.0        | 41.2 <sup>†</sup> | 41.2 <sup>†</sup>   |

Source: HSC Community Tracking Study 1996–1997 Physician Survey.

Managed care terciles: low = 0–25%, medium = 26–50%, high >50% of practice revenue from managed care.

\* Percent of physicians who agree somewhat or agree strongly with statement is reported in this table. Response scale was: agree strongly, agree somewhat, disagree somewhat, disagree strongly, and neither agree nor disagree.

<sup>†</sup> Significantly different from Low Managed Care tercile,  $P < .05$

<sup>‡</sup> Significantly different from Medium Managed Care tercile,  $P < .05$ .

The exact question wording and response scale for the professional autonomy measures appear in Table 3. In our multivariate analyses, we combined respondents into one of two categories for each item: "agree" (either strongly or somewhat) or not.

Provision of charity care, as a core value of the medical profession, was measured by the number of hours provided in the last month (entered as a continuous variable).<sup>34</sup> Work effort and control over personal time were measured as weeks worked in the past year and hours worked per week in the last full week of practice. Hours worked included time spent in all medically related activities, excluding time spent on call when not actually working. In this analysis, we combined weeks worked per year and hours worked per week into a single variable to capture overall work effort and thereby (indirectly) measure personal time. This variable was coded as a dichotomous variable (indicating "overwork") wherein physicians who either worked more than 50 weeks per year or more than 60 hours per week were separated from those who did not. Our rationale for collapsing these variables together in this way stems from the well-known phenomenon that physicians' work schedules are hectic, and we presumed that, at some level, such taxing schedules might negatively impact satisfaction.

All measures are from the Physician Survey, except for gender and international medical graduate status, which

were obtained from the American Medical Association and American Osteopathic Association master files.

## Methods of Analysis

Separate analyses were conducted for primary care physicians and specialists to facilitate analysis of differential determinants between the groups. For the bivariate analyses, two-tailed  $z$  tests were computed to compare differences between proportions. Logistic regressions were used to determine the association between the independent variables and overall career satisfaction. The regressions were conducted in an ordered sequence, at each stage adding additional elements thought to affect physician satisfaction. The first set of models (Model 0, not shown) included demographic and practice characteristics and percent of practice revenue from managed care. The income variables were then added (Model 1), followed by the set of professional autonomy variables (Model 2). The logistic regression models were subjected to the Hosmer-Lemeshow test, which demonstrated good fit.<sup>35</sup> Changes in  $R^2$  values between the models were compared with each addition of a variable or set of variables, to ascertain the relative importance of managed care, income, and the professional autonomy variables (collectively) as determinants of satisfaction. Results of the logistic regression analyses are reported as corrected prevalence ratios (which

equate to measures of relative risk) and were derived from odds ratios using standard techniques.<sup>36</sup>

All results were weighted to be representative of the continental U.S. nonfederal, patient care physician population, taking into account the probability of selection and adjusting for nonresponse.<sup>32</sup> Standard errors used in performing statistical significance tests were generated using SUDAAN (SUDAAN; Research Triangle Institute, Research Triangle Park, NC) and take into account the complex sample design of the survey.<sup>33</sup>

## RESULTS

Description of the sample of primary care physicians and specialists is presented in Table 1. The unadjusted distribution of responses to the career satisfaction question by specialty, practice type, and income category is presented in Table 2. Across all subgroups, large percentages of respondents reported being either “very satisfied” or “somewhat satisfied.” These unadjusted results reveal that physicians in solo practices, obstetrician/gynecologists and psychiatrists, and physicians with relatively lower incomes reported lower levels of satisfaction while pediatricians and medical school faculty reported higher levels of career satisfaction (Table 2).

Relationships between managed care and our professional autonomy variables as well as career satisfaction are presented in Table 3. These unadjusted data indicate that managed care participation was negatively associated with many measures of core professional values and autonomy, as well as with satisfaction. However, the magnitude of the association was limited.

Table 4 presents results from the logistic regression models. These results demonstrate that multiple measures of professional autonomy have strong independent and positive associations with career satisfaction, after controlling for other factors. In conceptualizing these key characteristics of medical practice, the cluster of variables measuring various facets of professional autonomy encompasses the array of predominant determinants. Not surprisingly, income relative to peers also emerged as a strong predictor of overall career satisfaction. This effect held after controlling for factors that might be expected to exert an influence on income, such as specialty, years in practice, work effort, gender, and employment arrangement.

Consistent with widespread perceptions, the effect of managed care participation on satisfaction was negative (Model 1, Table 4). However, this effect was comparatively weak and disappeared after controlling for professional autonomy (Model 2, Table 4). Importantly, when managed care and income were included in the model without the professional autonomy measures, both were significantly associated with career satisfaction, with managed care exerting a negative effect and income a positive effect (Model 1). The addition of income to the model incorporating demographic characteristics, practice arrangements, and managed care participation did not alter the regression

results in any appreciable way, and resulted in an increase in the explained variance of less than one percent. When measures of professional autonomy were added, however, the negative influence of managed care on career satisfaction disappeared (Model 2), and the  $R^2$  value increased markedly (Tables 4 and 5). Of note, the absolute values of these  $R^2$ s closely approximate those reported in prior research that employed designs similar to our own.<sup>12,18</sup> Taken together, these findings suggest that the negative effect of managed care is exerted through its impact on professional autonomy and not through income.

## Other Findings

International medical graduates consistently reported lower levels of career satisfaction than U.S. medical school graduates. With the exception of international medical graduates, few demographic or control variables predict satisfaction. Physicians who practiced in groups generally reported higher levels of satisfaction than did solo physicians. Physicians in medical school settings reported significantly higher levels of career satisfaction compared to physicians in other practice settings.

## Sensitivity Analyses

We conducted analyses to test the sensitivity of our models and to assess whether our findings were robust. For example, we replicated the multivariate models focusing on those physicians who were very dissatisfied or somewhat dissatisfied (as the dependent variable), and found that, while the directions of the effects reversed, the magnitude/significance of the major results were basically unchanged from those presented in Table 4.

In separate analyses, we employed different measures of managed care to better define its influence. Models were developed using other formulations of practice-level managed care—different cut points, utilizing capitated revenue instead of all managed care revenue—but the results remained essentially the same. In a series of parallel sensitivity analyses, market-level measures of managed care penetration and physician supply also were included. No substantively different effects were observed when these market-level variables were added to the models. Finally, the work effort variables (hours worked per week and weeks worked per year) were broken out, and coded as continuous variables; these modifications did not appreciably affect either the magnitude of the coefficients or the significance levels of the results.

## DISCUSSION

The results of this study demonstrate the strong, consistent, and robust effects of professional autonomy—broadly defined—on physician satisfaction. Among our measures, the strongest determinants of career satisfaction for physicians include being able to: obtain medically necessary services for patients, have adequate time to

**Table 4. Results of Logistic Regression: Prevalence Ratios for Being Very Satisfied with Overall Career in Medicine**

|   | Primary Care Physicians        |                                | Specialists                    |                                |
|---|--------------------------------|--------------------------------|--------------------------------|--------------------------------|
|   | Model 1<br>Prevalence<br>Ratio | Model 2<br>Prevalence<br>Ratio | Model 1<br>Prevalence<br>Ratio | Model 2<br>Prevalence<br>Ratio |
| Demographic characteristics   |                                |                                |                                |                                |
| Practice located in metropolitan area   | 0.84 <sup>†</sup>              | 0.91                           | 0.88                           | 1.05                           |
| Female  | 1.04                           | 1.08                           | 1.10 <sup>‡</sup>              | 1.17 <sup>†</sup>              |
| International medical graduate  | 0.84*                          | 0.82*                          | 0.79*                          | 0.80*                          |
| Years in practice   |                                |                                |                                |                                |
| 5 or less (reference group)   | 1.00                           | 1.00                           | 1.00                           | 1.00                           |
| 6 to 20   | 0.91 <sup>‡</sup>              | 0.91                           | 0.92                           | 0.96                           |
| 21+   | 1.00                           | 0.93                           | 1.13 <sup>‡</sup>              | 1.18 <sup>†</sup>              |
| Specialty   |                                |                                |                                |                                |
| Family or general practice (PCP reference group)                              | 1.00                           | 1.00                           |                                |                                |
| General internal medicine   | 0.90 <sup>‡</sup>              | 0.90 <sup>‡</sup>              |                                |                                |
| Pediatrics  | 1.20*                          | 1.15*                          |                                |                                |
| Medical specialty (specialist reference group)                                |                                |                                | 1.00                           | 1.00                           |
| Surgical specialty  |                                |                                | 1.00                           | 0.99                           |
| Psychiatry  |                                |                                | 0.88 <sup>‡</sup>              | 1.08                           |
| Obstetrics/gynecology   |                                |                                | 0.73*                          | 0.74*                          |
| Practice type   |                                |                                |                                |                                |
| Solo practice (reference group)   | 1.00                           | 1.00                           | 1.00                           | 1.00                           |
| Two-physician practice  | 1.07                           | 1.09                           | 1.09                           | 1.08                           |
| Small group practice, 3–9 physicians  | 1.27*                          | 1.28*                          | 1.17 <sup>†</sup>              | 1.16 <sup>†</sup>              |
| Medium group practice, 10–29 physicians                                       | 1.32*                          | 1.35*                          | 1.19 <sup>‡</sup>              | 1.14                           |
| Large group practice, ≥30 physicians  | 1.23 <sup>†</sup>              | 1.16 <sup>‡</sup>              | 1.05                           | 0.99                           |
| Group or staff model HMO  | 1.18 <sup>‡</sup>              | 1.05                           | 1.05                           | 0.81                           |
| Hospital-owned practice   | 1.21 <sup>†</sup>              | 1.16 <sup>‡</sup>              | 1.24 <sup>†</sup>              | 1.20                           |
| Medical school practice   | 1.42*                          | 1.40*                          | 1.35*                          | 1.40*                          |
| Other   | 1.27 <sup>†</sup>              | 1.25 <sup>†</sup>              | 1.17                           | 1.13                           |
| Percent practice revenue from managed care                                    |                                |                                |                                |                                |
| Lowest third (reference group)  | 1.00                           | 1.00                           | 1.00                           | 1.00                           |
| Middle third  | 0.98                           | 1.06                           | 0.86*                          | 0.95                           |
| High third  | 0.86 <sup>†</sup>              | 0.92                           | 0.92                           | 1.01                           |
| Pay, specialty income quintiles   |                                |                                |                                |                                |
| 1, lowest   | 0.88 <sup>†</sup>              | 0.90 <sup>‡</sup>              | 0.86 <sup>‡</sup>              | 0.87                           |
| 2, medium low   | 0.90 <sup>‡</sup>              | 0.89 <sup>‡</sup>              | 0.96                           | 0.98                           |
| 3, middle (reference group)   | 1.00                           | 1.00                           | 1.00                           | 1.00                           |
| 4, medium high  | 1.02                           | 1.04                           | 1.20*                          | 1.21 <sup>†</sup>              |
| 5, highest  | 1.15 <sup>†</sup>              | 1.22*                          | 1.18 <sup>†</sup>              | 1.16 <sup>‡</sup>              |
| Core professional value and autonomy  |                                |                                |                                |                                |
| Can obtain medical services for patients when needed <sup>§</sup>             |                                | 1.51*                          |                                | 1.44*                          |
| Has freedom to make clinical decisions to meet patients' needs <sup>  </sup>  |                                | 1.38*                          |                                | 1.21*                          |
| Can make clinical decisions without negatively affecting income <sup>  </sup> |                                | 1.21*                          |                                | 1.21*                          |
| Has adequate time during patient visits <sup>  </sup>                         |                                | 1.30*                          |                                | 1.20*                          |
| Possible to provide high-quality care to all patients <sup>  </sup>           |                                | 1.27*                          |                                | 1.21*                          |
| Can maintain continuing relationships with patients <sup>  </sup>             |                                | 1.47*                          |                                | 1.24*                          |
| Has adequate communication with colleagues <sup>  </sup>                      |                                | 1.12 <sup>‡</sup>              |                                | 1.12 <sup>†</sup>              |
| Amount of charity care provided (hours per month)                             |                                | 1.00                           |                                | 1.00                           |
| Works more than 60 hours per week or 50 weeks per year                        |                                | 0.92                           |                                | 1.03                           |
| R <sup>2</sup>  | 0.03                           | 0.12                           | 0.04                           | 0.12                           |

Source: HSC Community Tracking Study 1996–97 Physician Survey.

\* P < .001.

<sup>†</sup> P < .01.

<sup>‡</sup> P < .05.

<sup>§</sup> Physicians who always or almost always agreed that they could obtain specified medical services when medically necessary. This variable is an index created using the mean of five different measures of physicians' abilities to obtain needed services (see text).

<sup>||</sup> Physicians who strongly or somewhat agreed with statement. Reference group consists of physicians who strongly or somewhat disagreed with the statement, or who neither agreed nor disagreed.

Also included in model but not significant predictors of physician career satisfaction: ownership of practice, fixed salary compensation. Census region was a significant predictor of satisfaction but is omitted from the table because it is a control variable.

**Table 5. Change in R<sup>2</sup> after Excluding Independent Variables from Logistic Regression**

| Contents of Multivariate Logistic Regression Models   | Model R <sup>2</sup> |             | Change in R <sup>2</sup> * |             |
|---|----------------------|-------------|----------------------------|-------------|
|   | PCPs                 | Specialists | PCPs                       | Specialists |
| Model 2: demographics, specialty, practice characteristics, income, managed care, and professional autonomy | 0.116                | 0.119       | N/a                        | N/a         |
| Model 2: excluding percent of physician practice revenue from managed care                                  | 0.114                | 0.119       | 0.002                      | 0.0003      |
| Model 2: excluding income   | 0.111                | 0.112       | 0.004                      | 0.007       |
| Model 2: excluding professional autonomy  | 0.032                | 0.039       | 0.084                      | 0.080       |

Source: HSC Community Tracking Study 1996–1997 Physician Survey

\* Change in R<sup>2</sup> after dropping a variable or set of variables from the logistic model with all covariates, i.e., Model 2 in Table 4. PCP, primary care physician; N/a, not available.

spend with patients, have the freedom to make clinical decisions, maintain ongoing relationships with patients, work in an environment where it is possible to provide high-quality care, make clinical decisions without the potential of negatively affecting income, and maintain adequate levels of communication with other physicians (Tables 4 and 5). Notably, two dimensions of professional autonomy (provision of charity care and work effort, respectively) were not found to be associated with career satisfaction. The two exceptions might be a reflection of the burdensome nature of these professional obligations; i.e., it seems intuitive that receiving professional prerogatives is associated with satisfaction, while fulfilling professional obligations is not.

Our cluster of measures captures physicians' perceptions of professional obligations, professional prerogatives, and autonomy in their own medical practices. Often these dimensions of professional autonomy are closely intertwined. Our findings elucidate how these core professional attributes coalesce to shape overall career satisfaction. A strength of this analysis is that it examines associations between variables that were asked without direct reference to managed care. This study is not an attitudinal survey about managed care, and the survey did not ask leading questions about physicians' attitudes toward managed care or their perceptions of managed care's impact on autonomy or on income.

Consistent with other research, these results show higher levels of satisfaction among academic physicians.<sup>13</sup> This might reflect something unique about the academic medical environment that we have not specified in our analysis, such as positive influences of teaching and research, high levels of perceived prestige, or perhaps a shielding effect provided by academic environments against certain impacts of managed care.

With respect to limitations of our work, many of our measures are perceptions and not purely objective measures. Moreover, some of our key variables may be endogenous, possibly resulting in selection bias. Endogeneity refers to situations in which the relationships between independent and dependent variables are not unidirectional. For example, preferences and expectations pertaining to professional autonomy (in all of its dimensions) probably exert an influence (through self-selection)

on specific career decisions; i.e., the degree to which one places value on autonomy will probably influence choice of practice and the degree of managed care participation. However, because the direction in which selection bias might affect our results would almost certainly be to reduce the observed effects, our estimates can only plausibly be understated. Inasmuch as our observed effects are strong, this endogeneity concern (or selection bias) is not a major threat to our primary conclusion.

An additional limitation of this work relates to the validity of the managed care revenue variable. These data are self-reported and as such are prone to reporting error, and validation studies of physicians' responses to survey questions about percentage of practice revenues from managed care have not been undertaken. However there is no reason to suspect that such error would systematically bias the results.

Among the most important findings of this study is that managed care exerts its effect on career satisfaction through impacts on professional autonomy. The negative effect of managed care persists after controlling for income, but disappears after controlling for professional core values and autonomy. This result suggests that the negative effect exerted by managed care is explained by the limitations it can impose on practice autonomy and professionalism. Indeed, we demonstrated that managed care is negatively associated with some of the key core values, including professional autonomy (Table 3). Managed care is known to vary across a wide spectrum in the degree to which it interferes with physicians' traditional ethos of placing the interest of the patient first. To the degree that managed care either does or does not infringe upon physicians' clinical and professional relationships, practice modes, prerogatives, and decision making, the magnitude of the impact from managed care on satisfaction will vary.

Results from studies with analytic approaches similar to our own have suggested that managed care need not lead to dissatisfaction so long as central aspects of professionalism, clinical autonomy, and scheduling remain under the control of physicians.<sup>12</sup> Managed care organizations (MCOs), health plans, networks, and physician organizations have at their disposal various means of affecting (either negatively or positively) physicians' clinical autonomy such as: preauthorization requirements, use of



economic incentives designed to curb high-cost services, formularies and other restrictions on prescription drugs, and disease management programs based upon protocols. MCOs should view any infringements upon physicians' professional autonomy as a set of tradeoffs, involving both potential savings and potential costs. To the degree that MCOs value physician satisfaction, and especially where resultant cost savings are minimal, MCOs can minimize those intrusions on autonomy that are most objectionable to physicians. The following steps have been suggested as possible actions that could be taken by MCOs to safeguard physician satisfaction: 1) critically review the limits placed on clinical autonomy, 2) strive to increase patient confidence in physicians, 3) involve physicians in the processes of setting reimbursement and work schedules, and 4) work with physicians to develop collaborative approaches to difficult decision making regarding limit setting.<sup>12</sup>

There are obvious implications of this work for private sector decision makers and for all stakeholders in large health care organizations. Reactions to operational shifts such as United Healthcare's recent policy change to forego preauthorization for physicians' clinical decisions provide evidence of the importance of this level of health plan-physician interface to all affected parties.<sup>37,38</sup> This shift came about after United recognized that minimal cost savings were being realized for the heavy administrative and political price of the preauthorization requirement.<sup>37,38</sup>

These findings also have critical and fundamental significance in the public policy arena. Where tradeoffs between the savings achievable via imposed limits and the political fallout resulting from such actions become especially contentious, legislative remedies are sought. Policymakers then must grapple with the difficult tradeoffs in debates over legislative proposals to curb limitations on autonomy.<sup>39</sup> Our analysis provides a clearer understanding of the interrelationship between managed care, professional autonomy, income, and career satisfaction among physicians. Subsequent rounds of the Community Tracking Study Physician Survey will allow for tracking of trends in these critical areas.

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