A 41-Year-Old African American Man With Poorly Controlled Hypertension
Review of Patient and Physician Factors Related to Hypertension Treatment Adherence

Lisa A. Cooper, MD, MPH, Discussant

CASE PRESENTATION

Dr Delbanco: Mr R is a 41-year-old African American man with a long history of hypertension, first discovered in the early 1990s. Over the years, Mr R has had difficulty adhering to suggested medication regimens and his blood pressure has been poorly controlled, despite the efforts of multiple physicians at a number of different institutions.

With blood pressures as high as 240/180 mm Hg in the past, Mr R’s medical history is remarkable for episodes of epistaxis, headache, and occasional palpitations. Hospitalized for accelerating hypertension in 1994, he has been troubled over the years by adverse effects from a number of medications. Hydrochlorothiazide interfered with his sexual function, and β-blockers made him feel “sluggish mentally.” He tried acupuncture but found it unhelpful.

A self-employed businessman, Mr R has commercial health insurance that partially covers the costs of his medications. He works long and irregular hours. He is a single father with 2 children, one of whom lives with him. He has never smoked and uses little alcohol. The CAGE questionnaire, a screening test for alcohol abuse, was performed and was negative. He is physically fit and exercises intermittently. His mother has hypertension but his siblings do not.

On recent physical examination, Mr R looked well. His blood pressure was 146/74 mm Hg in the right arm and 144/72 mm Hg in the left arm. His pulse was 64/min and regular; respirations, 10/min. He weighed 210 lb, and his height was 72 in. His eye grounds were unremarkable, lungs clear, veins flat. Carotid arteries demonstrated normal pulsations and no bruits were heard. Cardiac examination revealed a grade 2/6 holosystolic murmur at the base, accentuated with a Valsalva maneuver. There was no heave, rub, or gallop. Abdominal examination revealed no organomegaly, bruits, or hepatomegalic reflux. He exhibited no peripheral edema or neurological abnormalities.

Results of complete blood cell count and serum tests for electrolytes, creatinine, urea nitrogen, and random glucose were normal. Urinalysis and prostate-specific antigen results were normal. A fasting, calculated low-density lipoprotein level was 104 mg/dL (2.69 mmol/L). An electrocardiogram revealed voltage criteria and ST-T changes compatible with left ventricular hypertrophy. A chest film revealed mild cardiomegaly, with...
left ventricular predominance, as well as a tortuous or dilated ascending aorta, for which further evaluation was scheduled.

Mr R was prescribed lisinopril, 10 mg once daily, and nifedipine, 90 mg extended-release, once daily, by his physician. His level of adherence to these medications is unknown.

Mr R: My boss noticed blood dripping on the paperwork, and he said, “Go to the hospital.” So I went to the emergency department. This was the early '90s, and I don’t think there was a lot known about blood pressure at that time. The doctor gave me some medication and sent me back to work. I pretty much ignored the problem from there.

I know that high blood pressure is a silent killer. You really don’t feel the effects—I didn’t. I think my body has adjusted to it. There are times when I have come into the hospital and I’ve felt very good, but my blood pressure was off the scale. To a certain degree, it scares me that I can feel good walking around. I feel pretty strong, but I’m like a walking time bomb. So I guess, in a sense, I’ve developed a proclivity for self-delusion when it comes to high blood pressure. I don’t look at it as a disease. When I think about a disease, I think about cancer or HIV, those types of things that you can readily see and feel. High blood pressure: you don’t see it; you don’t feel it.

The problems that I had early on with the treatments were that they seemed to be inconsistent. I believe, back in ’98-99, within a 1-year period, I must have been given at least 30 different types of medications.

I was referred to an acupuncturist, who told me that sooner or later, all the medications that I have been taking are going to have an adverse effect on my health. So that put me in a stymie: “Do I believe this doctor, or that doctor? Are they giving me medication? Is it just to throw them at me, hoping for a cure?”

You ask yourself, “Why are you taking the medication?” So you kind of slack off. You don’t feel well. You go back to the doctor and say, “I’m not feeling well.” He gives you another bunch of medication. You take that. So it’s an ongoing problem. You’re always constantly searching for answers, but you don’t know where to find them, necessarily.

I don’t eat right. I don’t cook. I don’t know how to cook. I don’t plan on learning how to cook. I like McDonald’s, Burger King, Wendy’s, you name it. So I know I have to eat better. And I’ve been trying. I know I have to exercise, and I don’t have a problem with that.

I have not checked my own blood pressure. I bought the kit, and I find it difficult to monitor it. I don’t think I read it correctly. And I don’t think the electronic models they sell in stores work properly. I used to go into the little blood pressure booth in CVS, and I always got an error. That made me nervous, because a person went right after me, and the blood pressure machine worked just fine for them. So I don’t do that any more.

As far as a racial guideline, in regards to how a doctor looks at a patient of another race, I’ve never been treated unfairly or differently. I guess the confusing part is that I see people as being the same. So, when you say one disease is more prevalent in an African American than in a Caucasian American, I get confused. I’m always saying to myself, “Why? We are all supposed to be the same inside and outside.”

DR W: HIS VIEW

I’ve tried to get an idea of how my patient looks at his blood pressure, and it’s somewhat difficult to say. He’s a very smart man. He certainly has good insight into a lot of parts of his life, and he knows he needs to take medication on a regular basis. But when he comes into the office, frequently he’ll have gone through a long period of time when he has not taken his blood pressure or has not been seen by a physician. And he can do this for many months. He often has side effects, and that is a primary concern, but I often do wonder if there’s something else that either he hasn’t told me or that I’m not understanding.

There was a period when my patient went a year without seeing me. I really would love to see a system where the pharmacy let me know that he was not filling his medications. I would love to have a nurse or someone else who could call him to tell him it has been more than 3 months since his last visit.

I think it is more difficult to manage someone from a different culture. They may have different values. They certainly have different ways of interpreting medications. Being Jewish—and there’s a long line of Jewish doctors in my family—we tend to listen to a doctor and take what they say more word for word. We’re more likely to go to a doctor, more likely to take what medications we’re given. So in a lot of ways, it is much more difficult.

AT THE CROSSROADS: QUESTIONS FOR DR COOPER

What are the epidemiology and effects of hypertension in African Americans? Do efficacy and adverse effects of hypertension treatment differ by race? How do patient, health care system, and professional barriers contribute to poor control of hypertension? What is the role of the patient-physician relationship in improving outcomes and overcoming racial disparities in hypertension control? What do you recommend for Mr R and his physician?

Dr Cooper: Mr R is an African American man with a long history of poorly controlled hypertension and inconsistent adherence to recommended treatments. Despite serious complications such as hypertensive emergency requiring hospitalization and his awareness of the seriousness of his illness, Mr R says at times he has ignored his high blood pressure and his physicians’ recommendations. He doubts whether safe and effective treatments for hypertension exist. Because he has tried so many different medications that either did not work well or produced unacceptable adverse effects, he does not know whether he can trust physicians to help him identify the best management plan for his illness. He is perplexed about why hypertension disproportionately affects African Americans, but he does not believe he has ever received different or unfair treatment in health care settings because of his race. Moreover, he does not think it matters whether he and his doctor share the
same ethnic background. He is willing to exercise and knows he should eat a more healthful diet in order to lower his blood pressure, but he is not confident about cooking his own meals or using a home blood pressure monitor. While Mr R has continued to seek care intermittently for his hypertension, like many patients, and many African Americans in particular, he faces several barriers to effective blood pressure control at the individual level, the health system and societal level, and at the level of his interactions with health professionals.

What Is the Epidemiology and Impact of Hypertension in African Americans?

Mr R: A lot of African Americans, for whatever reasons, are privy to this disease. . . . But I just don’t think there is enough information on what causes it and on how to prevent it. . . .

Mr R’s experience is not uncommon for an African American man. Data from National Health and Nutrition Examination Survey (NHANES) 1999−2000 show African Americans are more likely than whites to have hypertension (34% vs 29%), equally likely to be aware of it (74% vs 70%) and to be treated for it (63% vs 60%), but less likely to achieve blood pressure control while receiving treatment (45% vs 56%).

Hypertension is more severe in African Americans, causing a greater burden of complications including a 1.9-fold higher risk of end-stage renal disease and a 4.6-fold higher risk of death from cardiovascular disease. Although mortality from cardiovascular disease is on the decline overall, rates continue to be 30% to 50% higher among African Americans than whites. Cardiovascular disease accounts for 35% of the excess overall mortality in African Americans, in large part because of hypertension.

Do Efficacy and Adverse Effects of Hypertension Treatment Differ by Race?

Mr R: I am saying to myself, “Why? We are all supposed to be the same inside and outside . . . I just can’t figure it out.”

Randomized trials demonstrate that antihypertensive medications can control hypertension and prevent complications in African Americans and whites. However, African Americans demonstrate reduced blood pressure responses to monotherapy with β-blockers, angiotensin-convertase enzyme inhibitors, or angiotensin-receptor blockers, compared with diuretics or calcium channel blockers. For example, a meta-analysis of 15 studies showed that the white-black difference in reduction of systolic blood pressure with angiotensin converting enzyme inhibitors and β-blockers was 4.6 mm Hg and 6.0 mm Hg, respectively, whereas this difference was −3.5 mm Hg and −2.4 mm Hg with diuretics and calcium channel blockers, reflecting somewhat greater improvement in whites than blacks for the former 2 classes and the reverse for the latter 2 classes of drugs. These differences are usually eliminated by adding adequate doses of a diuretic. A recent meta-analysis suggests diuretics are particularly beneficial for reducing risk of stroke among African Americans—with chlorthalidone, blacks experienced a 40% greater reduction in risk of stroke than nonblacks.

Mr R’s complaints focus on adverse effects from antihypertensive medication; therefore, it is especially important to consider the potential benefits of nonpharmacological therapy. He says that although he knows he should adjust his diet, he does not cook and does not plan to learn how. However, many dietary therapies and strategies, such as weight loss, reduced salt (sodium chloride) intake, increased potassium intake, DASH (Dietary Approaches to Stop Hypertension) diets (an eating plan rich in fruits and vegetables, low-fat or nonfat dairy products, low in saturated fat, total fat, and cholesterol, and including whole grains, poultry, fish, and nuts and reduced amounts of fats, red meats, sweets, and sugared beverages), vegetarian diets, moderation of alcohol intake, and partial replacement of carbohydrate with plant protein or monounsaturated fat are effective at lowering blood pressure.

Excellent evidence demonstrates that sodium reduction in persons who eat a typical American diet leads to significant reductions in blood pressure in most patients, but an even greater decrease in both systolic and diastolic blood pressure among African Americans (−8.0 mm Hg and −4.5 mm Hg, respectively) compared with whites (−5.1 mm Hg and −2.2 mm Hg, respectively). Additionally, the DASH diet leads to a reduction in systolic and diastolic blood pressure for most patients, but a significantly greater reduction in systolic blood pressure among African Americans and other minorities (−6.8 mm Hg) compared with nonminorities (−3.0 mm Hg).

Mr R complains of mental sluggishness, urinary frequency, and sexual dysfunction; he believes these are adverse effects related to his antihypertensive medications. Although adverse effects of treatment exist, among 902 adults with mild hypertension, treatment with diuretics, β-blockers, calcium channel blockers, angiotensin-converting enzyme inhibitors, or α-blockers did not impair quality of life when compared with placebo. The long-term incidence of erection problems in treated hypertensive men was relatively low, but higher with diuretic (chlorthalidone) treatment (17%-18%) than with other medications (6%-14%); this study did not specifically examine racial differences in erectile function. One study found urinary frequency to be more common (odds ratio, 1.63) among African Americans taking diuretics.

How Do Patient, Health Care System, and Professional Barriers Contribute to Poor Control of Hypertension?

Dr W: I often do wonder if there’s something else that either [the patient] hasn’t told me, or that I’m not understanding.

In a 2003 report, the World Health Organization describes 5 interacting dimensions that affect adherence to long-term therapies. These dimensions, which include social and economic factors, condition and therapy-related factors, health care system and clinician factors, patient-related factors, and patient-physician relationship factors, may also be used to help classify barriers to hypertension control.
Social and Economic Factors. Social and economic factors, such as low socioeconomic status, financial difficulties, high costs of medication, low health literacy, and unemployment may contribute to poor control of hypertension through their influence on patients' access to health care and their ability to adhere to treatment recommendations.\textsuperscript{19,20} Many of these social and economic factors affect African Americans disproportionately.

Mr R is well educated and earns a reasonable income. However, his self-employment suggests he might be affected by the high costs of medication, depending on his insurance and prescription drug coverage. The cost for a 30-day supply of antihypertensive medication ranges from about $11 or $12 for a β-blocker or diuretic to $20 for an angiotensin-converting enzyme inhibitor alone or in combination with a diuretic to $60 or $65 for some calcium-channel blockers and angiotensin-receptor blockers.\textsuperscript{21}

Condition and Therapy-Related Factors. Condition-related factors include the long-term nature of the treatment—patients are expected to require daily therapy for months or years—and the asymptomatic nature of the condition. Mr R made this point: “I know that hypertension is a silent killer. You don’t feel the effects. . . . I feel pretty strong.” Therapy-related factors that may affect patient adherence, and subsequent blood pressure control include drug tolerability, regimen complexity, frequency of dosing, the number of concurrent medications, and changes in medication.\textsuperscript{22} For example, Mr R said, “The treatments seem to be inconsistent. . . . [T]he medication kept changing.” Although Mr R’s regimen schedule is an optimal once daily dosing, he complained of several adverse effects from the antihypertensive medications he took in the past that may have affected his willingness to adhere to treatment.

Health Care System Factors. Health care system and clinician factors that may contribute to poor blood pressure control include health care financing (eg, health insurance, prescription drug coverage), health care delivery (eg, access to primary care, availability and length of appointments, availability of self-management support), health care professional factors such as knowledge of treatment guidelines, attitudes (eg, cultural sensitivity, patient-centered orientation), and technical and interpersonal skills. In a previous Clinical Crossroads, Bodenheimer addressed health care—system factors related to poor adherence to treatment for cardiovascular risk factors.\textsuperscript{23} In contrast, this article focuses more on the role of patient factors and the patient-physician relationship.

Patient-Related Factors. Patient demographic factors (eg, age, sex, race, educational background) and physical health have not been consistently related to poor adherence.\textsuperscript{21} In contrast, mental health status, including stress, depression, anxiety, and substance abuse, has been related to poor patient adherence in several studies.\textsuperscript{24-26}

In addition, several studies show that patient knowledge, health beliefs and attitudes, skills in managing their illness, and participation in care affect adherence to recommended treatments.\textsuperscript{26-29}

Mr R mentioned that he thinks he is more symptomatic when stressed—“When I do feel bad, I would have to say it is on occasions when I am at a high stress level.” Although he does not complain of depressed mood or loss of pleasure or interest, he has not been formally assessed for depression, and his apparent lack of motivation to follow through on treatment recommendations could reflect depression or anxiety. A meta-analysis reveals that depressed patients have 3 times the likelihood of being nonadherent to medical treatment recommendations.\textsuperscript{24} Moreover, depression has been associated with less adherence to antihypertensive medication (odds ratio, 0.48) and poor blood pressure control (increase in diastolic blood pressure of 2.4 mm Hg) among African Americans with high blood pressure.\textsuperscript{30}

Several health beliefs and attitudes may influence patients’ adherence to treatment, and thus to the control of their blood pressure. These include low perceived risk, low perceived need, perceived ineffectiveness of treatment, perceived harm from treatment, lack of self-efficacy, negative or avoidant coping, and different degrees of readiness to change behavior.\textsuperscript{20,31,32} For example, Mr R said, “I don’t look at [hypertension] as a disease,” and “I have developed a proclivity for self-delusion, when it comes to high blood pressure.” He also felt he did not necessarily need treatment—“I think my body has adjusted to it.” He felt antihypertensive medications were ineffective—“You get to a point where you don’t necessarily take the medication because you don’t know if it’s actually helping the problem . . . .” and indeed harmful—“The side effects are crazy after that . . . when you’re taking so many different medications to curtail the problem.” He appeared to be in denial, or in a “precontemplation stage” of readiness to change behavior and admitted to avoidant coping behaviors—“I pretty much ignored the problem, from there.” Finally, he lacked self-efficacy with regard to cooking healthful meals and using a home blood pressure monitor.

Several studies have explored lay health beliefs with regard to hypertension. For example, while physicians view hypertension as a chronic, asymptomatic condition needing pharmacological therapy, many patients believe hypertension is an intermittent but acutely symptomatic condition that can be treated with nonpharmacological therapies (eg, home remedies).\textsuperscript{33-35} Some black patients believe hypertension and high blood pressure are 2 separate diseases; the former described as aurable stress response with physiological consequences and the latter described as an incurable physiological problem caused by certain foods.\textsuperscript{36,37} Mr R seemed to subscribe to a stress model of hypertension. While some beliefs and attitudes may be more prevalent among patients of a particular ethnic background, a patient-centered approach to exploring these minimizes the likelihood that the physician will make false assumptions and engage in stereotyping.\textsuperscript{38}
Interventions to Improve Patient Adherence to Antihypertension Treatment. Results from a Cochrane review of interventions to improve patient adherence to high blood pressure treatment suggests that simplifying dosing regimens is most effective; using motivational strategies such as home monitoring, small-group training, counseling by a nurse or other professional, and reminder calls for patients are somewhat effective; and patient education alone is not effective. Two other systematic reviews of quality improvement strategies for hypertension management show team change interventions that include assignment of some responsibilities to a health professional other than the patient’s physician (such as a nurse or pharmacist) are associated with the largest reductions in blood pressure.  

These interventions included patient educational materials; home blood pressure monitoring; in-person, telephone, or Web-based motivational strategies delivered by a nurse, pharmacist, or both; and collaborative management of the patient by primary care–pharmacist teams. Eight studies showed some improvement in blood pressure control compared with the control group. Of these, 1 used patient education only and the other 7 included either nurse or pharmacist-directed programs or collaborative care of the patient with a pharmacist, providing additional evidence for the effectiveness of these approaches. Six of the studies reported the racial distribution of their patient sample; of these, 4 included a sample that was at least 30% African American. We are currently conducting a randomized controlled trial of physician and patient interventions aimed at improving communication and partnership as a strategy to improve patient adherence and blood pressure control in practices that serve a predominantly African American and low-income population; the patient intervention uses community health workers to activate patients to become more involved in their care.

What Is the Role of the Patient-Physician Relationship in Improving Outcomes and Overcoming Racial Disparities in Hypertension Control?

Mr R: The doctor I have now is great. He’s nice and calm. And he asks a lot of questions.

The patient-physician relationship is the interpersonal milieu in which patient is diagnosed, offered recommendations for treatment, and referred for tests, procedures, or care by consultants. In a review of race relationships in health care, my coauthors and I described several dimensions of relationships with a potential link to health care disparities: communication: the behavioral actions through which other relational features are observed; partnership: a union that recognizes and values the unique perspective, knowledge, and opinion of each participant; power: an inescapable aspect of all interpersonal relationships that determines whether a partnership can be formed; trust: a fundamental component of all relationships, confidence, or faith in a person; knowing: to be familiar with a person and his/her life story; and concordance: shared identities or agreement between patients and physicians across visible and invisible dimensions.

Communication. Effective communication includes many behaviors, such as using open-ended questions to probe the patients’ perspective, providing information in short and clear statements followed by opportunities for patients to ask questions, helping patients understand what they should expect from treatments, listening more and talking less, and responding with empathy to patients’ concerns. A systematic review of 35 randomized controlled trials of interventions to improve patient-physician interactions published between 1966 and 1999 found that interventions were shown to significantly alter the communication process in 22 of 30 studies; the intervention group had better health care processes, such as patient knowledge, adherence, and satisfaction in 74%, but statistical significance was reached in only 40% of studies (14 studies). Positive effects on health outcomes (typically measured subjectively, including resolution of depression, anxiety, and pain, and improvement in functional status) were statistically significantly superior in 44% of trials (11 of 25). Only 1 of the 3 trials that examined glycemic control among patients with diabetes demonstrated a significant improvement in hemoglobin A1c levels (3.0% over 3 months), and only 1 of 4 trials that examined blood pressure levels among patients with hypertension showed improvement in diastolic blood pressure at follow up (83 mm Hg in intervention vs 91 mm Hg in control patients). In an earlier systematic review that also included analytic studies of patient-physician communication, the only study that examined blood pressure as an outcome found that the frequency of patient statements in the medical history segment and the frequency of physician explanatory statements was associated with a higher level of blood pressure control (69% vs 46% respectively for patients with a high vs low frequency of statements and similar findings for high vs low frequency of physician explanatory statements). TABLE 2 shows the results of the 5 studies identified that examine the relationship of patient-physician communication behaviors with blood pressure control.

Several studies demonstrate that physicians communicate differently with white and African American patients. A study published in the 1980s found that white physicians demonstrated less empathy; concern, courtesy; information giving, and nonverbal attention when caring for African American patients than when caring for white patients.
### Table 1. Randomized Controlled Trials of Interventions Targeting Patients to Improve Adherence and Hypertension Outcomes, 2004-2009

<table>
<thead>
<tr>
<th>Source</th>
<th>Methods</th>
<th>Study Design Duration Follow-up</th>
<th>Participants Specialty Clinical Setting</th>
<th>Intervention Content Method of Delivery</th>
<th>Blood Pressure Outcomes</th>
<th>Notes Other Outcomes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hennessy et al.2006</td>
<td>Cluster 6-mo Follow-up</td>
<td>Academic health system using an ambulatory electronic medical record 93 Primary care clinicians 10,696 Patients Intervention group: 38% African American Control group: 45% African American</td>
<td>Academic detailing, provision of physician-specific data about hypertension control, provision of educational materials to the provider, and provision of educational and motivational materials to patients by mail</td>
<td>Adjusted OR for the association between the intervention and the achievement of controlled blood pressure: 1.13 (95% CI, 0.87 to 1.47). Adjusted OR, 1.03 (95% CI, 0.78 to 1.36) in patients whose blood pressure was controlled at baseline and 1.25 (95% CI, 0.94 to 1.65) in those whose blood pressure was not</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hunt et al.2008</td>
<td>12-mo Follow-up</td>
<td>463 Patients in community-based primary care clinics in Oregon Ethnicity not reported</td>
<td>Collaborative management of hypertension by primary care-pharmacist teams vs usual care (physician and patient intervention)</td>
<td>Patients receiving the intervention achieved significantly lower systolic and diastolic blood pressure vs control (137/78 mm Hg vs 143/78 mm Hg) 62% of patients in the intervention group achieved target blood pressure vs 44% of those in the control group</td>
<td>Intervention group was prescribed more medications (2.7 vs 2.4, P = .06), but did not take more pills per day Little difference between groups in knowledge, medication adherence, quality of life, or satisfaction</td>
<td></td>
</tr>
<tr>
<td>Prounie et al.2006</td>
<td>Cluster 6-mo Follow-up</td>
<td>10 Veterans Affairs Tennessee Valley Healthcare System clinics 182 Clinicians 1341 Veterans 97% Men, ethnicity not reported</td>
<td>Clinician education alone Web link to JNC VII guidelines Clinician education and a patient-specific hypertension computerized alert Or clinician education, hypertension alert, and patient education (motivational letter)</td>
<td>Education group had better blood pressure control (138/75 mm Hg) vs 146/76 mm Hg in clinician education and alert or 145/78 mm in clinician education-alone groups</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bogner et al.2008</td>
<td>Outcomes assessed at baseline and weeks 2, 4, and 6 64 Patients aged 50-80 y Comorbid depression and hypertension Large primary care practice in West Philadelphia, 81% African American</td>
<td>Usual care vs integrated care for patients with depression and hypertension delivered in 3 30-min in-person visits and 2 15-min telephone contacts by care manager</td>
<td>Participants in the integrated intervention had lower systolic blood pressure (127.3 mm Hg vs 141.3 mm Hg; P&lt;.01) and lower diastolic blood pressure (75.8 mm Hg vs 85.0 mm Hg; P&lt;.01) vs usual care participants at 6 wk 6-wk Adherence to antihypertensive medication: Integrated care, 78.1% Usual care, 51.3% (P&lt;.001)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bosworth et al.2008</td>
<td>24-mo intervention 6- and 12-mo Follow-up</td>
<td>636 Adults mean age 60.5 y 47% African American</td>
<td>Usual care vs tailored nurse-delivered behavioral intervention bimonthly over 2 y via telephone for patients</td>
<td>Medication adherence increased by 9% in behavioral (62% to 72%) vs 1% in usual care (67% to 68%) at 6 mo</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Green et al.2008</td>
<td>3 Groups 12-mo Intervention 12-mo Follow-up</td>
<td>778 Adults aged 25-75 y 83% White 8% African American 50% College graduates Integrated group practice that also provides coverage</td>
<td>Usual care vs home blood pressure monitoring and secure Web site training alone or plus pharmacist care via Web communication for patients</td>
<td>Percentage change in blood pressure control: No significant difference from home monitoring with Web vs usual care (36% vs 31%) Significant difference pharmacist care and home monitoring with Web vs usual care (86%; P&lt;.001) Significant difference in pharmacist care vs home monitoring only (P&lt;.001)</td>
<td>Greater improvements in percentage of blood pressure control and reductions in systolic and diastolic blood pressure among patients with systolic blood pressure ≥ 160 mm Hg</td>
<td></td>
</tr>
<tr>
<td>Lee et al.2006</td>
<td>2- mo Run-in fol- lowed by 6-mo prospective observational intervention followed by 6-mo continued pharmacy vs usual care RCT</td>
<td>200 Community-based patients aged ≥65 y taking ≥4 medications for long-term diseases 32% African American</td>
<td>Comprehensive pharmacy care program of standardized medication education, regular follow-up by pharmacists, and medications dispensed in time-specific packs vs usual care</td>
<td>Change in systolic blood pressure: Pharmacy care, −6.9 mm Hg (95% CI, −10.7 to −3.1) Usual care, −1.0 mm Hg (95% CI, −5.9 to 3.9; P = .04)</td>
<td>After 6 mo persistence of medication, adherence decreased by 69.1% for usual care, whereas it was sustained at 95.5% in pharmacy care group (P&lt;.001)</td>
<td></td>
</tr>
<tr>
<td>McLean et al.2008</td>
<td>4 Follow-up visits through 6 mo</td>
<td>14 Community pharmacies in Edmonton, Alberta, Canada 227 Patients with diabetes mellitus with blood pressure higher than 130/80 mm Hg on 2 consecutive visits 2 wk apart Ethnicity not reported</td>
<td>Comprehensive care from a pharmacist and nurse team with links to primary care provider vs minimal intervention or attention control</td>
<td>The intervention group had an adjusted mean (SE) greater reduction in systolic blood pressure at 6 mo of 6.6 (2.1) mm Hg vs controls</td>
<td>In the subgroup of patients with a systolic blood pressure &gt; 160 mm Hg at baseline, experience reduction by an adjusted mean (SE) of 24.1 (1.9) mm Hg more in intervention patients than in controls (P&lt;.001)</td>
<td></td>
</tr>
</tbody>
</table>

(Reprinted) JAMA, 2009;301(12):1265

©2009 American Medical Association. All rights reserved.
Other studies have shown that African Americans also experience visits in which physicians use a more narrowly biomedical communication style, 71 are more verbally dominant, and have less positive emotional tone. 72

Patients need information about their condition and its treatment (eg, risk, effectiveness, prognosis) to participate in decisions about their care. Thus, communicating about clinical evidence is an important part of building a collaborative patient-physician relationship. However, there is a dearth of evidence to guide physicians about how they can most effectively do this. A systematic review of original research studies published through 2003 dealing with communication between physicians and patients and directly assessing methods of presenting clinical evidence to patients identified only 8 potentially relevant articles and concluded that relative risk reductions may be misleading when communicating with patients and absolute risk is preferred; the order of information presented and the time frame of the outcomes can bias patient understanding; use of human stick figure graphics or faces for single probabilities and vertical bar graphs for comparative information is supported by limited evidence; less-educated and older patients preferred proportions to percentages and did not appreciate confidence intervals; studies of decision aids rarely addressed patient-physician communication directly; and no studies addressed clinical outcomes of discussions of clinical evidence. 75

| Table 1. Randomized Controlled Trials of Interventions Targeting Patients to Improve Adherence and Hypertension Outcomes, 2004-2009 (continued) |
|---|---|---|---|---|---|
| Source | Methods | Participants | Intervention Content | Blood Pressure Outcomes | Notes |
| Schroeder et al, 2005 | Patient Intervention Only | 245 Patients with uncontrolled hypertension from 21 general practices in Bristol, England | Nurse-led adherence support for patients with uncontrolled high blood pressure vs usual care | No difference in blood pressure at follow-up between groups: Systolic, −2.7 mm Hg (95% CI −7.2 to 1.8); Diastolic, 0.2 mm Hg (95% CI −1.9 to 2.3) | No evidence of an effect of the intervention on timing compliance at follow-up (adjusted difference in means, −1.0%; 95% CI, −5.1 to 3.1) |
| Tobe et al, 2006 | 12-mo Follow-up | 99 First-nations patients with existing hypertension and type 2 diabetes mellitus randomized (95 were included in the follow-up analysis) | Community-based treatment strategy implemented by home care nurses for patients vs usual care by primary care physician | Both groups experienced a significant reduction in systolic blood pressure by the final visit (−24.0 mm Hg; intervention; −17.0 mm Hg control; P < .001 in each case) | Intervention group had a larger decrease in diastolic blood pressure over time than did control group (−11.6 mm Hg vs −6.8 mm Hg; P = .05) |

Abbreviation: CI, confidence interval; JNC, Joint National Committee; OR, odds ratio.

| Table 2. Studies Examining Relationship of Patient-Physician Communication to Blood Pressure Control |
|---|---|---|---|
| Source | Duration of Follow-up | Participants | Intervention Content and Method of Delivery/Study Measures | Blood Pressure Outcomes, mm Hg |
| Orth et al, 1987 | 2-wk Follow-up | 217 Adults with hypertension at US community health centers | Patients express themselves in their own words (exposition). Clinicians give explanations (explanations) | Comparing high vs low exposition/explanations: 68.9% of patients had decreased blood pressure vs 46.1% did not, P < .05 |
| Kaplan et al, 1989 | 8-12 wk Follow-up | 105 US Adults with hypertension Mean age, 54 y; 68% Women; 62% Spanish speaking | Patients provided with individualized information about their medical care, coached to increase participation in care | Mean of 3 diastolic blood pressure readings each from 44 patients at follow-up: 83 mm Hg intervention group vs 91 mm Hg control group, P < .05 |
| Meland et al, 1997 | 12-mo Follow-up | 22 General practitioners in Norway 110 Adult male patients with coronary heart disease risk | Patient educational session to encourage and sustain the patient’s current health promotion efforts Clinicians told to serve advisory function only, respect patient choice, and make written contracts with patients | No difference in mean systolic and diastolic blood pressure between groups |
| Kinmonth et al, 1998 | Half-day training (general practitioners) 2½-day training (nurses) 12-mo Follow-up | 23 UK general practitioners, 53 practice nurses 250 Adults with diabetes mellitus | Practices received British Diabetic Association guidelines and patient resources Reviewed evidence for patient-centered approach Encouraged to consider both clinician and patient’s agendas Given booklets for patients to prepare for visits | Mean of 2 blood pressure readings: Systolic: 144.5, intervention vs 142.8, control Diastolic: 89.0, intervention vs 87.2, control Differences between groups not statistically significant |
| Pill et al, 1998 | 2 training sessions, 1.5 h each 12-mo Follow-up | 29 UK primary care general practitioners and nurses 172 Adult patients with type 2 diabetes mellitus | Used principles of motivational interviewing Encouraged clinician to negotiate individual health plans based on the patients’ perceptions about their disease and readiness to change their lifestyles | Mean blood pressure difference from baseline to follow-up: Systolic: −1.47, intervention vs 3.12, control Diastolic: −0.343, intervention vs 0.650, control Differences in change not statistically significant |
**Partnership.** Partnership, or a participatory communication style, may be characterized as providing clear instructions and information about the treatment and its purpose; relating to patients in an approachable, friendly, or supportive manner; soliciting and listening to the patient’s views; using a “participatory” or nonauthoritarian manner of problem solving and conflict resolution; and offering the patient choices, control, and responsibility.\(^{74,75}\) In observational studies, a participatory decision-making style has been associated with higher patient satisfaction and continuity of care,\(^{73}\) improved self-care behaviors in diabetes,\(^ {30}\) greater adherence to antidepressant medicine,\(^ {77}\) resolution of depression,\(^ {78}\) and continuation of therapy with statins.\(^ {79}\) It also has been linked to having a home blood pressure monitor but not to frequency of monitoring or blood pressure control.\(^ {80}\)

One study of patients with human immunodeficiency virus (HIV) showed that compared with patients who prefer to share decisions with their physician, those who want to make all decisions themselves did not initiate prescribed medications.\(^ {81}\) Additionally, patients who want physicians to decide for them were less likely than those who preferred participatory decision making to adhere to the medications that they were already taking. These outcomes suggest that the shared decision-making relationship as practiced by physician and patient is best for patient outcomes.\(^ {82}\) Unfortunately, African Americans rate their visits with physicians as less participatory.\(^ {83}\) Mr R interestingly stated that his belief was that, “You basically leave treatment up to the doctors.”

**Power.** Whether a partnership is formed is determined in large part by the power dynamics in the patient-physician relationship. Power originates from 3 sources: social authority, material resources, and information and knowledge.\(^ {84}\) Power can be used productively or misused. How power is used and exchanged is influenced by personal qualities of the physician and patient and the nature of the relationship (eg, trust, ethics, and communication). Physicians need power to share information, respond to patients’ cues, and obtain a full understanding of patients’ wants (accountability); help patients tell their stories, express preferences, and make informed decisions (autonomy); act in a trustworthy manner on behalf of patients (fidelity); and interact with patients with sensitivity and compassion (humanity). Patients need power to have their health needs met, and meet their own responsibilities (eg, to decide what are health problems to them and whether they are able and willing to adhere to treatment recommendations).\(^ {84}\) Elements of power in therapeutic relationships are expressed through the individual who sets the agenda and goals, the role of the patient’s values, and the functional role of the physician. Researchers and ethicists have described 4 models of the patient-physician relationship—mutuality, in which physician and patient power are high; consumerism, in which the patient has high power; paternalism, in which the physician has high power; and a default condition in which power is low for both the patient and the physician.\(^ {85}\)

The mutuality model is one in which the goals and agenda are negotiated, the patient’s values are jointly examined, and the physician’s role is as an advisor. The consumerism model is one in which the patient sets the agenda, values are not examined, and the physician’s role is as a consultant. The paternalism model is one in which the physician sets the goals and agenda, the patient’s values are assumed, and the physician’s role is as a guardian. Finally, the default model is one in which the goals and agenda, patient’s values, and physician’s role are all unclear. Mr. R seemed to feel powerless—“I have no clue what causes it . . . I really don’t have answers to it.” He also seemed to feel that physicians might be powerless to help him control his blood pressure—“I think doctors are human . . . I think they make the same mistakes that other people make.” The model that is most beneficial for both patient and physician, even when the patient does not explicitly prefer an active role, is the one in which each has a high level of power.\(^ {86}\) Some patients may have cultural beliefs that suggest deference to authority figures, and as such, may consider it inappropriate to have an egalitarian relationship with their physician in which power is shared. The influence of such beliefs on the patient-physician relationship deserves further study.

**Trust.** Trust is the degree to which people see one another as competent, responsible, caring, tactful, and ethical.\(^ {87}\) It is a fundamental component of all relationships and is linked to quality of care and patient outcomes, including patient adherence,\(^ {79,88}\) satisfaction,\(^ {80}\) continuity of care,\(^ {90}\) self-rated health,\(^ {89}\) and use of preventive services.\(^ {81}\) Focus groups,\(^ {82,83}\) and cross-sectional survey studies\(^ {94,95}\) show that patients have greater levels of trust in physicians who show interest, empathy, and respect; take time to listen, engage in more partnership-building and collaboration; are honest, informative, thorough, and accurate in their evaluations; and provide appropriate and effective treatment. In one study, for each one point increase in the physicians’ patient-centered communication rating on a 12-point scale by third-party observers, patients’ reports of trust increased by 0.22 points on a 10-point scale.\(^ {94}\) A systematic review of interventions designed to improved patients’ trust in physicians revealed 3 studies, only one of which showed that educational introductory visits for new patients to a health plan, done in group format, improved trust from 7.1 to 8.8 points on a 10-point scale.\(^ {96}\) Many studies show minorities have less trust in physicians than do whites.\(^ {97,98}\) Trust may be playing a role in Mr R’s apparent nonadherence to his treatment regimen. After seeing several physicians over the years for his hypertension, he said he wondered, “Do I believe this doctor or that doctor?”

**Knowing.** Although Mr R has been seeing his doctor on and off for several years, it is unclear how well they really know one another. Knowing is to be familiar with a person and his or her life story. Clinicians’ knowledge of the unique attributes of individual patients is associated with continu-
ity of care and patient adherence.99,99 Persons of color are less likely than whites to feel that physicians know them or understand their background and values.100,101 Stereotyping occurs when group characteristics are ascribed to individuals; it is a cognitive shortcut that one takes when one does not know another person as an individual. In a cross-sectional survey study of 193 middle-aged physicians (mean age, 45 years), predominantly white or Asian, male, and cardiology specialists, participants reported negative opinions about African Americans' intelligence, treatment adherence, and other health behaviors. Such opinions were not corroborated by patients' self-reports of these same factors.102 Physicians in the same study reported less affiliation (possibility of being friends) with African American patients. Two more recent survey studies, one that included 287 internal medicine and emergency medicine residents who were 29 years old on average, 60% male, 65% white, and 23% Asian or Pacific Islander and another that included academic pediatricians, 59% of whom were residents, 65% women, 93% US natives, and 82% non-Hispanic white showed that physicians, like others in society, show an implicit preference for European Americans relative to African Americans on a validated test called the Implicit Association Test.103,104 Such biases, while sometimes unconscious, were linked in clinical vignettes to lower cardiovascular procedure referral rates for black patients.105

**Concordance.** Concordance has been defined as shared identities between patients and physicians across visible (race/ethnicity, age, sex, education, language) and less visible (beliefs, values, preferences) dimensions.99,103 Race concordance, defined as shared racial or ethnic identities between clinicians and patients, is related to patient reports of satisfaction, participatory decision making, timeliness of treatment, and trust in the health system.81,106-108 Concordance with regard to beliefs about care is also an important determinant of satisfaction and trust.110,111 When asked whether he thought an African American physician would understand him better, Mr R said, “No.” Yet, his physician thought it difficult to care for a patient who belongs to another culture. Culture is defined as a shared system of values, beliefs, and learned patterns of behaviors,112 and it may be shaped by many factors, including age, sex, race, ethnicity, and educational attainment. The cultural difference to which this physician referred may have occurred across 1 or more dimensions. Although race concordance is not necessarily an indicator of overall sociocultural concordance, it is one dimension that has been covered in the literature that seeks to understand racial disparities in health care. Studies have shown that race-concordant visits are significantly longer (by 2.5 minutes on average) and have more positive patient affect. These findings are true both for African American and white patients.72,107,112 Patients in race-concordant relationships also rate their physicians as more participatory (8.42 points on a 100-point scale) and satisfactory (73% strongly agree in race-concordant vs 57% in race-discordant encounters) regardless of the communication that takes place in the visit, suggesting that other factors, such as patient and physician attitudes and expectations, may play a role in these dynamics.107 New research shows that cumulative social discordance between physicians and patients (eg, across race, sex, age, and educational level) is associated with lower ratings of patient satisfaction.72

**What Do You Recommend for Mr R and His Physician?**

For Dr W, clinical strategies such as those described by Kleinman et al113 that apply concepts from cultural anthropology—that is, questions that elicit the patient's explanatory model of illness, agenda, and illness behaviors—to help identify and resolve relational issues in clinical care, are recommended. Exploring the patient's explanatory model includes the use of the following types of questions: What do you think has caused your problem? What do you call it? Why do you think it started when it did? How does it affect your life? How severe is it? What worries you the most? What kind of treatment do you think would work?113 The physician might also learn how to use motivational interviewing principles.114

Dr W should keep his calm demeanor; the patient seems to like his style of interacting with him. This contrasts with other physicians the patient encountered when in an emergency department; they tried to motivate him by providing negative statistics about risks associated with uncontrolled blood pressure. Providing the patient, in a calm manner, with information about his risk for myocardial infarction and stroke that might impair his ability to care for his children, given that he has electrocardiographic evidence of left ventricular hypertrophy (LVH) might motivate him to change his behavior. For example, the patient might find it relevant that 57% of stroke patients had LVH compared with 33% of controls—translating to a 2-fold higher risk of ischemic stroke for patients with LVH.115

Second, the physician should try a participatory approach. This would include open-ended questions, reflective listening, and avoiding arguments in which he tries to change the patient's views. For example, he might ask Mr R, “What works best for you?” He might also say, “Do you think medical science still hasn't found a solution to the problem of hypertension?” This approach may allow the patient to develop awareness of apparent conflicts among his knowledge, values, and behaviors. He also might say something along these lines: “Let me see if I have this right. You are basically a healthy person, and you'd like to stay that way.” Another part of the motivational-interviewing approach is recognizing that change takes time and can only happen if the patient himself decides that it will. Encouraging his autonomy is important. The physician should express confidence in the patient's ability to make good decisions for himself. At the same time, the physician should offer support through open-ended statements, such as “How can I be more helpful to you?”
Third, the physician should get to know the patient better as a person. What is important in his life other than his children? He could probe him further about psychosocial issues. How does he handle stress? Who gives him support—emotional and tangible? Would he be open to having someone he is close to come to an appointment with him?

Fourth, the physician should consider screening the patient for depression. Physicians engage in less discussion about depression and less rapport building with depressed African Americans than whites, and depression may contribute to adherence problems. The physician might ask the patient to bring his home blood pressure monitor into the office to have it checked for accuracy and ask one of the nurses to work with the patient to help him learn how to use it. Home blood pressure monitoring has been shown to improve patient adherence.

Finally, the physician should recognize the limits of his influence and encourage Mr R to take responsibility for the changes he wants. For example, with regard to his medication, the physician might give him information regarding low rates of adverse effects with diuretics at lower doses. The patient can then decide if he is willing to try diuretics again, but at a lower dose. If he will not make the changes discussed, the physician should not take it personally and try not to let it frustrate him.

For Mr R, first, he might consider stress management training such as meditation, to reduce his stress level. Second, he should put a priority on exercise because it has documented benefits for patients with hypertension and is something he enjoys. Third, he might enlist the support of friends and family and consider bringing someone he trusts to his next appointment. Fourth, with regard to dietary issues, he might ask his physician to refer him to a nutritionist who is able to provide culturally tailored advice. In one study, diet programs tailored to the needs of African Americans can lead to significant improvement in clinical parameters such as weight (−14.8 lb), total cholesterol (−13.8 mg/dL) and blood pressure (systolic, −4.3 mm Hg; diastolic, −2.4 mm Hg) over 8 weeks. In the meantime, he could try low-salt versions of processed foods and fast foods by reading food labels and should look up the DASH diet online (http://www.nhlbi.nih.gov/health/public/heart/hbp/dash/new_dash.pdf). It suggests that eating more fruits and vegetables will help reduce his blood pressure, particularly as an African American. Fifth, with regard to medication, if his physician suggests it, he should consider taking a diuretic at a lower dose than in the past. At low doses, diuretics do not usually cause sexual problems or urinary frequency. And finally, because they seem to be working well, he should keep taking the medications he is currently taking and should not stop them without discussing it with Dr W first because his blood pressure could get dangerously high. He might not notice complications in the short term, but as he noted himself, over time, this could lead to devastating consequences for him—either death or disabil-

©2009 American Medical Association. All rights reserved.
scendental meditation was shown to be effective in reducing blood pressure among African Americans, but the reduction was greater in women than in men. 118

**QUESTION:** What about augmentation of dosage of medication? When a patient is reluctant to take medication for some reason, such sentiment often feeds back to doctors. They, in turn, may be reluctant to increase the dose of the medication. This is especially true if they are not sure the patient is actually taking the medicine in the first place.

**Dr Cooper:** Hicks et al 127 showed that African Americans and whites were more likely than Hispanics to have Joint National Committee (JNC VI)–appropriate therapy (eg, angiotensin-converting enzyme inhibitors or angiotensin-receptor blockers for patients with diabetes, renal insufficiency, or congestive heart failure; β-blockers for patients with coronary artery disease or history of myocardial infarction; and diuretics or calcium channel blockers for patients who are aged 60 years and older or are African-American) and to have the dosages of their medications augmented. Augmentation or intensification of medication dosages was associated with blood pressure control in all ethnic groups. Patients’ reluctance or preferences for less aggressive treatment may indeed influence a clinician’s recommendations, but most racial disparities in treatment are not explained by patient preferences. 128,129 It is important to remember that even if a patient is reluctant to accept treatment, it is up to the physician to probe for the patient’s concerns, fears, and expectations. In many cases, when a patient’s concerns are addressed, he may be willing to undergo a particular test or try a particular treatment. In this case, Mr R liked the idea of starting his medication at a low dose and gradually increasing it, in order to minimize the adverse effects.

**Dr W:** Thanks for the talk and for a lot of the tips. There are definitely a few things I’m going to try to address with him the next time I see him. But part of his problem centers on education. He doesn’t necessarily understand everything I tell him, and he may have received a lot of conflicting reports. There is a lot I would like to say, but 20 minutes is very limiting! Are there resources you would recommend that he can read or look up?

**Dr Cooper:** Twenty minutes is not a lot of time to accomplish all that is needed in a visit for a patient with a chronic medical illness, particularly when there are complicated cultural or psychosocial issues to address. There is a lot of information he could read from reliable sources on the Internet, but he seems busy and overwhelmed. Even though he knows resources are out there, he may not take advantage of them. He would likely benefit from working with a motivational coach or a care manager—somebody who can look up information for him and help him figure out ways to eat more healthfully, get his medications from a convenient and cost-effective place, keep his appointments, and communicate more effectively with you about his concerns. Our health care system does not generally provide or reimburse such support for people with high blood pressure. Collecting good evidence for effectiveness in diverse settings for diverse patients would help us advocate for payment policies that could make these changes happen.

**Financial Disclosures:** None reported.

**Funding/Support:** This work was supported by grant K24HL083113 from the National Heart, Lung, and Blood Institute (NHLBI).

**Role of the Sponsor:** The NHLBI had no role in the preparation, review, or approval of the manuscript.

**Additional Contributions:** I thank the patient for sharing his story and for providing permission to publish it and thank Tom Delbanco, MD, and Ann Mattson-DiCicco, MD, Division of General Medicine and Primary Care, Beth Israel Deaconess Medical Center, Boston, Massachusetts, and for their assistance with the manuscript as part of their regular duties.

REFERENCES


40. Lee JK, Grace KA, Taylor AJ. Effect of a pharmacy care program on medication adherence and persistence, blood pressure, and low-density lipoprotein cholesterol: a randomized controlled trial. JAMA. 2006;296(21):2563-2571.


52. Stewart MA. Effective physician-patient communication and health outcomes: a review. CMAJ. 1995;152(9):1423-1433.


59. Svarstad BL. Patient-practioner relationships and compliance with prescribed medical regimens. In: Aiken LH, Mechanic D, eds. Applications of Social