

Special Article

CHANGES IN THE SCOPE OF CARE PROVIDED BY PRIMARY CARE PHYSICIANS

ROBERT F. ST. PETER, M.D., MARIE C. REED, M.H.S., PETER KEMPER, PH.D., AND DAVID BLUMENTHAL, M.D., M.P.P.

ABSTRACT

Background Strategies to control medical costs and improve the quality of care often translate into decisions affecting the range of services primary care physicians provide to patients, which patients are referred for specialty care, and the points in disease processes at which referrals are made. This study focused on physicians' assessments of changes in the scope of care provided by primary care physicians and their assessments of the appropriateness of the scope of the care that primary care physicians are expected to provide.

Methods We analyzed data from the 1996–1997 Community Tracking Study Physician Survey. Telephone interviews were conducted with 12,385 physicians (reflecting a response rate of 65 percent) who were drawn from a representative random sample of physicians providing direct patient care in the continental United States and not employed by the federal government. The analysis was based on responses from the 7015 primary care physicians and 5092 specialists who had been in practice for at least two years.

Results Thirty percent of the primary care physicians and 50 percent of the specialists reported that the scope of care provided by primary care physicians had increased during the previous two years. Twenty-four percent of the primary care physicians and 38 percent of the specialists reported that the scope of care expected to be provided by primary care physicians was greater than it should be. According to multivariate analysis, primary care physicians other than general or family practitioners (i.e., pediatricians and general internists), those who were in one- or two-physician practices, those who received revenues from capitation, and those who served as gatekeepers for their patients' care were significantly more likely to report that the scope of care they were expected to provide was greater than it should be.

Conclusions The finding that nearly one in four primary care physicians reported that the scope of care they were expected to provide was greater than it should be arouses concern about the potential impact of changes in the delivery of health care. The associations we found between financial and administrative aspects of managed care and physicians' concern about the scope of care they provide to their patients deserve careful consideration. (N Engl J Med 1999;341:1980-5.)

©1999, Massachusetts Medical Society.

STRATEGIES to control medical costs and improve the quality of care are often designed to change the way that physicians, particularly primary care physicians, practice medicine. Managed-care plans and physician groups have established a variety of financial and administrative incentives to increase the role of primary care physicians in providing care. The use of capitation, risk pools, gatekeeping, and practice profiles may increase pressure on physicians to contain health care costs by reducing unnecessary or marginally beneficial services.¹⁻³ For primary care physicians, this can translate into decisions that affect the range of services they provide to patients, which patients they refer for specialty care, and at what point in the disease process a referral is made.^{4,5}

One potential result of these strategies is that primary care physicians may be expected to provide a broader range of services and to care for sicker patients than in the past.⁶ To date, however, there is no systematic information about whether the scope of care provided by primary care physicians is changing, or whether physicians are concerned about the scope of care that primary care physicians are expected to provide. Moreover, important potential relations between incentives designed to manage care and the scope of care provided by primary care physicians have not been analyzed empirically.

We report findings from a recent national survey in which more than 12,000 primary care physicians and specialists assessed changes in the scope of care provided by primary care physicians and the appropriateness of the scope of the care that primary care physicians are expected to provide.

METHODS**Data Source**

In this study, we analyzed data from the Community Tracking Study Physician Survey. The survey, designed to be representative of physicians providing direct patient care in the continental United

From the Kansas Health Institute, Topeka (R.E.S.); the Center for Studying Health System Change, Washington, D.C. (M.C.R., P.K.); and the Institute for Health Policy, Massachusetts General Hospital—Partners Health-Care System and the Departments of Medicine and Health Care Policy, Harvard Medical School, Boston (D.B.). Address reprint requests to Dr. St. Peter at Kansas Health Institute, 100 S.E. Ninth St., Third Fl., Topeka, KS 66612-1212, or at rstpeter@khi.org.

States and in selected communities, followed a complex design with 60 sites and a small, independently drawn national sample.^{7,8}

American Medical Association and American Osteopathic Association Master Files were used to obtain the sample frame. The sample included active office- and hospital-based physicians, not employed by the federal government, who spent at least 20 hours per week in direct patient care in the continental United States. Residents and fellows, as well as physicians in certain specialties such as radiology, anesthesiology, and pathology, were excluded. For sampling purposes, physicians whose primary specialty was family or general practice, general internal medicine, or pediatrics were classified as primary care physicians. Primary care physicians were oversampled. Within physician strata and within sites, physicians were selected randomly.⁸

A sample of 23,096 physicians was obtained, of whom 18,947 were eligible for the survey. Between August 1996 and August 1997, 12,385 physicians were interviewed by telephone, representing a response rate of 65 percent.⁹ The findings reported here are based on responses from the 12,107 physicians (7015 primary care physicians and 5092 specialists) who had been in practice for at least two years.

The rate of nonresponse to individual items in the survey was very low, typically less than 3 percent. Missing values for some independent variables were imputed. Additional information on the survey can be found elsewhere.^{9,10}

Assessing the Scope of Care

The scope of care provided by primary care physicians was defined in this study in terms of the complexity or severity of conditions for which primary care physicians provide care without referral to specialists. To assess change in the scope of care, primary care physicians were asked: "During the last two years, has the complexity or severity of patients' conditions for which you provide care without referral to specialists: increased a lot, increased a little, stayed about the same, decreased a little, or decreased a lot?" With the same response categories, specialists were asked: "During the last two years, has the complexity or severity of patients' conditions at the time of referral to you by primary care physicians . . . ?" For descriptive analysis, this five-point response scale was collapsed into three categories: "increased," "stayed about the same," and "decreased." For the multivariate analysis, the response scale was dichotomized into "increased" or "stayed about the same or decreased."

To assess the appropriateness of the scope of care, primary care physicians were asked: "In general, would you say that the complexity or severity of patients' conditions for which you are currently expected to provide care without referral is: much greater than it should be; somewhat greater than it should be; about right; somewhat less than it should be; or much less than it should be?" With the same response categories, specialists were asked: "In general, would you say that the complexity or severity of patients' conditions at the time of referral to you by primary care physicians is . . . ?" Again, for descriptive analysis, this five-point response scale was collapsed into three categories, "greater than it should be," "about right," and "less than it should be." For the multivariate analysis, the response scale was dichotomized into "greater than it should be" and "about right or less than it should be."

Independent Variables

Physicians' attitudes and behavior can be seen as a function of their individual characteristics, the type of practice setting, and their experience with managed care in their own practices, as well as community-level factors.¹¹

Individual characteristics included in this analysis were years in practice since completing training, specialty, sex, allopathic or osteopathic training, foreign or U.S. medical education, and board certification (information on sex, allopathic or osteopathic training, and foreign or U.S. medical education was obtained from the American Medical Association and American Osteopathic Association Master Files; all other information was obtained during a

telephone interview). For analytic purposes, primary care physicians were defined as those who spent the majority of their time in general or family practice; adolescent, geriatric, or general internal medicine; general pediatrics; or combined internal medicine and pediatrics. Physicians in all other specialties, including obstetrics and gynecology, were classified as specialists.

Practice settings were classified as 1- or 2-physician practices; group practices consisting of 3 to 10, 11 to 50, or more than 50 physicians; hospital-based practices; medical schools and universities; group- or staff-model health maintenance organizations (HMOs); and "other" settings.

Two dimensions of exposure to financial aspects of managed care were included in the analysis: the proportion of total practice revenue derived from capitation, and the proportion of practice revenue derived from all sources of managed care (defined as revenue from all HMOs, preferred-provider organizations, independent practice associations, and point-of-service plans, including Medicare and Medicaid managed-care plans).

Administrative aspects of managed care included in this analysis were measures of gatekeeping, practice profiling, and patient-satisfaction surveys. For gatekeeping, primary care physicians indicated the percentage of their patients who were required by insurance plans or medical groups to obtain permission from them before seeing a specialist. For the other two measures, physicians were asked to assess the effect on their practice of medicine of practice profiling (defined as "comparing your pattern of using medical resources to treat patients with that of other physicians") and patient-satisfaction surveys. Six-point response scales were collapsed into three categories: "large effect" ("very large" or "large"), "some effect" ("moderate," "small," or "very small"), and "no effect."

Characteristics of the communities in which physicians practice are likely to influence physicians' assessments of the appropriateness of the scope of care provided by primary care physicians. To control for variation among sites in these characteristics, dummy variables were included in the multivariate analysis.

Statistical Analysis

For the descriptive analysis, two-tailed z-tests were used to compare differences in proportions. Logistic regression was used to determine the association between primary care physicians' assessments of the appropriateness of the scope of care expected of them (dichotomized into "greater than it should be" and "about right or less than it should be") and the independent variables. To account for potential nonlinear relations between primary care physicians' assessments of the scope of care they were expected to provide and variables with continuous responses, some independent variables were converted into categorical variables (e.g., percentage of revenue derived from all managed care and capitation and percentage of patients subject to gatekeeping arrangements).

It was hypothesized that physicians' assessments of the appropriateness of scope of care would be affected by the reported change in their own scope of care. Accordingly, change in scope of care (dichotomized into "increased" and "stayed about same or decreased") was included as an independent variable in the analysis.

To provide more meaningful comparisons between sites, the site-level means were adjusted by using regression coefficients to control for site-level differences in physician populations.

The results presented here were weighted to be representative of the population of physicians providing direct patient care in the continental United States and not employed by the federal government, with the probability of selection taken into account and nonresponse adjusted for.^{9,10} The software package SUDAAN was used to account for the complex sample design when standard errors were generated for tests of statistical significance.¹⁰

RESULTS

Assessments of the Appropriateness of the Scope of Care

Thirty percent of primary care physicians reported that the scope of care they provided to their patients

TABLE 1. PHYSICIANS' ASSESSMENTS OF THE CHANGE IN PRIMARY CARE PHYSICIANS' SCOPE OF CARE.*

CHANGE IN PREVIOUS 2 YEARS	PRIMARY CARE PHYSICIANS (N=7015)	SPECIALISTS (N=5092)
	percent	
Increase	30±0.6	50±0.8
No change	61±0.6	45±0.7
Decrease	9±0.3	5±0.4

*Plus-minus values are means ±SE.

TABLE 2. PHYSICIANS' ASSESSMENTS OF THE APPROPRIATENESS OF PRIMARY CARE PHYSICIANS' SCOPE OF CARE.*

SCOPE OF CARE	PRIMARY CARE PHYSICIANS (N=7015)	SPECIALISTS (N=5092)
Greater than should be	24±0.8	38±0.8
About right	71±0.8	53±1.0
Less than should be	4±0.3	9±0.4

*Plus-minus values are means ±SE. Because of rounding, percentages do not all total 100.

without referral to specialists had increased over the previous two years (Table 1). An even higher proportion of specialists (50 percent) reported that the scope of care provided by primary care physicians had increased during the same period.

A substantial majority of primary care physicians (71 percent) reported that the scope of care they were expected to provide without referral to specialists was about right (Table 2). Nearly one of every four primary care physicians (24 percent) reported that the scope of care they were expected to provide was greater than it should be. Among specialists, more than one in three (38 percent) reported that the complexity or severity of patients' conditions at the time patients were referred to them by primary care physicians was greater than it should be.

Factors Associated with the Assessments

The proportion of primary care physicians who reported that the scope of care they were expected to provide was greater than it should be was more than twice as high among those who also reported that their scope of care had increased (44 percent) as among those who reported that their scope of care

had remained the same (15 percent) or decreased (17 percent) ($P<0.001$ for both comparisons).

Bivariate analyses showed that among primary care physicians, concern about the appropriateness of the scope of care they were expected to provide varied significantly according to individual characteristics, practice settings, and experience with managed care (Table 3). Some of the relations found in the bivariate analyses ceased to be significant when other factors were controlled for in the multivariate analysis. The discussion below focuses primarily on the results of the multivariate model.

Individual Characteristics

In the multivariate model, physicians with more experience were somewhat less likely to report concern about the appropriateness of the scope of care that primary care physicians were expected to provide. Both pediatricians and general internists were more likely than family physicians or general practitioners to report that the scope of care they were expected to provide was greater than it should be.

Practice Setting

Primary care physicians in 1- or 2-physician practices were more likely than physicians in other practice settings (large group practices of more than 50 physicians, medical school or university practices, group- or staff-model HMOs, and small group practices of 3 to 10 physicians) to report concern about the appropriateness of the scope of care they were expected to provide.

Financial Incentives

After other factors were controlled for, primary care physicians in practices with managed-care revenue were no more or less likely than those in practices without managed-care revenue to express concern about the appropriateness of the scope of care they were expected to provide. However, primary care physicians in practices that derived 1 to 75 percent of their revenue from capitation were significantly more likely than those in practices with no capitated revenue to report concern about the appropriateness of the scope of care expected of them. At very high proportions of capitated revenue (more than 75 percent of practice revenue), the relation with concern about appropriateness was not statistically significant.

Administrative Incentives

Participation in gatekeeping and the extent of that participation were strongly associated with primary care physicians' concern about the appropriateness of the scope of care they were expected to provide. This relation was consistent, even at high levels of participation in gatekeeping (more than 85 percent of patients).

Primary care physicians who reported that practice

CHANGES IN THE SCOPE OF CARE PROVIDED BY PRIMARY CARE PHYSICIANS

TABLE 3. FACTORS ASSOCIATED WITH PRIMARY CARE PHYSICIANS' ASSESSMENT THAT THE SCOPE OF CARE EXPECTED OF THEM WAS GREATER THAN IT SHOULD BE.*

FACTOR	SAMPLE SIZE	PERCENT REPORTING SCOPE TOO GREAT	MULTIVARIATE ODDS RATIO (95% CI)	FACTOR	SAMPLE SIZE	PERCENT REPORTING SCOPE TOO GREAT	MULTIVARIATE ODDS RATIO (95% CI)
	no.						
All primary care physicians†	7015	24					
Individual characteristics				Financial incentives			
Years in practice				Total managed-care revenue			
2–5‡	1103	30	1.00	None‡	369	17	1.00
6–10	1447	27	0.95 (0.77–1.17)	1–20%	1226	24§	1.15 (0.80–1.66)
11–20	2449	22§	0.84 (0.71–1.00)§	21–40%	1699	23§	0.88 (0.57–1.36)
>20	2016	21§	0.89 (0.73–1.08)	41–60%	1531	24§	0.85 (0.55–1.31)
Specialty¶				61–85%	1496	27§	0.87 (0.58–1.32)
Family or general practice‡	3112	22	1.00	>85%	694	27§	0.91 (0.57–1.43)
General internal medicine	2224	27§	1.27 (1.10–1.48)	Revenue from capitation			
General pediatrics	1566	25	1.20 (1.01–1.42)§	None‡	1765	18	1.00
Sex				1–10%	1463	24§	1.46 (1.14–1.86)
Female‡	1721	31	1.00	11–25%	1203	26§	1.47 (1.14–1.91)
Male	5294	22§	0.68 (0.58–0.78)**	26–50%	1458	29§	1.50 (1.13–1.99)
Type of medical training				51–75%	578	30§	1.54 (1.11–2.14)§
Allopathic‡	6353	23	1.00	>75%	548	26§	1.29 (0.89–1.88)
Osteopathic	662	33§	1.92 (1.59–2.32)**	Administrative incentives			
Graduate of foreign medical school				Patients in gatekeeping arrangements			
No‡	5511	22	1.00	None‡	515	15	1.00
Yes	1504	34§	1.49 (1.28–1.73)**	1–20%	1882	21§	1.57 (1.13–2.20)
Board certified				21–40%	1550	25§	2.02 (1.42–2.87)**
No‡	1474	28	1.00	41–60%	1186	27§	2.18 (1.51–3.14)**
Yes	5536	23§	0.88 (0.74–1.03)	61–85%	1095	29§	2.22 (1.57–3.14)**
Practice characteristics				>85%	787	31§	2.39 (1.60–3.59)**
1 or 2 physicians‡	2552	27	1.00	Effect of practice profiles on practice of medicine			
Group practice	1786	20§		None‡	1238	21	1.00
3–10 physicians	1051	20§	0.76 (0.61–0.94)§	Some	5023	23	1.03 (0.82–1.28)
11–50 physicians	401	23	0.83 (0.61–1.11)	Large	693	35§	1.37 (0.98–1.91)
>50 physicians	290	15§	0.44 (0.32–0.61)**	Effect of patient-satisfaction surveys on practice of medicine			
Group- or staff-model HMO	608	24	0.61 (0.45–0.81)**	None‡	968	21	1.00
Medical school or university	331	23	0.59 (0.43–0.81)	Some	3914	23	1.05 (0.86–1.27)
Hospital-based	959	24	0.86 (0.69–1.07)	Large	2084	28§	1.00 (0.81–1.24)
Other	779	24	0.83 (0.67–1.02)	Change in scope of care in previous 2 years			
				None or decreased‡	4812	16	1.00
				Increased	2186	44§	4.12 (3.59–4.72)**

*Dummy variables for 60 sites were included in the model but are not presented here. Table 4 shows the results for 12 high-intensity (heavily oversampled) sites. Multivariate P values are for underlying coefficients in logistic regression. For each analysis, physicians with missing data that were not imputed have been excluded. CI denotes confidence interval.

†Primary care physicians in practice for less than two years are excluded.

‡Physicians in this category served as the reference group. P values are for the comparison with the reference group.

§P<0.05.

¶Physicians in adolescent or geriatric internal medicine or combined internal medicine and pediatrics have been excluded.

||P<0.01.

**P<0.001.

profiles and patient-satisfaction surveys had some effect or a large effect on their practice of medicine were no more or less likely than others to express concern about the scope of care they were expected to provide.

Changes in the Scope of Care

Primary care physicians who reported an increase in their scope of care over the previous two years were

much more likely than other primary care physicians to report that the scope of care they were expected to provide was greater than it should be (odds ratio, 4.12; 95 percent confidence interval, 3.59 to 4.72).

Differences According to Community

Even after adjustment for differences in physicians' characteristics among communities, remarkable dis-

TABLE 4. COMMUNITY VARIATION IN PRIMARY CARE PHYSICIANS' ASSESSMENT THAT THE SCOPE OF CARE EXPECTED OF THEM WAS GREATER THAN IT SHOULD BE.*

LOCATION	UNADJUSTED ESTIMATE	REGRESSION-ADJUSTED ESTIMATE	MULTIVARIATE ODDS RATIO (95% CI)
	percent		
Boston	19†	17	0.70 (0.45–1.09)
Cleveland	33†	28	1.46 (0.98–2.17)
Greenville, S.C.	14†	18	0.76 (0.51–1.13)
Indianapolis	18†	17	0.71 (0.47–1.06)
Lansing, Mich.	20†	18	0.77 (0.53–1.12)
Little Rock, Ark.	18†	20	0.87 (0.58–1.30)
Miami	33†	29‡	1.52 (1.03–2.26)‡
Newark, N.J.	36†	30‡	1.58 (1.05–2.40)‡
Orange County, Calif.	39†	35‡	2.09 (1.40–3.12)‡
Phoenix, Ariz.	30	26	1.31 (0.87–1.97)
Seattle	21†	21	0.92 (0.61–1.37)
Syracuse, N.Y.	17†	20	0.84 (0.52–1.36)

*Values are percentages of physicians in practice for at least two years. The variation between site means is significant by the adjusted Wald test (test value=51.8, $P<0.001$). CI denotes confidence interval.

† $P<0.05$ for the comparison with physicians in metropolitan areas of more than 200,000 population.

‡ $P<0.05$ for the comparison with metropolitan areas of more than 200,000 population for physicians in the independently drawn national sample, on the basis of the underlying logistic regression.

parities were found in the proportion of primary care physicians who expressed concern about the expected scope of care. Among the 12 sites for which the samples were large enough to allow precise estimates at the community level, there was twofold variation in the regression-adjusted proportions of primary care physicians who reported that the scope of care they were expected to provide was greater than it should be (Table 4).

DISCUSSION

An expanded role for primary care physicians has been advocated in the past decade as a means to obtain cost-effective, high-quality care.¹² In this survey, physicians reported that the medical conditions treated by many primary care physicians have increased in complexity and severity in recent years. Moreover, a sizable minority of both primary care physicians and specialists reported concern about the scope of care expected from primary care physicians.

General internists and general pediatricians are more likely than family physicians or general practitioners to express concern about the appropriateness of the scope of care expected of them. Whether this reflects a greater level of comfort among family physicians with broader clinical responsibilities, as a result of either self-selection into family practice or the type of training they receive,¹³ cannot be determined from these data.

The more frequent use of “curbside” consultations in multispecialty group practices^{14,15} and other supportive aspects of large practices^{16,17} may contribute to the finding that primary care physicians in group practices are significantly less likely than those in one- or two-physician practices to report concern about the scope of care expected of them. However, it is not possible to determine from these data whether self-selection of physicians into various practice settings confounds the relation between the practice setting and the degree of concern about the scope of care expected of primary care physicians.

Managed care, in its many manifestations, has often been criticized for its potential to place inappropriate restrictions and expectations on primary care physicians.^{2,18,19} There has been little empirical information, however, either to support or to refute these assertions. Our study indicates that some specific aspects of managed care, such as capitation and gate-keeping arrangements, are associated with concern on the part of primary care physicians about the appropriateness of the scope of the care they are expected to provide.

Primary care physicians who reported an increase in the scope of care were much more likely to be concerned about the appropriateness of the expected scope of care. The extent to which these physicians might become comfortable over time with the broader scope of care cannot be determined from these data.

There was significant variation between communities in the proportions of primary care physicians who expressed concern about the appropriateness of the scope of the care they were expected to provide. Many market-level factors, including the supply and distribution of physicians, prevailing norms and standards in the medical community, competitive pressures, and the specific characteristics of the type of managed care in a health care marketplace, are all likely to play a part in this variation. Additional research should be undertaken to determine the relative importance of the specific characteristics of health care markets and their particular forms of managed care that have an influence on this and other aspects of the delivery of medical care.

The data reported here have limitations. As in all surveys, the data are subject to possible reporting error by the respondents and to potential response bias not accounted for by statistical adjustment. The information on the scope of care and participation in managed-care arrangements was self-reported and was not independently verified. Because the results are based on a cross section of physicians' views, we do not know whether the physicians were more or less concerned about the appropriateness of the scope of care primary care physicians are expected to provide than they had been in the past. It is possible that the respondents' attitudes toward changes in the health

care system in general, and to managed care in particular, influenced their responses. Confirming whether the reported changes in the scope of care provided by primary care physicians actually occurred, and measuring the potential effect of such changes on quality of care and clinical outcomes, would require the review of medical records and other data and was beyond the scope of this study. Finally, the recent increase in point-of-service options and the less restrictive choice of providers in many plans may affect physicians' perspectives on these issues.

An increase in the scope of care provided by primary care physicians is, in itself, neither a positive nor a negative aspect of change in health care systems. However, the finding that nearly one in four primary care physicians was concerned about the expected scope of care raises questions about the effect of current changes in the delivery of health care. The competence of primary care physicians is fundamental to the quality of care delivered to their patients.²⁰

Regardless of the reasons for the reported increase in the scope of care provided by primary care physicians and their concern about current expectations, appropriate steps should be taken to ensure that all primary care physicians are adequately prepared to fulfill their expanding roles effectively. Furthermore, as changes in the health care system create incentives for primary care physicians to take a more prominent role in caring for patients, particularly those with complex medical conditions, it is important to monitor closely the quality of care, as well as the availability and accessibility of services more appropriately provided by specialists.

Supported by the Robert Wood Johnson Foundation.

Presented in part at the annual meeting of the Association for Health Services Research, Chicago, June 16, 1997.

We are indebted to Ellen Singer and Leif Kavrell of Social and Scientific Systems for excellent programming assistance.

REFERENCES

- Hillman AL, Pauly MV, Kerstein JJ. How do financial incentives affect physicians' clinical decisions and the financial performance of health maintenance organizations? *N Engl J Med* 1989;321:86-92.
- Kassirer JP. Managed care and the morality of the marketplace. *N Engl J Med* 1995;333:50-2.
- Kerr EA, Mittman BS, Hays RD, Siu AL, Leake B, Brook RH. Managed care and capitation in California: how do physicians at financial risk control their own utilization? *Ann Intern Med* 1995;123:500-4.
- Grembowski DE, Cook K, Patrick DL, Roussel AE. Managed care and physician referral. *Med Care Res Rev* 1998;55:3-31.
- Grumbach K, Osmond D, Vranizan K, Jaffe D, Bindman AB. Primary care physicians' experience of financial incentives in managed-care systems. *N Engl J Med* 1998;339:1516-21.
- Kassirer JP. Access to specialty care. *N Engl J Med* 1994;331:1151-3. [Erratum, *N Engl J Med* 1994;331:1535.]
- Kemper P, Blumenthal D, Corrigan JM, et al. The design of the Community Tracking Study: a longitudinal study of health system change and its effects on people. *Inquiry* 1996;33:195-206.
- Metcalf CE, Kemper P, Kohn LT, Pickreign JD. Site definition and sample design for the Community Tracking Study. Washington, D.C.: Center for Studying Health System Change, 1996. (Technical publication no. 1.)
- Keil L, Potter F, Reed MC. Community Tracking Study physician survey. Round 1. Survey methodology report. Washington, D.C.: Center for Studying Health System Change, 1998. (Technical publication no. 9.)
- Reschovsky JD, Edson D, Moore G, et al. Community Tracking Study physician survey public use file: user's guide. Round 1, release 1. Washington, D.C.: Center for Studying Health System Change, 1998. (Technical publication no. 10.)
- Eisenberg JM. Doctors' decisions and the cost of medical care: the reasons for doctors' practice patterns and ways to change them. Ann Arbor, Mich.: Health Administration Press, 1986.
- Starfield B, Simpson L. Primary care as part of US health services reform. *JAMA* 1993;269:3136-9.
- Rosser WW. Approach to diagnosis by primary care clinicians and specialists: is there a difference? *J Fam Pract* 1996;42:139-44.
- Keating NL, Zaslavsky AM, Ayanian JZ. Physicians' experiences and beliefs regarding informal consultation. *JAMA* 1998;280:900-4.
- Kuo D, Gifford DR, Stein MD. Curbside consultation practices and attitudes among primary care physicians and medical subspecialists. *JAMA* 1998;280:905-9.
- Hirth RA, Fendrick AM, Chernew ME. Specialist and generalist physicians' adoption of antibiotic therapy to eradicate *Helicobacter pylori* infection. *Med Care* 1996;34:1199-204.
- Robinson JC, Casalino LP. Vertical integration and organizational networks in health care. *Health Aff (Millwood)* 1996;15(1):7-22.
- Hillman AL. Health maintenance organizations, financial incentives, and physicians' judgments. *Ann Intern Med* 1990;112:891-3.
- Idem*. Financial incentives for physicians in HMOs: is there a conflict of interest? *N Engl J Med* 1987;317:1743-8.
- Lundberg GD, Lamm RD. Solving our primary care crisis by retraining specialists to gain specific primary care competencies. *JAMA* 1993;270:380-1.