Primary Care Physicians' Evaluation and Treatment of Depression

Results of an Experimental Study Using Video Vignettes

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Little is known about how patient and primary care physician characteristics are associated with quality of depression care. The authors conducted structured interviews of 404 randomly selected primary care physicians after their interaction with CD-ROM vignettes of actors portraying depressed patients. Vignettes varied along the dimensions of medical comorbidity, attributions regarding the cause of depression, style, race/ethnicity, and gender. Results show that physicians showed wide variation in treatment decisions; for example, most did not inquire about suicidal ideation, and most did not state that they would inform the patient that there can be a delay before an antidepressant is therapeutic. Several physician characteristics were significantly associated with management decisions. Notably, physician age was inversely correlated with a number of quality-of-care measures. In conclusion, quality of care varies among primary care physicians and appears to be associated with physician characteristics to a greater extent than patient characteristics.

Keywords: depression; physician decision making; primary care; standardized patients

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Depression is common among primary care patients, but it is often underrecognized and undertreated (Kessler et al., 2005; Simon, Fleck, Lucas, & Bushnell, 2004; A. S. Young, Klap, Sherbourne, & Wells, 2001). Detection rates have increased in recent years, but fewer than half of patients receive adequate acute-phase treatment (Katon et al., 2004; Simon et al., 2004; A. S. Young et al., 2001). Recent changes in health care delivery have resulted in an increased emphasis on primary care treatment of depression. For example, one major insurer recently decided to pay primary care physicians to use a depression screener for patients with chronic medical conditions (Aetna, 2005). Many patients receive suboptimal care because of structural factors such as visit length (Simon et al., 2004) and other difficulties that physicians encounter when working in health systems that do not support primary care treatments for disorders such as depression. In addition, some physicians provide suboptimal communication behaviors such as patient education (Simon, 1998). Physicians' delivery of specific educational messages (e.g., continue the medication even if you are feeling better) have been associated with increased adherence (Bull et al., 2002; Lin et al., 1995). In a recent study, patients with mild to moderate severity received poorer care than did those with minimal or extremely severe symptoms (Joo, Solano, Mulsant, Reynolds, & Lenze, 2005). Adherence to depression treatment guidelines in primary care has been shown to predict improvement in depression (Hepner et al., 2007).

Nonetheless, little is known about how patient and provider factors are associated with quality of care. Most existing information is limited by the inability to control fully for patient variables. For example, lack of adequate antidepressant treatment may reflect patient reluctance or a provider's limitations. Simulated patient methodology, including virtual and standardized patients, has been used effectively in clinical research to assess the impact of patient and provider variables on health care professionals' decisions (Badger et al., 1994; Durante, McKinlay, Kasten, & Potter, 1997; M. D. Feldman, Franks, Epstein, Franz, & Kravitz, 2006; Kales, Neighbors, Blow, et al., 2005; Kales, Neighbors, Valenstein, et al., 2005; Kravitz et al., 2006; McKinlay, Lin, Freund, & Moskowitz, 2002; Schulman et al., 1999; Shahabudin, Almashoor, Edariah, & Khairuddin, 1994; H. N. Young, Bell, Epstein, Feldman, & Kravitz, 2006). For example, one group used videotaped presentations of simulated patients to assess the impact of patient characteristics on primary care providers' decision making (H. A. Feldman et al., 1997; McKinlay et al., 2002).

In the present study, we examine physician and patient factors associated with depression care decisions for primary care patients. This research is based on a theoretical framework that assumes that both factors will influence physician decision making. In this study, we experimentally manipulate key patient variables and measure key physician variables. Our theoretical model is based on the framework outlined by Van Ryn and Fu (2003) in which both patient and physician variables are expected to contribute to variations in physician decision making.

To control for potential confounders, we used an experimental design in which CD-ROM patient vignettes were presented to randomly sampled physicians who were randomized to view 1 of 16 unique vignettes. By doing so, we were able to ensure that each physician was presented with patients with identical depression symptoms. We expected that physician variables such as age would contribute to variations in decision and explored the role of patient variables.

In this article, we describe the following:

1. Primary care physicians' treatment decisions for depression;
2. The relation between four patient variables (i.e., medical illness comorbidity, attribution regarding the cause of depression, race/ethnicity, and gender) and physicians' decisions;
3. The relationship between physician characteristics (i.e., specialty, age, gender, race/ethnicity, and board certification) and physicians' decisions, after controlling for the experimentally manipulated patient variables.

In this study, the physician decision outcomes were (a) diagnosing depression, (b) inquiring about suicidal ideation, (c) prescribing an antidepressant, (d) prescribing an SSRI antidepressant in particular (for physicians who prescribed an SSRI, discussion of two problematic and common side effects—(e) sexual dysfunction and (f) gastrointestinal side effects), (g) counseling performed by the physician himself or herself, and (h) referring patient to external mental health care. Study outcomes were chosen because they are key decision outcomes (e.g., prescribing an antidepressant), and others were chosen because the evidence base indicates that they should be considered (e.g., suicidal thoughts in a depressed patient).

New Contribution

It is important that this research goes beyond previous studies by using a methodology designed to achieve all of our main goals: to present realistic vignettes, to assess provider treatment decisions, to control patient variables experimentally, and to study a large and diverse sample of providers. Previous research has used videotaped presentations of simulated patients with geriatric depression and other medical conditions to assess the impact of patient characteristics on primary care providers' decision making (H. A. Feldman et al., 1997; McKinlay et al., 1998; McKinlay et al., 2002). Our methodology seeks to extend such research by (a) using interactive

CD-ROM vignettes to enhance realism, (b) experimentally manipulating different patient variables, (c) studying a larger sample of participants, and (d) assessing provider decision making with more extensive interviews.

Method

Research Design

The overall design of the study was the presentation of 1 of 16 randomly assigned CD-ROM case vignettes of a patient with explicit depression to each primary care physician–participant. The study employed a $2 \times 2 \times 2 \times 2$ factorial design. The physician "interacted" with the virtual patient by asking prescribed questions that appeared on the screen.

Construction of CD-ROM Interactive Clinical Vignettes

Video vignettes depicted a mid-50s individual with a major depressive episode presenting for a primary care office visit. Symptoms included anhedonia, insomnia, decreased appetite, low energy, and diminished concentration. Focus groups, individual interviews with primary care patients, and transcripts from actual physician–patient encounters (Cooper et al., 2003) were used to create preliminary scripts portraying language between a physician and a patient with moderate depression. Scripts were then reviewed by an expert panel of physicians.

W.H. and colleagues experienced with the production of medical vignettes modified the scripts to create 16 unique virtual programs. Although these scenarios did not differ in their presentation of depression, the vignettes differed on four other factors: race/ethnicity (African American vs. European American), gender, medical illness (two months after myocardial infarction [MI] vs. generally healthy), and attribution of the cause of depression (i.e., believing that stress is causing depressive symptoms vs. believing that a physical problem is causing depressive symptoms). Medical illness and attributions were varied because they were areas of interest of the investigators and because depression was in the primary care setting; race/ethnicity and gender were varied to have demographic variability. Thus, four factors were dichotomized, generating 16 distinct combinations. Vignettes also differed with respect to a fifth factor—whether or not the person expressed a willingness to receive mental health treatment. This factor was not analyzed as an experimental factor for this report, however, because this information was presented only after participants had discussed their recommendations for mental health treatment.

Four actors were hired to portray depressed patients (African American male and female, European American male and female). The final 7-min vignettes were taped and transferred to CD-ROM. Selection of actors, creation of the virtual depressed

patients, and interactive technology used in this study were created under the direction of W.H. and staff from Interactive Drama Inc.

Sample and Recruitment Process

The sample of physicians for this study was derived from a database provided by the American Medical Association. We identified 2,251 primary care physicians with phone numbers who were within our sampling region (Washington, D.C., Primary Metropolitan Statistical Area and Baltimore, Maryland, Primary Metropolitan Statistical Area) to serve as our pool of potential participants. In the original grant, we used a conservative power requirement of 90% to determine our target sample size of 500 participants. In an effort to obtain sufficient representation of African American physicians and equal representation of internists and family physicians, physicians were stratified by race/ethnicity (African American and non–African American) and specialty (family physician and internist). We then attempted to sample approximately equal numbers of family physicians and internists as well as approximately 20% African American physicians. Recruitment commenced in October 2002 and was completed in March 2004.

Potential participants were mailed an invitation to participate, which included a description of the study and a postcard refusal option. After 12 days, physicians were contacted by telephone to determine eligibility and willingness to participate. On average, five calls ($M = 4.91$, $SD = 4.38$) were needed to secure a time to interview the physicians. Physicians were compensated $125 for participation.

Research Interview

Two research team members conducted the semistructured interviews. Interviewers were trained during the piloting phase of the study. One interviewer was a female graduate student from a local counseling psychology program. The second interviewer was a bachelor's-level female research assistant. Both interviewers received training from the principal investigator on the conduct of the semistructured interviews. Training included a review of audiotaped practice tapes and observed practice with feedback.

Approximately half of the randomly selected physicians were assigned to each interviewer. The semistructured interview and the paper-and-pencil survey were conducted in the physician's office and completed in 45 to 55 minutes. Physicians were asked to imagine that the patient was being seen for a first visit after referral from a recently retired colleague.

First, each physician was presented with a "distraction" virtual case vignette in conjunction with a mock medical chart. This vignette depicted a patient with uncomplicated diabetes mellitus. Physicians were asked about their diagnostic and treatment

approach to that patient. The distraction vignette was included to reduce the likelihood that the physician would unduly focus on depression for the experimental vignette.

Using SPSS random numbers generator, we created a randomized chart of all possible vignettes (2^4) for the expected 500 participants. Once the physician agreed to participate, he or she was presented with the next randomly sorted CD-ROM vignette.

Second, each physician was presented with the experimental depression case and a mock medical chart and a one-page summary of medical history, medications, and social history. Each physician "interacted" with the CD-ROM vignettes by asking prescripted questions into a microphone. The actor then "responded" to the questions. For example, the physician asked, "Why do you think you have been feeling this way?" The actor then "responded" to the physician: "I don't know. . . . I think it's stress." A second example includes the following exchange between the physician and patient. The physician asked, "Are you having trouble sleeping?" And the patient "responded,"

> Well, until recently, I've never had any trouble sleeping. I go to bed around 11 and I can usually fall asleep right away. But now, since my heart attack, I wake up in the middle of the night and just lie there worrying about things—money, my kids, mostly my health. After an hour or so, I'll get back to sleep, but I never really feel rested anymore.

After viewing the CD-ROM, physicians were asked questions about assessment (i.e., "Based on the information presented in the case vignette, what additional information would be essential for you to obtain about this patient's clinical condition?"), diagnosis (i.e., "Other than the diagnoses indicated in the medical chart, what are the diagnoses that you are considering for this patient?"), and treatment (i.e., "What are your leading treatment recommendations for this patient?").

In addition to these three study-focused questions, we asked the physicians detailed questions about their treatment plan. For example, when the participants indicated that they would prescribe a medication, we asked questions about dosage, length of treatment, and what they would say to the patient when prescribing the medication. Similarly, when the participants suggested they would recommend office-based counseling, we asked questions about frequency and length of treatment and what they might discuss in the context of those office-based counseling sessions. Interviewers also asked physicians their reasoning behind their decision making related to assessment, diagnosis, and treatment recommendations (i.e., "Please explain the reasoning behind your leading diagnoses.").

On completion of the semistructured interview, participants were asked to complete a brief survey describing themselves (e.g., gender, birth date, race, and specialty), their practice patterns (e.g., board certification, administrative duties), and their knowledge about depression care (knowledge data have not yet been analyzed).

The interviews were audiotaped, transcribed, and coded by the same two research team members who conducted the interviews. Coding was done using a scannable Teleform survey form. Subsequent to the coding of the semistructured interview, these data were combined with the paper-and-pencil demographic and practice pattern survey data.

Data Analysis

Respondent and nonrespondent physicians were compared with respect to demographic and physician practice characteristics to determine whether the respondents constitute a biased subsample of the physicians identified for recruitment. Multiple logistic regression analyses were conducted to compare respondent and nonrespondent physicians.

Two independent raters each reviewed all of the audiotaped interviews and assigned codes to the responses given by physicians to each interview question.

Eight key decision outcomes were selected prior to the analyses: (a) diagnosing depression, (b) inquiring about suicidal ideation, (c) prescribing an antidepressant, (d) prescribing an SSRI antidepressant in particular (for physicians who prescribed an SSRI, discussion of two problematic and common side effects—(e) sexual dysfunction and (f) gastrointestinal side effects), (g) counseling performed by the physician himself or herself, and (h) referring patient to external mental health care.

We conducted bivariate and multivariate analyses to examine the relationships among these study outcomes and patient and physician factors. First, we modeled the outcomes using the set of manipulated patient factors (gender, race/ethnicity, attribution, and comorbidity) that constituted the factorial design of the experiment, using a multivariable logistic regression model. The second set of analyses examined five potential physician characteristics (age, race/ethnicity, practice type, board certification, and gender) individually using univariate logistic regression analyses with the outcomes. The final set of analyses generated multivariable models by entering all significant ($p < .05$) patient and physician factors into logistic regression models, with nonsignificant factors removed in a backward-stepping process (Hosmer & Lemeshow, 1989). For the models with at least two significant variables entered in the model, an omnibus likelihood-ratio chi-square test (Harrell, 2001) was conducted to determine the joint significance of all two-way interactions between the variables in the model. If the omnibus test was significant, we examined each two-way interaction one at a time, then combined the individually significant interactions into a final multivariable model. All logistic regression models were evaluated with the Hosmer and Lemeshow (1989) goodness-of-fit tests, with c statistics ranging from .505 to .728. The magnitude of each significant effect from a logistic regression was expressed as a conditional odds ratio (OR) and 95% confidence interval (CI). This study was powered (>80%) to detect differences of at least 0.30 standard deviations between continuous variables and differences in proportions of dichotomous

variables of at least 0.15. We considered these to be the smallest statistical effects that might be relevant for clinical care and health policy discussions.

Results

Study Sample

Recruitment letters were sent out to 978 physicians. After the mailing, we were successful in contacting 942 (96%) of the physicians by phone. Of those physicians with whom we spoke, 418 (44%) were eligible and agreed to participate, 340 (36%) were ineligible (moved out of area, no longer practicing, deceased, retired, or not practicing general medicine), and 184 (20%) refused to participate. Fourteen interview records were discarded because of large amounts of missing data or significant technology problems. Thus, the final study sample was composed of 404 physicians, for a cooperation rate of 67% (404 ÷ (942 contacted – 340 ineligible)). While less than our planned sample, the final study sample size still provides greater than 80% power to detect effects of interest. Descriptive characteristics are summarized in Table 1.

Because of deliberate oversampling, our percentage of African American physicians was much higher than among the American Medical Association (AMA) membership (33% vs. 4%, $p < .0001$). Physicians participating in this study were more likely to be board certified than the national average (90% vs. 76%, $p < .0001$). Our study had slightly more women than the AMA membership (39% vs. 31%, $p = .0005$). The study sample did not have a significantly different mix of specialties than the AMA membership (48% vs. 51% family medicine, $p = .14$). Most physicians reported that the virtual patients were quite believable: 53% reported that they "strongly agree," and 37% reported that they "agree" with the statement that the depressed patient "seemed real to me" (also see Table 2).

Diagnoses

Virtually all physicians ($n = 395$, 97.8%) considered depression to be a leading diagnosis. Other diagnoses considered included hypothyroidism ($n = 219$, 54.2%), generalized anxiety disorder ($n = 80$, 19.8%), and anemia ($n = 56$, 13.9%).

Additional Information

In all, 35.9% ($n = 145$) stated that they would want to know whether the patient was having suicidal thoughts. Other additional essential information included: thyroid function tests ($n = 239$, 59.2%), other laboratory studies ($n = 240$, 59.4%), further current medical history ($n = 121$, 30.0%), past psychiatric history ($n = 141$, 34.9%), family psychiatric history ($n = 128$, 31.7%), and further depression history ($n = 104$, 25.7%).

Table 1
Physician Characteristics

Physician Characteristic	n	%
Gender		
Female	156	38.6
Male	248	61.4
Age (*M*, *SD*)	47.7	10.2
Race/ethnicity		
European American	195	48.3
African American	133	32.9
American Indian or Alaska Native	1	0.3
Asian American	50	12.4
Hispanic	6	1.5
Other	19	4.7
Specialty		
Family practice	206	51.0
Internal medicine	192	47.5
Cardiology	1	0.3
Board certified	364	90.1

Note: $N = 404$. Values are *n* and percentage unless otherwise noted.

Table 2
Selected Diagnosis and Treatment Recommendations

Diagnosis and Treatment Recommendations	n	%
Diagnosis of depression	395	97.8
Treatment recommendations		
Antidepressant (all)	347	85.9
Selective serotonin reuptake inhibitor	305	75.5
Venlafaxine	13	3.2
Bupropion	11	2.7
Trazadone	8	2.0
Tricyclic	6	1.5
Mirtazapine	4	1.0
Counseling by physician	88	21.8
Refer to mental health specialist	189	46.8
Exercise	93	23.0

Treatment Recommendations

Most physicians recommended an antidepressant ($n = 347$, 85.9%) and most of those recommended an SSRI ($n = 305$, 75.5% of all physicians). Approximately half would refer to a mental health specialist ($n = 189$, 46.8%), and most would not perform counseling themselves ($n = 88$, 21.8%).

Patient Education

Of physicians who would prescribe an antidepressant, 83.0% ($n = 287$) said they would discuss potential side effects with the patient. In addition, 201 (57.9%) said they would tell the patient to continue taking the medication even if feeling better, and 42.7% ($n = 148$) said they would mention a potential delay in therapeutic effect. Of physicians prescribing an SSRI or venlafaxine, 126 (39.6%) discussed gastrointestinal side effects and 108 (34.0%) discussed possible sexual dysfunction.

Functions of Patient Characteristics

Unadjusted relationships between patient characteristics and outcomes are shown in Table 3.

Suicidal ideation. Physicians were more likely to ask about suicidal ideation for the patients who had had an MI than they were for the patients with a psychosocial stressor (OR = 1.98, CI = 1.30 to 3.00).

Mental health referral. Physicians were more likely to recommend a mental health referral for patients who had had an MI than for patients with a psychosocial stressor (OR = 1.71, CI 1.15 to 2.54).

Patient factors were not significantly related to the physicians' diagnosis of depression, prescription of an antidepressant, provision of counseling themselves, discussion of delay in therapeutic level among physicians who prescribed an antidepressant, or discussion of gastrointestinal or sexual side effects among physicians who prescribed an SSRI antidepressant or venlafaxine.

Functions of Provider Characteristics

Unadjusted relationships between provider characteristics and outcomes are shown in Table 4.

Significant bivariate relationships were added to the multivariable models derived from patient characteristics to create the multivariable models below. Some variables that were significant in the bivariate model were not significant in the combined multivariable models. While physician's age, board certification status, and practice type appeared to affect the decision to prescribe an antidepressant, these variables were not significant when modeled in conjunction with physician race/ethnicity. Physician gender, practice type, and board certification status were significant bivariate predictors of inquiries regarding suicidal ideation but were not significant predictors when physician age and race/ethnicity and patient comorbidity type were present. Physician gender was also bivariate significant when modeling referral to a mental health professional and discussion of gastrointestinal side effects but dropped out of the model when age and other physician and patient variables were added.

Table 3

Unadjusted Relationships Between Patient Factors and Outcomes

Decision Outcomes	Gender			Race/Ethnicity			Comorbidity			Attributions		
		n	%		n	%		n	%		n	%
Diagnosis of depression (n = 395)	Male	191	99.0	White	196	97.0	Psychosocial	185	96.9	Psychological	192	98.0
	Female	204	96.7	AA	199	98.5	Medical	210	98.6	Somatic	203	97.6
Prescribe an antidepressant (n = 347)	Male	167	86.5	White	171	84.7	Psychosocial	161	84.3	Psychological	171	87.2
	Female	180	85.3	AA	176	87.1	Medical	186	87.3	Somatic	176	84.6
Inquire re: suicidal ideation (n = 145)	Male	71	36.8	White	77	38.1	Psychosocial	53	27.7*	Psychological	70	35.7
	Female	74	35.1	AA	68	33.7	Medical	92	43.2*	Somatic	75	36.1
Provide counseling himself or herself (n = 88)	Male	43	22.3	White	43	21.3	Psychosocial	40	20.9	Psychological	45	23.0
	Female	45	21.3	AA	45	22.3	Medical	48	22.5	Somatic	43	20.7
Refer to mental health specialist (n = 189)	Male	82	42.5	White	103	51.0	Psychosocial	76	39.8*	Psychological	96	49.0
	Female	107	50.7	AA	86	42.6	Medical	113	53.1*	Somatic	93	44.7
Discuss sexual side effects[a] (n = 108)	Male	59	39.1	White	55	34.6	Psychosocial	51	34.0	Psychological	51	33.3
	Female	49	29.3	AA	53	33.3	Medical	57	33.9	Somatic	57	34.5
Discuss gastrointestinal side effects[a] (n = 126)	Male	62	41.1	White	62	39.0	Psychosocial	58	38.7	Psychological	67	43.8
	Female	64	38.3	AA	64	40.3	Medical	68	40.5	Somatic	59	35.8
Discuss delay to therapeutic effect[b] (n = 148)	Male	64	38.3	White	74	43.3	Psychosocial	71	44.1	Psychological	71	41.5
	Female	84	46.7	AA	74	42.0	Medical	77	41.4	Somatic	77	43.8

Note: AA = African American.

a. Among physicians who prescribed an SSRI antidepressant or venlafaxine.

b. Among physicians who prescribed an antidepressant.

*All statistical comparisons were not significant ($p > .05$) except where marked with an asterisk.

Table 4
Unadjusted Relationships Between Physician Factors and Outcomes

Decision Outcomes	Gender (%)		Race/ Ethnicity (%)		Age (%)		Practice Type (%)		Board Certification (%)	
Diagnosis of depression (n = 395)	Male	241 (97)	White	193 (99)	<40 yrs	86 (99)	IM*	186 (97)	Yes	358 (98)
	Female	154 (99)	AA	129 (97)	40 to 49 yrs	155 (98)	FP*	203 (99)	No	37 (93)
			Other	73 (96)	50 to 59 yrs	103 (98)				
					60+ yrs	47 (94)				
Prescribe an antidepressant (n = 347)	Male	210 (85)	White*	183 (94)	<40 yrs	76 (87)	IM*	155 (81)	Yes*	324 (89)
	Female	137 (88)	AA*	103 (77)	40 to 49 yrs	140 (89)	FP*	189 (92)	No*	23 (58)
	Other*	61 (80)			50 to 59 yrs	91 (87)				
					60+ yrs	37 (74)				
Inquire re: suicidal ideation (n = 145)	Male*	76 (31)	White*	82 (42)	<40 yrs*	41 (47)	IM*	54 (28)	Yes*	138 (38)
	Female*	69 (44)	AA*	44 (33)	40 to 49 yrs*	65 (41)	FP*	87 (42)	No*	7 (18)
			Other*	19 (25)	50 to 59 yrs*	28 (27)				
					60+ yrs*	10 (20)				
Provide counseling himself or herself (n = 88)	Male	53 (21)	White	35 (18)	<40 yrs	18 (21)	IM	35 (18)	Yes	80 (22)
	Female	35 (22)	AA	33 (25)	40 to 49 yrs	41 (26)	FP	53 (26)	No	8 (20)
	Other	20 (26)			50 to 59 yrs	17 (16)				
					60+ yrs	11 (22)				
Refer to mental health specialist (n = 189)	Male*	100 (40)	White*	85 (44)	<40 yrs*	57 (66)	IM	88 (46)	Yes*	177 (49)
	Female*	89 (57)	AA*	76 (57)	40 to 49 yrs*	77 (49)	FP	98 (48)	No*	12 (30)
	Other*	28 (37)			50 to 59 yrs*	44 (42)				
					60+ yrs*	9 (18)				

(*continued*)

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Table 4 (continued)

Decision Outcomes	Gender (%)		Race/Ethnicity (%)		Age (%)		Practice Type (%)		Board Certification (%)	
Discuss sexual side effects[a] (n = 108)	Male	61 (32)	White	61 (36)	<40 yrs*	34 (47)	IM	43 (30)	Yes*	106 (36)
	Female	47 (38)	AA	25 (26)	40 to 49 yrs*	48 (38)	FP	65 (38)	No*	2 (11)
			Other	22 (41)	50 to 59 yrs*	21 (25)				
					60+ yrs*	4 (12)				
Discuss gastrointestinal side effects[a] (n = 126)	Male*	67 (35)	White	74 (44)	<40 yrs*	37 (51)	IM	63 (44)	Yes	121 (41)
	Female*	59 (47)	AA	30 (32)	40 to 49 yrs*	47 (38)	FP	62 (36)	No	5 (26)
			Other	22 (41)	50 to 59 yrs*	33 (39)				
					60+ yrs*	7 (21)				
Discuss delay to therapeutic effect[b] (n = 148)	Male	82 (39)	White	79 (43)	<40 yrs	36 (47)	IM	64 (41)	Yes	136 (42)
	Female	66 (48)	AA	40 (39)	40 to 49 yrs	59 (42)	FP	83 (44)	No	12 (52)
			Other	29 (48)	50 to 59 yrs	40 (44)				
					60+ yrs	12 (32)				

Note: AA = African American; IM = internal medicine; FP = family practice.
a. Among physicians who prescribed an SSRI antidepressant or venlafaxine.
b. Among physicians who prescribed an antidepressant.
*All statistical comparisons were not significant ($p > .05$) except where marked with an asterisk.

Table 5
Final Multivariable Models

Outcome	Model Components	Adjusted Odds Ratio
Diagnosis of depression	Board certification	4.83 (1.16, 20.15)
Prescribe an antidepressant	Board certification	5.78 (2.75, 12.15)
	Physician race/ethnicity	
	European American vs. African American	4.21 (2.02, 8.76)
	European American vs. Other	3.89 (1.68, 8.99)
Inquire about suicidal ideation	Age[a]	0.53 (0.41, 0.69)
	Comorbidity[b]	1.75 (1.13, 2.72)
	Physician race/ethnicity	
	European American vs. African American	1.82 (1.09, 3.03)
	European American vs. Other	2.37 (1.27, 4.43)
Counseling by physician	No significant relationships found	
Refer to a mental health professional	Age[a] (board certified)	1.20 (0.68, 2.12)
	Age[a] (noncertified)	0.54 (0.42, 0.71)
	Comorbidity[b]	1.64 (1.07, 2.52)
	Physician race/ethnicity	
	European American vs. African American	0.61 (0.37, 0.99)
	European American vs. Other	1.43 (0.81, 2.54)
Discuss possible sexual dysfunction[c]	Age[a]	0.56 (0.42, 0.74)
Gastrointestinal side effects[c]	Age[a]	0.73 (0.57, 0.94)
Delay in therapeutic effect[d]	No significant relationships found	

a. Indicates change associated with a 10-year interval.
b. Referent group is psychosocial stressor.
c. Among physicians who prescribed an SSRI antidepressant or venlafaxine.
d. Among physicians who prescribed an antidepressant.

Similarly, board certification did not affect discussion of sexual dysfunction once physician age was in the model.

Multivariable Models of Patient and Provider Characteristics

Final models discussed below are summarized in Table 5.

Depression diagnosis. Board-certified physicians were more likely to correctly identify depression than were non-board-certified physicians (OR = 4.83, p = .03).

Prescribing an antidepressant. Board-certified physicians were more likely to prescribe an antidepressant than were those who were not board certified (OR = 5.78, p < .0001). Significant ethnic differences were also apparent (p = .0008), with European American physicians more likely to prescribe an antidepressant than

Figure 1
Difference in Specific Outcomes by Physician Age
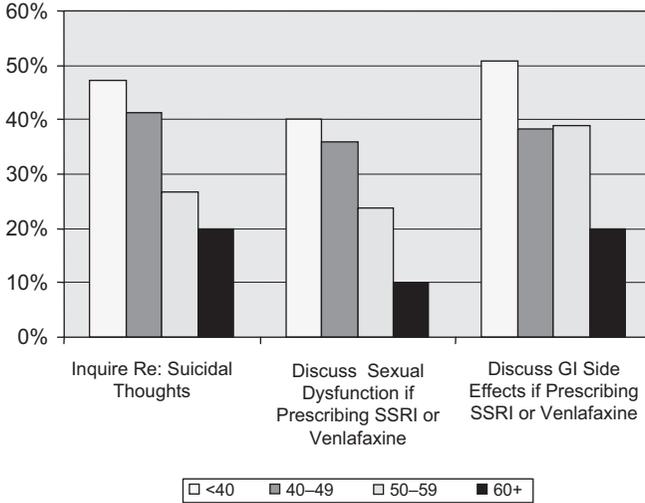
Note: Total numbers in each age group ($n = 404$): younger than 40 years ($n = 87$), 40 to 49 ($n = 158$), 50 to 59 ($n = 105$), 60 and older ($n = 50$), missing ($n = 4$).

either African American physicians (OR = 4.21) or those of ethnicities other than European American or African American (OR = 3.89).

Wanting information about suicidal ideation. This multivariable model includes two provider factors and one patient factor. Older physicians were less likely to request this information, as shown in Figure 1. Significant racial differences were apparent ($p = .0083$), with European American physicians more likely than either African American physicians or those of ethnicities other than European American or African American to want this information (ORs = 1.82 and 2.37, respectively). Finally, physicians were more likely to want this information if the patient had had an MI compared to the psychosocial stressor (OR = 1.75, $p = .126$).

Refer to a mental health professional. For board-certified physicians, younger MDs were more likely to refer patients to a mental health professional. This trend was reversed for noncertified physicians, with older physicians being more likely to refer. Significant racial differences were found ($p = .017$), with African American physicians being more likely than European American physicians to refer patients to a mental health professional (OR = 1.65) and European American physicians being

more likely to refer than physicians of other ethnicities (OR = 1.43). Patients with an MI were also more likely to be referred than those with a psychosocial stressor (OR = 1.64, *p* = .0226).

Education about sexual side effects. When prescribing an SSRI antidepressant or venlafaxine, older physicians were less likely to discuss the possibility of sexual dysfunction, as shown in Figure 1 (*p* < .0001).

Education about gastrointestinal side effects. Older physicians were less likely to discuss the possibility of gastrointestinal side effects when prescribing an SSRI antidepressant or venlafaxine, as shown in Figure 1 (*p* = .131).

No patient or physician factors were found to have a significant effect on physicians' inclination to provide counseling themselves or to discuss a delay in therapeutic effect when prescribing an antidepressant.

Discussion

Overall Findings

In summary, physicians in this study showed significant variability in diagnostic and management decisions regarding depression. Physicians' decisions for depression care were associated with physician characteristics to a greater extent than with patient characteristics. In particular, physician age was inversely correlated with a number of quality-of-care measures.

Some outcomes reflected current standard of care; for example, most stated that they would ask the patient to return within 4 weeks. Recommendations were less than optimal in a number of areas; for example, only 36.0% of the physicians stated that they would want to know if the patient was having suicidal thoughts. Our findings are comparable to those from two recent studies: a large primary care practice study, in which primary care physicians assessed for suicide in only 24.0% of depressed patients (Hepner et al., 2007), and a study using standardized patients, in which physicians assessed for suicide in only 42.0% of depressed patients (M. D. Feldman et al., 2007) . In a recent study of depressed primary care patients, 10% were at intermediate risk of self-harm (Schulberg et al., 2005). Since physician education can help prevent suicide (Mann et al., 2005), our findings underscore the importance of including education about suicide assessment in any quality improvement initiatives.

Despite the fact that sexual side effects commonly occur with SSRIs and are a common cause of discontinuation (Clayton et al., 2002; Hu et al., 2004; Meijer, Heerdink, Egberts, Leufkens, & Waldinger, 2002), only 34.0% indicated that they would educate the patient about those effects. Similarly, only 40.0% would counsel the patient about commonly experienced gastrointestinal side effects. Our findings

are consistent with one report that found that approximately half of patients and physicians report having discussions about SSRI-related side effects at some point in follow-up (Hu et al., 2004). In a study of primary care patients with chronic, recurrent depression, 62.0% of patients recalled that their physician discussed the possibility of side effects before prescribing an antidepressant. In that study, fewer than 25.0% were informed of sexual and gastrointestinal side effects (Schwenk, Evans, Laden, & Lewis, 2004). In our study, only 43.0% would inform the patient that there may be a delay to reach therapeutic effect, lower than the 69.8% rate found in a recent study using standardized patients (H. N. Young et al., 2006) and similar to that of one report which found that 44.0% of patients were given some instructions on how long to continue the antidepressant (Bull et al., 2002). Failure to inform the patient about duration of treatment has been associated with decreased adherence to treatment (Bull et al., 2002; Lin et al., 1995).

Role of Patient Factors in Physicians' Decisions

Our analyses also reveal that selected patient factors may be associated with variation in decisions. For example, physicians were more likely to inquire about suicidal ideation for the MI patient than for the patient with the psychosocial stressor. Although medically ill individuals are at increased risk for suicide, we cannot determine whether that may have affected physicians' decisions.

In general, however, we found little association between patient factors and physicians' decisions, as did two studies that used simulated patient methodology (Kales, Neighbors, Valenstein, et al., 2005; McKinlay et al., 2002). Similarly, a recent primary care practice study found no association between quality of depression care and patient race/ethnicity, age, gender, or comorbid medical conditions (Joo et al., 2005). In contrast, depression in diabetic patients was less likely to be recognized among men and among patients with perceptions of poor health (Katon, Unutzer, & Simon, 2004). The World Health Organization Collaborative Study of Psychological Disorders in General Health Care Settings (PPGHC) found that significant physical ill health was negatively associated with antidepressant prescription (Kisely, Linden, Bellantuono, Simon, & Jones, 2000). However, such practice studies are not able to control for factors such as patient presentation style and preferences.

Role of Physician Factors in Physicians' Decisions

In contrast, physician factors were found to be more important than patient factors in determining physicians' decisions. For example, physician age was inversely associated with three key quality-of-care measures: suicidal ideation, sexual side effects, and gastrointestinal side effects. This finding is consistent with the findings of a systematic review of the relationship between clinical experience and quality of health care (Choudhry, Fletcher, & Soumerai, 2005). That analysis found that in

most studies decreasing performance was associated with greater years of practice. There are limited data in mental health. In the PPGHC study, general practitioners who had a postgraduate qualification in psychiatry were more likely to prescribe antidepressants (Kisely et al., 2000). In a study of psychiatrists using vignettes, increased number of years in practice was associated with decreased likelihood of correctly diagnosing depression (Epstein et al., 2001). Another group, using videotapes to study physicians' assessments of geriatric depression, found that younger physicians were more likely to diagnose depression in younger patients and in men (McKinlay et al., 2002). In a recent study using standardized patients, older physicians provided significantly less information to patients about antidepressant prescriptions (Schwenk et al., 2004). Findings related to physician age may be explained by factors including distance from training and inadequate continuing medical education. Continuing medical education in depression treatment is not required for primary care physicians. Many physicians may be educated only by pharmaceutical representatives who may tend to emphasize efficacy over side effects. In addition, the importance of inquiring about suicidal ideation for all patients diagnosed with depression is taught to trainees and in continuing medical education programs but not by industry representatives.

We also found that European American physicians were more likely than physicians of other ethnicities to want information about suicidal ideation and to prescribe antidepressants. African American physicians were more likely than European American physicians to refer patients to a mental health professional, while European American physicians were more likely to refer than physicians of other ethnicities. There are limited data on ethnic differences in practice, and studies do not generally control for variations in patient presentation and practice structure (e.g., form of insurance reimbursement). One study of physician responses to videotapes of depression found that European American physicians were much more likely to diagnose depression than were African American physicians (McKinlay et al., 2002). In our study, ethnic differences may have been reflective of relative level of comfort in treating depression. Thus, a physician who is comfortable treating depression might be more likely to prescribe an antidepressant and less likely to refer. Confidence in treating depression could be related to cultural factors or to unmeasured characteristics such as site of medical school. In a recent vignette study of primary care physicians and psychiatrists, international medical graduates were less likely than U.S. medical graduates to correctly diagnose depression and recommend a newer antidepressant (Kales et al., 2006). In that study, physician race/ethnicity and medical school location were highly correlated.

In our study, board-certified physicians were more likely to correctly diagnose depression and to prescribe an antidepressant. This finding is consistent with that from a vignette study in which board-certified psychiatrists were more likely to correctly diagnose major depression (Epstein et al., 2001). Research on the relationship between board certification and clinical outcome measures has mixed findings, but

it appears that board certification is associated with higher quality of care (Brennan et al., 2004).

Limitations of the study include the fact that the patient presentations were depicted via interactive CD-ROM methodology and not with standardized live patients (Badger et al., 1994; Kravitz et al., 2006). Nonetheless, participants found the presentations to be highly realistic. Our approach has the following advantages over unannounced standardized patients: tight experimental control of patient presentations (i.e., no variation in patient presentations, which can occur when standardized live patients interact with a physician) and the ability to obtain rich information about provider decisions with an extended semistructured interview. In addition, since physicians may detect unannounced standardized patients, the approach does not ensure validity. Our approach is comparable to that of videotaped presentations of patients. Physicians' ability to speak directly to the CD-ROM patients may have led to increased realism compared to videotapes, but we are not aware of definitive research supporting that possibility. While the validity of the findings as reflective of actual performance in practice is supported by the fact that rates of decisions in this study are generally comparable to those found in practice, the study has not generated information that can be used to estimate actual rates of physician performance of various decisions (e.g., prescribing rates). Nonetheless, it does provide information regarding physician competence, as do medical board and recertification examinations. A further limitation is that all physicians were from the Washington, D.C., and Baltimore area. On the other hand, our sampling strategy may have provided a more randomized sample than other survey strategies (e.g., national meeting recruitment; Kales, Neighbors, Valenstein, et al., 2005; Schulman et al., 1999). Although we designed the study to include an examination of whether physician specialty was associated with physicians' decisions, structural factors that may influence behavior (e.g., organizational structure) were not analyzed in our study (McKinlay et al., 2006; Pham, Schrag, Hargraves, & Bach, 2005). Finally, one third of eligible participants did not participate.

The successful implementation of this study supports the use of structured simulated patient methodology as a rigorous means to assess physician behavior. Additional research utilizing a similar methodology could be expanded to additional physician groups (e.g., in other locations or other specialties such as psychiatrists) and assess physicians' decisions for additional psychiatric problems (e.g., anxiety or substance use disorders). Our findings imply that certain physicians (e.g., older practitioners) may benefit from enhanced continuing medical education and quality improvement initiatives to improve the treatment of depression by the primary care physician. In addition, some primary care physicians may benefit from enhanced collaboration with mental health providers in evidence-based collaborative care models (Gilbody, Bower, Fletcher, Richards, & Sutton, 2006; Katon & Unutzer, 2006). Thus, selected physicians might be targeted to participate in such models, based on performance on quality measures such as those measured in our study. It is

also possible that pay-for-performance programs could incentivize physicians to improve care for depression.

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