

Patient-Centered Clinical Decisions and Their Impact on Physician Adherence to Clinical Guidelines

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BACKGROUND. This study was undertaken to assess the impact of traditionally unmeasured patient-centered factors on primary care physicians' decisions to adhere to an evidence-based clinical practice guideline for heart failure.

METHODS. Experimental and control scenarios were developed to test three patient-centered factors hypothesized to influence physician nonadherence to a heart failure guideline: patient concerns about finances, quality of life, and location of care. Each factor represented an implicit patient goal potentially in conflict with a goal of the guideline recommendations. A control scenario for one factor and an experimental scenario for a second were placed within a cross-sectional survey and questionnaires were mailed by random assignment to 978 Upstate New York family physicians. Experimental and control responses were compared by chi square.

RESULTS. The response rate was 47% (n=456). Each hypothetical patient-centered factor resulted in significant reductions in physicians' predicted adherence. Reductions in reported pharmaceutical usage and testing of left ventricular (LV) function were associated with patient financial difficulties ($P < .01$). The poor quality-of-life scenario was associated with reduced testing for LV function but increased discussion of advance directives ($P < .01$). The clinical scenario limiting access to services for a rural patient was associated with decreases in physician choice of LV function tests and cardiology referrals ($P < .05$).

CONCLUSIONS. Patient-specific factors are associated with physician decisions to comply with guideline recommendations. These findings suggest that performance profiles measuring physician adherence to guidelines should be interpreted with caution, and that current case-mix methodologies may not adequately control for patient-centered factors that may influence health care quality.

KEY WORDS. Quality of health care; guidelines, medical decision making; patient-centered care; physicians, family. (*J Fam Pract* 1998; 46:311-318)

Significant variation in practice patterns exists between geographic regions, health care systems, and specialties, and also exists within specialties.^{1,2} These findings are typically taken to mean that deficiencies exist in the quality of patient care. Evidence-based clinical practice guidelines are viewed as one mechanism for improving quality by reducing inappropriate variations in medical practice.^{3,5} As such, measures of physician adherence to these guidelines may become the acceptable standard for evaluation of

quality in health care.^{6,8} However, disease-specific assumptions about quality may not apply to specific patients in all settings,⁹ and judging the variability in physician adherence may be more problematic than health researchers perceive. Clinical guidelines as educational tools highlight the importance of patient preferences, but measures of physician adherence to clinical guidelines do not adequately allow for this variability.

The evaluation of variability in physician adherence to guidelines is important, but equally important is an examination of the appropriateness of the variations that exist. Recent evidence suggests that patient and community factors may play a significant role in the practice variations found in health services research.¹⁰⁻¹² Studies of patient-centered medicine¹³ and participatory decision-making¹⁴ have found improved outcomes by incorpo-

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rating patient-specific goals into the care plan. In primary care, deviation from clinical guidelines may reflect attention given to patient-care goals that conflict with the goals of the clinical guideline. However, previous studies of physician adherence to clinical guidelines have not examined patient-specific factors in detail.¹⁵

This article describes a study of the effect of three patient-specific factors on physician clinical decisions for treating congestive heart failure (systolic dysfunction). Our goal was to present experimental and control scenarios that would be indistinguishable from one another through traditional case-mix adjustments (eg, the patients have the same socioeconomic status, race, sex, and severity of heart failure). Instead, they differed by a nondisease factor that might conflict with a guideline recommendation, coupled with the patient verbalizing concerns. In this way, we explored whether physicians' attention to providing quality interpersonal care may conflict with providing quality technical care.

METHODS

EXPERIMENT AND SCENARIO DESIGN

Patient-centered factors that might influence physician decisions were recommended by a panel of physicians. This panel was composed of one academic cardiologist and 11 family physicians who represented rural and urban, academic and nonacademic, group and solo, managed care and fee-for-service practices. Experiments measuring five of these factors were developed using pairs of experimental and control scenarios that identically summarized the biomedical and socioeconomic information necessary to make management decisions about the patient's heart failure. The control scenario did not present any patient-centered conflict with providing the care recommended in the clinical guideline. In each experimental scenario, the personal factor was described as an implicit fear or goal addressed by the patient or spouse that might be interpreted as conflicting with specific clinical guideline recommendations. After a pretest with 40 family medicine residents and faculty, three of the five experiments were selected.

Experiment 1 was a scenario about financial difficulties. A patient concerned about being able to afford his health care (experimental scenario) was

compared with a clinically identical patient without such concerns (control scenario). In Experiment 2, reduced quality of life because of a co-morbidity (Alzheimer's disease) was studied. In addition to describing the patient in the experimental scenario as having advanced Alzheimer's disease and requiring home health care, the patient's wife mentions her concerns about maintaining her husband's comfort. In the control scenario, the patient has early Alzheimer's disease and no implication of marginal quality of life is made. Experiment 3 exposed the physician to a patient who wished to remain in her community with family, where she had limited access to cardiologists, echocardiograms, and cardiac catheterization facilities. In all instances, cardiovascular status remained identical. The experimental and control scenarios used in each experiment are presented in Table 1.

After reading a scenario, the physician rated his or her likelihood of performing activities recommended in the heart failure guideline sponsored by the Agency for Health Care Policy and Research (AHCPR).¹⁶ The recommendations measured had varying degrees of evidence, with only two supported by scientific evidence. Specifically, we queried respondents about the hypothetical utilization of left ventricular ejection fraction (LVEF) tests, exercise treadmill tests, pharmaceuticals (eg, angiotensin-converting enzyme [ACE] inhibitors, diuretics, and digoxin), referral to a cardiologist, and discussions of advance directives and low-sodium diet. Of these, the use of ACE inhibitors and the measurement of LVEF were supported scientifically. The same set of recommended treatments and actions was used with the experimental and control scenarios, and a 4-point Likert-type scale, ranging from very unlikely to very likely, was used with all items. All but the "low-sodium diet" item were measured in at least two of the three experiments; some guideline recommendations did not apply to all scenarios.

QUESTIONNAIRE AND SAMPLING

The three experiments were conducted in 1995 within a larger cross-sectional examination of physicians' views and utilization of guidelines in general,¹⁶ as well as their knowledge about the AHCPR heart failure guideline. To reduce the length of the survey, three versions of the ques-

TABLE 1

Experimental and Control Scenarios Used in Each Experiment to Determine Physician Adherence to AHCPR Heart Failure Guidelines

**Experiment 1
Financial Difficulties**

Control Scenario

Mr Smith is an active 61-year-old carpenter with hypertension and no complications from an MI suffered 1 year ago. His medications were HCTZ 25 mg daily and one aspirin daily. **He has adequate health insurance from his wife's company policy.** At his last visit, he presented with clinical signs of volume overload and early symptoms of congestive heart failure, but no chest pain. Chest x-ray film confirmed an enlarged heart and mild pulmonary edema while his ECG showed no significant change and normal sinus rhythm. At that last visit, you initiated treatment for congestive heart failure as an outpatient and educated him about a low-sodium (2 g) diet. Today, he thanks you, as he feels he is back to his baseline activity.

Experimental Scenario

Mr Smith is an active 61-year-old carpenter with hypertension and no complications from an MI suffered 1 year ago. His medications were HCTZ 25 mg daily and one aspirin daily. At his last visit, he presented with clinical signs of volume overload and early symptoms of congestive heart failure, but no chest pain. Chest x-ray film confirmed an enlarged heart and mild pulmonary edema while his ECG showed no significant change and normal sinus rhythm. At that last visit, you initiated treatment for congestive heart failure as an outpatient and educated him about a low-sodium (2 g) diet. Today, he thanks you, as he feels he is back to his baseline activity. However, **he remains worried about his reduced income, his lack of health insurance, and the cost of his medications.**

**Experiment 2
Reduced Quality of Life**

Control Scenario

Mr Lawrence is a 67-year-old with **early** Alzheimer's disease, **but is otherwise healthy and lives at home with his wife.** They have come to your office for a follow-up visit. From the history, physical examination and laboratory studies, you suspect he may also now have congestive heart failure; this is supported by chest x-ray film.

Experimental Scenario

Mr Lawrence is a 67-year-old with **advanced** Alzheimer's disease. **He remains at home, but requires almost total care by his wife and a home health nurse.** They have come to your office for a follow-up visit and **Mrs Lawrence expresses her concern about his steadily deteriorating quality of life, and her desire to maintain his comfort.** From the history, physical examination and laboratory studies, you suspect he may also now have congestive heart failure; this is supported by chest x-ray film.

**Experiment 3
Perception of Limited Access**

Control Scenario

Mrs Rowinski is a 70-year-old with type 1 diabetes who **lives 10 minutes from your practice.** Mrs. Rowinski had an uncomplicated MI four years ago and at last visit had symptoms of congestive heart failure, but denied chest pain and had no ECG changes with normal sinus rhythm. Cardiology consultation with an echocardiogram, a MUGA scan, and a catheterization laboratory are only available at a **local hospital that is another 15-minute** drive from your office. Today, she is not improved following your initial attempt at outpatient management (ACE inhibitor and diuretic) and, **if hospitalization is needed, she agrees to comply.**

Experimental Scenario

Mrs Rowinski is a 70-year-old with type 1 diabetes who **lives in a rural community 30 minutes from your practice. Mrs Rowinski and her daughter expressed having difficulty in arranging transportation to your practice.** She had an uncomplicated MI four years ago and at last visit had symptoms of congestive heart failure, but denied chest pain and had no ECG changes with normal sinus rhythm. Cardiology consultation with an echocardiogram, a MUGA scan, and a catheterization laboratory are only available at a **local hospital that is another 1-hour** drive from your office. Today, she is not improved following your initial attempt at outpatient management (ACE inhibitor and diuretic) and, **if hospitalized, she prefers to remain at your local hospital.**

HCTZ denotes hydrochlorothiazide; MUGA, radionuclide ventriculography; ECG, electrocardiogram.

Note: Text was bolded in this table only to assist in the comparison of the patient factor descriptions.

tionnaire were created, each including only 2 scenarios: a control scenario from one experiment and an experimental scenario from another. All other questions were identical.

One of the versions was mailed to all members of the New York State Academy of Family Physicians practicing in Upstate New York; those located in the seven counties encompassing the New York City metropolitan area were excluded. To ensure equal response to the three questionnaires from rural, suburban, and urban communities, the sampling areas were divided into zip code regions. The physician lists in each zip code region were ordered alphabetically, and in repeated rotation, the first, second, or third questionnaire was mailed to each practitioner. A follow-up postcard was sent 2 weeks after the first mailing, and a second questionnaire and follow-up postcard was sent to all nonresponders. To increase the number of physicians in this subsample, a third copy of the survey was mailed to all nonrespondent physicians located in the rural zip code regions. After removing all physicians who had changed addresses or retired, the final sample size was 978. Power analysis demonstrated that the subsample sizes were sufficiently large to detect differences across each experiment's control and experimental scenario groups. Given an alpha level $\leq .05$, the calculated values for most items ranged from 85% to 99% power.¹⁸

ANALYSES

Chi-square analyses, comparing the physician and practice characteristics across the subsamples who received the three questionnaires, were completed to determine any sampling biases and examine any potential confounding variables that may have affected the differences found between experimental and control groups. Chi-square tests were run to compare the responses between the experimental and control groups of each experiment.

RESULTS

After three mailings, 459 (47%) family physicians returned surveys. Our randomization and nonresponse follow-up strategies were effective, achieving similar overall response rates for the three questionnaires, as well as similar rates within the

individual zip code regions. Furthermore, there were no significant differences in the response rates of the three survey versions across number of years since graduating from medical school, physician sex, type of community, or type of practice.

Nearly all respondents were board certified (96%), the majority were male (80%), and they had graduated from medical school an average of 18 ± 10 years ago. Most were in solo practices (23%), partnerships (18%), or single-specialty groups (21%). A majority of the respondents were in smaller, more rural communities; 54% stated they practiced in small, mid-sized, or large rural towns, and 30% were located in small communities within 25 miles of a metropolitan area. These demographics were similar to analogous statewide statistics of family physicians.¹⁹

CLINICAL SCENARIOS

Experiment 1: Perceived Financial Difficulties. Findings suggest that patient financial concerns influenced family physicians' reported decisions to utilize care recommended in the AHCPR heart failure guideline (Table 2). There was a 9% reduction in the percentage of family physicians who stated that they would prescribe an ACE inhibitor for a patient with financial difficulties. Fewer family physicians in the experimental group (69% vs 86% in the control group) reported ordering an evaluation of LVEF by radionuclide ventriculography (MUGA) or echocardiogram. Additionally, loop diuretics were chosen significantly less often (10% reduction) by physicians responding to the patient with financial barriers. Interestingly, although the clinical information in these scenarios did not fit the guideline's recommended criteria for prescribing digoxin, significantly more physicians in the experimental group responded as likely (or very likely) to prescribe this drug. It is unclear whether physicians were substituting the use of digoxin for an ACE inhibitor. Physicians' responses for discussion of advance directives and use of stress testing were not significantly different between the experimental and control groups.

Experiment 2: Perceived Reduced Quality of Life Because of a Co-morbidity. Family physicians responded differently to the heart failure

patient with varying quality-of-life concerns because of Alzheimer's disease (Table 2). Physicians were more likely to indicate that they would discuss advance directives (9% increase) and less likely to use an LVEF test (39% decrease) to evaluate the patient with reduced quality of life. There was no difference in physicians' decisions to prescribe pharmaceuticals or to recommend a low-sodium diet between the experimental and control groups.

Experiment 3: Patient Preferences Related to Access of Care. The significant reduction in physicians' intention to measure LVEF (15%) and refer to a cardiologist (17% reduction) demonstrated the influence of patient preferences related to environmental barriers and reduced access to care on medical decision-making (Table 2). The

increased responses for prescribing digoxin and reduced responses for exercise treadmill testing were not statistically significant. Decisions to discuss advance directives were nearly identical.

DISCUSSION

This study suggests that medical decisions in primary care are affected by patient preferences distinct from the biomedical aspects of disease. This insight, although not new to family physicians, is extremely important for those who would measure health care quality through measures of physician adherence to disease-specific guidelines. Physicians responded to hypothetical patient financial constraints by reducing expenditures; to quality-of-life concerns by comforting the patient and limiting the recommended evaluation; and to

separation from loved ones by not transferring the patient to a distant facility with optimal resources. We make no judgment on which physician responses to hypothetical scenarios reflect a higher level of quality, but variation in responses is likely purposeful. Yet, physicians who did not adhere to the guidelines because of patient preferences would be judged as practicing lower quality medicine as measured by performance profiles. Though the physicians confronted with these personal patient factors were less likely to follow the specific recommendations of the clinical guideline, their responses may be consistent with broader definitions of quality patient care.

Disease-specific measures of quality reflect only one aspect of care. The context in which illness presents, the factors that contribute to the patient seeking medical care, and the concerns or prefer-

TABLE 2

The Influence of Patients' Concerns on Family Physicians' Reported Decisions to Utilize Care Recommended in the AHCPR Heart Failure Guideline

Experiment Predicted Treatment	% of Negative Responses*		P Value†
	Experimental Scenario	Control Scenario	
1. Financial Difficulties	(n = 142)	(n = 165)	
ECHO/MUGA	38	14	<.01
ACE Inhibitor	11	1	<.01
Diuretic	23	12	<.01
Digoxin	44	57	.02
Advance directive	16	21	NS
Exercise treadmill	61	53	NS
2. Reduced Quality of Life	(n = 149)	(n = 142)	
ECHO/MUGA	60	27	<.01
ACE inhibitor	9	14	NS
Diuretic	7	9	NS
Low-sodium diet	27	19	NS
Advance directives	3	15	<.01
Referral cardiologist	86	84	NS
3. Perception of Limited Access	(n = 165)	(n = 149)	
ECHO/MUGA	23	8	<.01
Digoxin	17	26	NS
Advance directives	9	8	NS
Referral cardiologist	39	25	.01
Exercise treadmill	52	42	NS

ECHO/MUGA denotes echocardiogram or radionuclide ventriculography.

*Percents represent those physicians who reported that they would be "unlikely" or "very unlikely" to order the test or provide the treatment specified.

†The significance values presented are for the chi-square tests comparing the one portion of negative responses by physicians in the control and experimental groups.

ences the patient has about his or her overall situation are important variables that primary care physicians consider. This investigation empirically documents the importance of these clinical contexts and illustrates the limits of current definitions of quality, especially with respect to performance profiles. Disease-centered models of quality measurement may only be generalizable to pertinent disease-related factors and perhaps not to the patients associated with them. Family physicians should interpret these results as emphasizing the importance of recording rationales for decisions contrary to guideline recommendations in medical records, especially when decisions are in response to personal nondisease factors.

While physician and health system factors may be accurately measured in current health services research models for assessing quality and outcomes, these models do not accurately account for personal factors and preferences, and thus are limited in their ability to fully explain practice variability. The personal factors studied here have case-mix indicators, such as insurance status and zip codes, but these do not measure personal perceptions of financial concerns or patient reluctance to travel away from their community. New measures of case-mix methodology²⁰ even control for the quality-of-life factor contained in experiment 2. Yet, our study suggests that the patient perceptions of these may be more important than the impersonal demographic indicators. Although all three patient variables are approximated by measures of case mix, these measures could lack the sensitivity to accurately detect patient differences. Health services research defines patient characteristics as impersonal demographic features, while physicians may ignore demographic characteristics and define patient characteristics as personal contributors to medical decision-making.

The measurement of adherence to evidence-based clinical guidelines is emerging as the cornerstone for measuring the process components of quality. For example, RAND researchers²¹ analyzed the AHCPR heart failure clinical guideline's recommendations to develop standards for acceptable physician compliance rates, or performance profiles. Within our study, patient-specific factors appeared to reduce physician adherence to evidence-based recommendations to unacceptable levels, as compared with proposed quality stan-

dards. Specifically, the compliance rates of 90% to 95% adherence, suggested for both use of ACE inhibitors and use of diuretics, were not met in the first experimental scenario concerning financial difficulties. Meanwhile, the measurement of LVEF was below this standard compliance range for both the control and experimental groups in all three experiments. This finding may reflect deficiencies in family physician knowledge about the importance of this test, but may also be due to other factors, such as the time frame of adherence relative to the scenario (ie, one may choose to do the test at a later time). Notably, the respondents' differences were as great for scientifically based recommendations as for those that were based on expert opinion.

The literature has stressed the importance of patient preferences in clinical guideline development and application^{2,22} and patient-physician interaction in quality-care measurement.^{23,24} Palmer et al²⁵ suggest that patient factors may influence physicians' "inconsistent patterns" of adherence to multiple guidelines. Studies suggesting that primary care physicians use fewer technological interventions than other specialists may reflect the influence of personal factors on decision-making (ie, a patient-centered approach).^{26,27} Our work emphasizes the important effect patient preferences may have on performance profiles and the threat these factors may have on the validity of current assessment methodologies. Additionally, this work suggests that the clinical validity and efficacy of utilizing evidence-based guidelines as quality evaluation tools are threatened if patient goals are not adequately measured; without these measures we may confuse uniformity with quality.

The patient and the patient-physician decision-making process are important factors to consider in evaluating practice guideline adherence, clinical guideline effectiveness, and health care quality measurement. This study responds to this need by measuring physician responses to hypothetical scenarios as a proxy for actual adherence to the clinical guideline recommendations. Scenarios have been applied in examination of the effects of socioeconomic status²⁸ and HIV serostatus,²⁹ but not in the context of patient goals. The findings by Redelmeier and Tversky,³⁰ that different decisions were made when considering the individual person rather than a population of individuals, further

emphasize the need to study such goals. Although attitudes and intentions elicited through scenario methods did predict actual behaviors in other investigational areas,³¹ there is no direct evidence that responses to these scenarios represent actual practice.³² Furthermore, the wording and structure of the scenarios may have had an impact on our findings. We emphasize that this is an exploratory work on medical decision-making.

A limitation to our study is the low response rate. The experimental design of this study suggests our results are internally valid. The low response rate, however, diminishes the generalizability of these findings. Responding family physicians may be representative of primary care providers, but not of other physicians. One might hypothesize that differences exist between physicians in varying roles within the health care system.³³ This exploratory study does offer further evidence that patient-centered factors are influential in medical decision-making.

CONCLUSIONS

Physician adherence to evidence-based clinical guidelines is gaining acceptance as the "gold standard" for quality measurement, improvement, and cost control. The patient-specific factors in our study were associated with physician decisions to comply with guideline recommendations. These findings suggest that performance profiles measuring physician adherence to guidelines should be interpreted with caution, and that current case-mix methodologies may not adequately control for patient-centered factors that may influence health care quality in primary care. Ignoring these factors will limit the usefulness of quality measurements based solely on clinical guideline adherence. The incorporation of personal preferences in the establishment of patient goals is central to valid measures of health care quality.

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