

Patient Race/Ethnicity and Quality of Patient–Physician Communication During Medical Visits

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The existence of racial/ethnic health disparities in health care in the United States is largely undisputed.¹ However, the mechanisms through which race/ethnicity contribute to these disparities are complex and are often obscure.² The Institute of Medicine report *Unequal Treatment*³ confirmed that racial/ethnic disparities in health care are not entirely explained by differences in access to care, clinical appropriateness, or patient preferences. Studies have documented differential receipt of technical aspects of care, such as tests, therapies, and procedures, among racial/ethnic minorities compared with Whites, even after control for insurance status and access to a regular primary care provider.^{2,3} Access to appropriate treatments and screening tests is less than optimal among all patients who navigate the complex US health system⁴; however, such deficits are magnified among racial/ethnic minorities.^{1,2,5,6}

Access to and receipt of appropriate diagnostic, preventive, and therapeutic services and modalities are not the only measures of health care quality. A 1999 report by the Institute of Medicine⁷ included patient-centered care prominently among indicators of health care quality. One indicator of patient-centered care—patient–physician communication—has been postulated as a mechanism for racial/ethnic health disparities.³ It has been associated with patients' perceptions of finding common ground with their physicians⁸ and with better health outcomes.^{9–11}

Racial/ethnic minorities rate the quality of interpersonal care by physicians and within the health care system in general more negatively than Whites.^{5,12–20} However, research that uses objective measures of patient–physician interactions, rather than patient reports, is lacking. We conducted a study in which patient–physician communication during primary care visits of African American and White patients was directly observed. We hypothesized that African American patients

Objectives. We examined the association between patient race/ethnicity and patient–physician communication during medical visits.

Methods. We used audiotape and questionnaire data collected in 1998 and 2002 to determine whether the quality of medical-visit communication differs among African American versus White patients. We analyzed data from 458 African American and White patients who visited 61 physicians in the Baltimore, Md–Washington, DC–Northern Virginia metropolitan area. Outcome measures that assessed the communication process, patient-centeredness, and emotional tone (affect) of the medical visit were derived from audiotapes coded by independent raters.

Results. Physicians were 23% more verbally dominant and engaged in 33% less patient-centered communication with African American patients than with White patients. Furthermore, both African American patients and their physicians exhibited lower levels of positive affect than White patients and their physicians did.

Conclusions. Patient–physician communication during medical visits differs among African American versus White patients. Interventions that increase physicians' patient-centeredness and awareness of affective cues with African American patients and that activate African American patients to participate in their health care are important strategies for addressing racial/ethnic disparities in health care. (*Am J Public Health.* 2004;94:2084–2090)

would experience poorer-quality medical-visit communication than White patients.

METHODS

Study Design and Population

We compiled data from 2 brief cohort studies conducted between July 1998 and June 1999 and between January 2002 and November 2002. Data collection for the 1998 study has been described in detail elsewhere.²¹ The study procedures were reviewed and approved by the institutional review board of the Johns Hopkins Medical Institutions. Physicians were recruited from group practices and from federally qualified health centers that served both managed care and fee-for-service patients in the Baltimore, Md/Washington, DC/Northern Virginia metropolitan area. After meetings with practice leaders, physicians who delivered primary care to patients at least 30 hours per week were invited to participate in the studies via letters and follow-up telephone calls. Both studies attempted to target practices that had a high percentage of African American physi-

cians and patients. Hispanic and Asian physicians were not included in the 1998 study, which focused specifically on issues of patient–physician race concordance and communication, but they were included in the 2002 study, which examined the association between race/ethnicity and patient–physician communication in broader terms.

Patient recruitment took place over an average of 1 to 2 days for each physician. Research assistants attempted to approach all patients during each recruitment day, with a target of 10 patient participants per physician. Patients were eligible to participate if they (1) were aged 18 years or older, (2) were seeing their physician on the recruitment days, and (3) self-identified their race/ethnicity as White or African American. When patients appeared or reported themselves to be too acutely ill or cognitively impaired to participate in the interview, they were not recruited.

Data Collection

Patients and physicians provided informed consent and were told that the goal of each

study was to learn more about how doctors and patients communicate with one another. Patients in both cohorts completed a 5-minute survey that included questions about health status and demographics. Research assistants set up a tape recorder in the physician's office, started the recording, and left the room; physicians and patients were instructed that they could turn off the tape recorder or pause the recording at any time during the visit. Physicians in both studies completed a background questionnaire about their demographics and a post-visit questionnaire that included a question about how well the physician knew a given patient.

Audiotaped medical visits were coded with the Roter Interaction Analysis System (RIAS), a widely used coding system for medical encounters that has documented reliability and predictive validity.^{22–24} The RIAS provides a framework for understanding the communication dynamics between patients and physicians during a medical visit. The 37 exhaustive and mutually exclusive RIAS categories capture a complete thought that is expressed by either the patient or the physician (referred to as an *utterance* or *unit of talk*). These categories group elements of exchange that reflect socioemotional communication (i.e., positive, negative, emotional, partnership building, and social exchanges) and task-focused communication (i.e., asking questions, giving instruction and direction, and giving information).²⁵ In this way, the system captures 4 primary functions of the medical visit: data gathering, patient education and counseling, responding to patient emotions, and partnership building.²² In addition to the categorization of verbal communication, coders are asked to rate the global affect (emotional context) of the patient and the physician on each audiotape across several dimensions on a numeric scale of 1 (low/none) to 6 (high).

The same 2 experienced RIAS coders were responsible for coding all medical-visit data collected between 1998 and 1999 and during 2002. The coders, both of whom were White women, were not told the race/ethnicity of patients or physicians, but they may have made assumptions about race/ethnicity and other characteristics on the basis of auditory cues. In all cases, they were unaware of the study hypotheses and did not have access to

questionnaire data or demographics about patients or physicians.

Reliability for the RIAS coding was assessed separately for the 2 studies. Inter-coder reliability for talk categories and percent agreement for affect ratings in the 2002 study were similar to those for the 1998/99 study.²¹ The overall average intercoder reliability across all categories was 0.88 for physician talk (range=0.32–1.00) and 0.79 for patient talk (range=0.06–1.00). Only communication categories that occurred at low frequencies (i.e., with an average of <1 statement per visit) had reliability coefficients that fell below 0.70. Coder agreement within 1 point on each dimension of patient and physician positive affect (9 dimensions for patients and 8 for physicians) ranged from 78% to 100%.

Measures of Communication

Patient–physician communication during medical visits was the main study outcome and was assessed with measures derived from analysis of RIAS-coded audiotape data. We evaluated 3 aspects of the medical visit (measures are listed in parentheses): (1) overall process (duration of visit and average speech speed), (2) patient-centered orientation (physician verbal dominance and physician patient-centeredness scores), and (3) overall emotional tone (patient and physician positive-affect scores).

Visit duration was the amount of time in minutes that transpired from the start of the medical visit until its conclusion. *Speech speed* reflected the average number of complete statements expressed per minute and was calculated by dividing the total number of patient and physician statements by the duration of the medical visit in minutes.

The *physician verbal dominance* score was calculated by dividing the total number of physician statements by the total number of patient statements.^{23,24} A value greater than 1 denoted relatively more physician than patient talk, while a value less than 1 denoted relatively more patient than physician talk. The *physician patient-centeredness* score was calculated by dividing the total amount of socioemotional talk and questions asked by the patient by all the biomedical elements of talk during the course of a medical visit. Socioemotional talk included all partnership-

building, emotional, and psychosocial elements of exchange (i.e., physician open-ended questions and psychosocial information and counseling and relationship building, positive talk, negative talk, and social talk by physicians and patients), while biomedical talk reflected the task-oriented elements of the exchange (i.e., physician and patient talk aimed at conveying biomedical information and counseling, statements of orientation, and physician closed-ended questions).^{24,26}

Positive-affect scale scores were calculated by summing coders' ratings for patients and physicians (separately) on several dimensions. The *patient positive-affect score* was the sum of coders' ratings of dominance/assertiveness, interest/attentiveness, friendliness/warmth, responsiveness/engagement, and sympathy/empathy exhibited by the patient during the visit. The *physician positive-affect score* was the sum of coders' ratings of interest/attentiveness, friendliness/warmth, responsiveness/engagement, and sympathy/empathy exhibited by the physician during each medical visit and the degree to which the physician sounded hurried or rushed was subtracted. Interitem reliability (Cronbach α) for both scales was high (patient positive affect α =0.83; physician positive affect α =0.91).

Patient and Physician Characteristics

The independent variable in our study was patient race/ethnicity. While patients self-identified as a member of 1 of 6 racial/ethnic groups (Asian, Latino/Latin American or Hispanic, Native American/American Indian or Indigenous People, Pacific Islander, Black/African American, and White), there were insufficient numbers of patients who identified themselves as anything other than White or Black/African American for meaningful statistical analysis, and those patients were excluded from the final sample (n=21). Several demographic characteristics of both patients and their physicians were identified for inclusion as possible covariates in multivariate analyses. Patient characteristics included age, gender, educational attainment, self-rated health status (a 1-item question adapted from the Medical Outcomes Study Short-Form),²⁷ and whether the patient was part of the 1998 or the 2002 cohort. Physician characteristics included age, gender, race/ethnicity, medical

specialty, location of medical school training (US vs international), time since completing postgraduate training (i.e., residency training and fellowship training, if applicable), reported exposure to communication skills training, and the physician's appraisal of how well he or she knew a patient.

Statistical Analysis

We performed exploratory analyses that associated all covariates with outcome variables. We then performed univariate and multivariate linear regressions to determine the degree to which patient race/ethnicity was associated with medical-visit communication. To identify potential confounders, we performed descriptive analyses with χ^2 tests for categorical variables and with analyses of variance for continuous variables to associate all patient and physician characteristics with patient race/ethnicity; univariate linear regression analyses were performed to associate all characteristics with outcome measures. Patient and physician characteristics were included in the multivariate models if they were statistically significantly associated with patient race/ethnicity and at least 1 of the outcome measures or if there was substantial evidence from the existing literature that these factors were potential confounders of the relationships under investigation.

We used the generalized estimating equation method for correlated data²⁸ in all regression analyses to account for nonindependence across observations, because the same physician was involved in several patients' audiotaped medical visits. An exchangeable correlation structure was assumed with strongly consistent estimation, which was likely to yield more accurate or valid coefficient estimates, even if the correct correlation structure was specified incorrectly.²⁹ There were 29 sites that had an average of only 2 physicians per site, and some physicians practiced at more than 1 site. Therefore, analyses were designed to account for intraclass correlation within physicians but not within sites. We present 1 multivariate model that included both physician and patient demographic characteristics as covariates, because models in which these characteristics were entered in separate blocks yielded similar results.

RESULTS

Recruitment and Sample Characteristics

Of the 132 physicians invited to participate in the 1998 and 2002 studies, 63 (48%) agreed to do so. Two physicians (3%) were dropped from the study because of scheduling and patient recruitment difficulties. Data were collected for 30 White, 21 African American, 9 Asian or Indian American, and 1 other race/ethnicity physicians (n=61).

Seven hundred and eighty-nine patients were approached in physician waiting rooms, 22 (3%) of whom were ineligible. Of the 767 eligible patients, 197 (26%) declined participation or were too ill to complete the survey. Of the 570 (74%) patients who were eligible and who were willing to participate, 70 (12%) had inadequate or missing audiotape data, 21 (4%) were missing data for 1 or more questionnaires, and 21 (4%) reported their race/ethnicity to be other than African American or White and thus were excluded from analyses (n=112).

Data for 458 patients who were seen by 1 of 61 physicians recruited during the 1998 (n=252 patients, n=31 physicians) and 2002 (n=206 patients, n=30 physicians) studies were included in our analyses (Table 1). The mean age of patients was approximately 50 years. The mean educational attainment was roughly equivalent to receiving a high school diploma. Two thirds of study patients were female; two thirds reported their health status as good, very good, or excellent; more than one third visited male physicians; half visited White physicians; 72% visited internists; 78% visited US medical graduates; and half visited physicians who reported having some communication skills training. On average, patients visited physicians who had finished training more than 9 years before the study period.

There were statistically significant differences between the White and African American patients. Compared with White patients, African American patients were younger, more likely to be seen by female and family physicians, and less likely to see physicians of their same race/ethnicity. African American patients also were more likely to be seen by physicians who had less experience (i.e.,

fewer years since completing training) (Table 1).

Quality of Medical-Visit Communication

Table 2 shows the results, associating patient race/ethnicity with measures of medical-visit communication (visit duration and speech speed), patient-centered orientation (physician verbal dominance and patient-centeredness scores), and emotional tone (physician and patient positive-affect scores).

Communication process. There were no statistically significant differences in duration or speech speed when medical visits of African American and White patients were compared.

Patient-centered orientation. Physicians were more verbally dominant with African American than with White patients; they talked 43% (95% confidence interval [CI]=34, 53) more than African American patients and only 24% (95% CI=16, 32) more than White patients. Similarly, physicians' medical visits with African American patients were less patient-centered than their visits with White patients (1.02 [95% CI=0.89, 1.14] for African Americans vs 1.31 [95% CI=1.02, 1.60] for Whites). Racial/ethnic differences in physician verbal dominance remained statistically significant after we controlled for patient and physician demographic characteristics and how well the physician knew the patient (1.73 [95% CI=1.20, 2.26] for African American patients vs 1.50 [95% CI=0.98, 2.01] for White patients). Racial/ethnic differences in the patient-centeredness of medical visits showed the same pattern in both adjusted and unadjusted analyses (patient-centeredness score=1.91 [95% CI=0.76, 3.07] for White patients vs 1.58 [95% CI=0.68, 2.48] for African American patients) but were not statistically significant ($P=.08$) after adjustment for demographic characteristics.

Emotional tone. In the univariate analyses, coders' average ratings of positive affect for African American patients were lower than those for White patients (16.50 [95% CI=16.09, 16.92] vs 17.59 [95% CI=17.23, 17.96], respectively). Similarly, coders rated physicians' affective tone as less positive during medical visits with African American patients than with White patients (11.90 [95% CI=11.26, 12.55] vs 12.68 [95%

TABLE 1—Patient and Physician Demographics by Patient Race/Ethnicity: Baltimore, Md–Washington, DC–Northern Virginia Metropolitan Area, July 1998–June 1999 and January–November 2000

	Total (N = 458) ^a	White Patients (n = 202) ^a	African American Patients (n = 256) ^a	<i>P</i> ^b
Time of medical visit and questionnaire completion				
1998 cohort (%)	252 (55)	110 (54)	142 (55)	
2002 cohort (%)	206 (45)	92 (46)	114 (45)	.83
Patients				
Mean age (SD)	49.26 (16.53)	53.03 (17.77)	46.56 (15.04)	<.01
Gender (%)				
Male	152 (33)	72 (36)	80 (31)	.32
Female	306 (67)	130 (64)	176 (69)	
Mean years of education (SD)	12.39 (2.62)	12.61 (2.79)	12.22 (2.47)	.11
Self-rated health status (%)				
Poor/fair	138 (30)	52 (26)	86 (34)	.16
Good	180 (39)	87 (43)	93 (36)	
Very good/excellent	138 (30)	62 (31)	76 (30)	
How well physician knows patient (%)				
Very well	167 (44)	83 (46)	84 (41)	.57
Somewhat	144 (38)	63 (35)	81 (40)	
Not at all (new patient)	72 (19)	33 (18)	39 (19)	
Physicians				
Gender (%)				
Male	176 (38)	94 (47)	82 (32)	<.01
Female	282 (62)	108 (53)	174 (68)	
Race/ethnicity (%)				
White	234 (51)	141 (70)	93 (36)	<.01
African American	157 (34)	35 (17)	122 (48)	
Asian	63 (14)	26 (13)	37 (14)	
Other	4 (1)	0 (0)	4 (2)	
Specialty (%)				
Internal medicine	313 (72)	153 (78)	160 (66)	<.01
Family practice	124 (28)	42 (22)	82 (34)	
Location of medical training (%)				
United States	310 (78)	142 (83)	168 (75)	.07
International	86 (22)	30 (17)	56 (25)	
Has had communication skills training				
Yes	230 (53)	103 (53)	127 (52)	.94
No	207 (47)	92 (47)	115 (48)	
Mean (SD) time since completed training (y)	9.5 (8.1)	11.21 (8.27)	8.48 (6.76)	<.01

^aThe sample sizes reflect the total number of patient participants. The actual sample size was lower for certain characteristics because of patient nonresponse (patient age, educational attainment, and self-rated health status) and physician nonresponse (previous communication skills training, time since completing training, location of medical school training, and self-rated appraisal of how well physician knows a patient).

^bDifferences across patient groups were analyzed with χ^2 statistics for categorical variables and with analysis of variance for continuous variables. Some numbers may not add up to the total number owing to missing data for certain variables.

respectively), and the overall positive affect of physicians was rated lower when they were with African American patients than when they were with White patients (13.19 [95% CI= 10.56, 15.82] vs 14.12 [95% CI= 11.48, 16.75], respectively).

DISCUSSION

Our study showed objective differences in the quality of physician–patient communication among African American and White patients that mirror previously documented differences in patients’ perceptions of their quality of health care.^{5,12–20} Physicians were more verbally dominant and tended to be less patient centered in their approach with African American patients than with White patients. Previous studies have shown that both verbal dominance and patient centeredness are sensitive markers of interaction dynamics; patient-centered visits are more consistently marked by active patient participation in the medical dialogue and by less physician verbal dominance.^{23,30} Our study suggests that patient engagement and participation, rather than overall time spent, during medical visits may be contributing to health disparities. Current concerns about the ever-increasing time pressure on physicians make this our finding particularly relevant.³¹

Our finding that visits with African American patients showed less positive affect—on the part of both patients and physicians—than visits with White patients provides some insight into the subtle nature of emotional reciprocity. Affect is conveyed primarily through voice tone and can be considered the unspoken subtext of the medical dialogue.³² A 2002 study in the Netherlands similarly reported lower levels of positive affect among both patients and physicians during the visits of racial/ethnic minority patients compared with the visits of native-born Dutch patients.³³

Patient-centered communication, including greater patient input into the medical dialogue, has been associated with better patient recall of information, treatment adherence, satisfaction with care, and health outcomes.^{11,23,25} While less is known about the association between medical-visit affective tone and health outcomes, there is evidence that global affect ratings are a reliable indica-

CI= 11.91, 13.45], respectively). Even after we controlled for demographic characteristics, the overall positive affect of African

American patients was rated lower than that of White patients (15.77 [95% CI= 13.47, 18.06] vs 16.65 [95% CI= 14.31, 18.99],

TABLE 2—Association Between Patient Race/Ethnicity and Medical-Visit Communication Quality: Baltimore, Md–Washington, DC–Northern Virginia Metropolitan Area, July 1998–June 1999 and January–November 2000

	White Patients (n = 202) ^a Mean (95% CI)	African American Patients (n = 256) ^a Mean (95% CI)	<i>P</i> ^b
Medical-visit communication process measures			
Duration of visit, minutes			
Univariate model	15.91 (14.36, 17.47)	15.27 (13.84, 16.71)	.46
Multivariate model ^c	9.64 (2.01, 17.28)	9.01 (1.97, 16.05)	.59
Speech speed ^d			
Univariate model	23.22 (22.17, 24.28)	22.81 (12.71, 23.90)	.38
Multivariate model ^c	19.91 (14.96, 24.86)	19.90 (15.08, 24.72)	.98
Measures of patient-centered communication			
Physician verbal dominance ^e			
Univariate model	1.24 (1.16, 1.32)	1.43 (1.34, 1.53)	<.001
Multivariate model ^c	1.50 (0.98, 2.01)	1.73 (1.20, 2.26)	<.001
Physician patient-centeredness ^f			
Univariate model	1.31 (1.02, 1.60)	1.02 (0.89, 1.14)	<.05
Multivariate model ^c	1.91 (0.76, 3.07)	1.58 (0.68, 2.48)	.08
Measures of medical-visit affective tone			
Patient positive-affect score			
Univariate model	17.59 (17.23, 17.96)	16.50 (16.09, 16.92)	<.001
Multivariate model ^c	16.65 (14.31, 18.99)	15.77 (13.47, 18.06)	<.001
Physician positive-affect score			
Univariate model	12.68 (11.91, 13.45)	11.90 (11.26, 12.55)	.02
Multivariate model ^c	14.12 (11.48, 16.75)	13.19 (10.56, 15.82)	.02

Note. CI = confidence interval.

^aThe sample sizes reflect the number of observations included in most univariate analyses (to within 1%). Multivariate analyses included approximately 28% fewer cases than univariate analyses.

^bDerived from generalized estimating equations.

^cThe multivariate model included patient demographics (age, gender, years of education, and self-rated health status) and physician demographics (gender, race, time since completing training, and self-rated appraisal of how well physician knows a patient) as covariates.

^dSpeech speed was computed by summing the total number of patient and physician utterances and dividing by the length of the visit in minutes.

^eVerbal dominance score was a ratio of amount of physician talk to amount of patient talk.

^fPatient-centered interviewing score was a ratio of amount of psychosocial and socioemotional talk to amount of biomedical talk.

tor of the emotional context of the medical visit. Furthermore, these ratings are associated with patient satisfaction and return visits.³² Positive affective evaluations of physician behavior also have been associated with mutual liking³³ between the physician and the patient and with a lower likelihood that a patient would consider changing physicians over a 1-year period.³⁴

There are some potential limitations to our study. First, the generalizability of the physician and patient populations may be limited. Approximately 50% of the recruited physicians participated, and these physicians may

be different from their peers in important ways. Compared with a statewide sample of primary care physicians in Maryland (in which minorities were oversampled), the physicians in our study were similar with regard to practice settings but were younger, had fewer years in clinical practice, were somewhat more likely to be trained in the United States, and were more likely to be women.³⁵ The second potential limitation is that only patients who were willing to complete questionnaires and have their medical visit audiotaped participated in the study. Although research assistants attempted to recruit all

patients who presented for care from participating physicians on recruitment days, different information might have been obtained if all the patients of a practice had been enrolled. To the extent that findings from our research are consistent with other work that has associated patient race/ethnicity with measures of health care quality, our confidence that the findings reflect truly observed phenomena was increased. Furthermore, insofar as one might expect patients and physicians who are willing to participate in this type of research to be more interested in communication issues or to be more likely to have had positive experiences with the health care system in the past, it is possible that disparities evident under “best scenario” conditions would be even greater among the general population of patients and physicians.

The third potential limitation is that it is possible that confounding by demographic characteristics of physicians (i.e., specialty), patients (i.e., reason for visit), or audiotape coders (i.e., race/ethnicity) could account for our findings. Although African American patients in our sample were more likely than White patients to see family physicians, physician specialty was not related to any of the communication outcomes. One recent study showed that family physicians were more patient-centered with minority patients than general internists were; however, a bias based on specialty in our sample would act to diminish the observed difference between African American and White patients rather than enhance it.³⁶ We did not collect information about the reason for each medical visit; however, we did control for patients' self-reported health status, which likely minimized any communication differences associated with the reason for medical visits. Finally, audiotape coders' interpretation of auditory cues may have introduced systematic bias into affect ratings or categorization of communication content. Both coders were White women who may not have been sensitive to cultural differences in expressions of positive affect by the racial/ethnic minority patients or the physicians. The demonstrated interrater reliability in our study—and across studies that have used the RIAS—and the fact that the coders were not aware of the study hypotheses minimizes the likelihood of such bias.

Our study is among the few^{23,37} that have assessed the association of patient race/ethnicity with the empirical measures of communication during medical visits in primary care practices. Our findings show that racial/ethnic differences are evident within communication domains that have been associated with clinical outcomes in previous studies. Therefore, racial/ethnic differences in these processes of care may contribute to disparities in health. However, this question will be better addressed when researchers can better quantify the effect of medical-visit communication differentials on clinical outcomes among racial/ethnic minority and White patient populations.

Our study also demonstrates the need for further examination of the mechanisms through which race/ethnicity has an impact on communication during medical visits. For example, future research should identify important similarities between physicians and patients on the basis of the social and personal meaning attributed to race/ethnicity. Such research should employ novel methods for evaluating the role of physician bias and should include measures of patient expectations, beliefs, and preferred roles. Future research also should include assessments of nationally representative samples of patients and physicians and should be expanded to include adequate numbers of Hispanic, Asian, and other racial/ethnic minority patients and physicians.

Our study also has implications for the education and training of health care professionals and the interventions targeted at patients. Along with previous studies, our findings show that communication skills programs for medical students, residents, and practicing physicians that focus on patient-centeredness and affective dimensions of care (i.e., building rapport) will benefit patients in general and racial/ethnic minority patients in particular. We have built on previous research that has associated patient activation with improved health outcomes,¹¹ and our work suggests that empowering African American patients through interventions that build confidence and competence for active participation in health care may be an important strategy for overcoming racial/ethnic disparities in health care and, subsequently, in health status. ■

About the Authors

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Contributors

The study was originated and designed by R.L. Johnson and L.A. Cooper, with substantial input from D. Roter and N.R. Powe. R.L. Johnson performed the analyses described, and prepared the article. L.A. Cooper obtained the funding and served as the principal investigator for both studies that provided data for analysis. All authors contributed substantially to editing the article.

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Human Participant Protection

The research protocols for both the 1998 and 2002 studies included in these analyses were reviewed and approved by the institutional review board of the Johns Hopkins Medical Institutions. The protocol for the secondary data analysis presented in this article was reviewed and approved separately by the committee for human research of the Johns Hopkins Bloomberg School of Public Health.

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