

Self-Reported Influences of Hopelessness, Health Literacy, Lifestyle Action, and Patient Inertia on Blood Pressure Control in a Hypertensive Emergency Department Population

JaNae Joyner-Grantham, PhD, David L. Mount, MA, PsyD, Orita D. McCorkle, BS, Debra R. Simmons, RN, MS, Carlos M. Ferrario, MD and David M. Cline, MD

Abstract: *Background:* In response to almost universally recorded poor blood pressure (BP) control rates, we developed a novel health paradigm model to examine the mindset behind BP control barriers. This approach, termed patient inertia (PtInert), is defined as an individual's failure to take responsibility for health conditions and proactive change. *Methods:* PtInert was evaluated through a survey instrument conducted in 85 subjects with a prior history of hypertension seen in an emergency department. The survey tool encompassed the Wide Range Achievement Test 4, the brief symptom inventory, and a PtInert questionnaire. *Results:* Fifty percent of patients reported slight psychological distress (psychosomatic > anxiety > depression), with 61% possessing hopelessness surrounding complications from high BP no matter their actions. An unanticipated finding was that patients who had a low reading proficiency (83.1 + 16.4 Wide Range Achievement Test 4 standard score) self-reported high levels of hypertension health literacy. Less than half of patients transferred this health literacy into lifestyle changes in diet, exercise, and medication adherence. Although patients felt that they could control their BP and frequently thought about better BP control, 55% of the subjects had uncontrolled hypertension (>140/90 mm Hg). *Conclusion:* Hypertensive patients visiting our emergency department perceive themselves to have adequate hypertension health-related literacy that was not transferred into hypertension health protective behavioral practices. Psychological distress and a sense of hopelessness surrounding BP control contribute to the lack of protective behavioral health practices. Further evaluations of PtInert methods to promote successful proactive change and adherence warrant further study.

Key Indexing Terms: Inertia; Hypertension; Brief symptom inventory; Attitude; Behavior. [Am J Med Sci 2009;338(5):368–372.]

Hypertension is a major risk factor for cardiovascular disease morbidity and mortality affecting ≥ 65 million American adults.¹ Controlling blood pressure (BP) is crucial to the prevention of adverse cardiovascular outcomes; however, only one third of all hypertensive patients have their BP under control (<140/90 mm Hg), with greater disparities and prevalence among African Americans.^{2–4}

Although recent studies underscore the role of physicians in the control of BP, it is known that BP control also involves the patient and the patient-physician interaction. Recent literature has examined the contribution of provider clinical inertia⁵ and the subsequent rationale behind the failure of clinicians to intensify chronic disease treatment and drug therapy.⁶ Patient behaviors, including medication adherence,⁷ improved diet and exercise, and weight loss,⁸ have been shown effective in reducing and controlling BP. Sociodemographic and clinical features have also been associated with compliance.^{9–11} Despite the likelihood that patient psychosocial and behavioral characteristics may be important determinants of BP control, few studies have defined the impact of these factors on BP medication adherence and lifestyle regimens.

Therefore, we hypothesize that a significant determinant of uncontrolled hypertension is the result of patient behaviors, attitudes, and mindset toward individual hypertension control. In response to this health assessment gap, we have coined a novel health paradigm model called patient inertia (PtInert). A working definition for PtInert is the temporary disabling and absence of motivation to actively engage in self-protective behaviors that would reduce, delay, and/or eliminate problematic self-management behaviors as demonstrated in the PtInert conceptual model (Figure 1).

We define hypertension PtInert as the inability to assume adequate hypertension self-management behaviors, leading to poorly controlled hypertension when awareness and knowledge of the condition as well as self-care practices are understood. We are cognizant of the bidirectional relationship existing between hypertension self-care practice and differential access to medical care for traditional underserved and economically disadvantaged populations. Nevertheless, the key to reducing disparities in hypertension outcomes is developing a framework that places the patient as the central element for the effectiveness of the treatment paradigm.

In this study, we assessed issues and identified gaps related to PtInert factors and the control of BP in hypertensive emergency department (ED) patients. The ED is an environment that treats a large number of cases of hypertension crisis most commonly in patients with known hypertension who have failed to comply with their medication and therapeutic recommendations.^{12,13}

METHODS

Our study used a convenience sample and a facilitated self-report survey conducted through a one-on-one interview with the investigators. During a 9-month period beginning in November 2007, any English-speaking individual (aged 18 years or older) who had a history of hypertension within the Wake Forest University Baptist Medical Center ED was invited to participate in the PtInert comprehensive survey. Potential participants were located using the ED electronic medical

From the Consortium for Southeastern Hypertension Control and Wake Forest University Hypertension and Vascular Research Center (JJ-G), Winston Salem, North Carolina; Department of Internal Medicine and the Maya Angelou Research Center on Minority Health (DLM, ODM), Wake Forest University, Winston Salem, North Carolina; Consortium of Southeastern Hypertension Control (DRS), Winston Salem, North Carolina; Wake Forest University Hypertension and Vascular Research Center (CMF), Winston Salem, North Carolina; and Wake Forest University Emergency Department (DMC), Winston Salem, North Carolina.

Submitted January 12, 2009; accepted in revised form June 5, 2009.

Correspondence: JaNae Joyner-Grantham, PhD, Consortium for Southeastern Hypertension Control, PO Box 5097, Winston Salem, NC 27113-5097 (E-mail: jjoyner@wfubmc.edu).

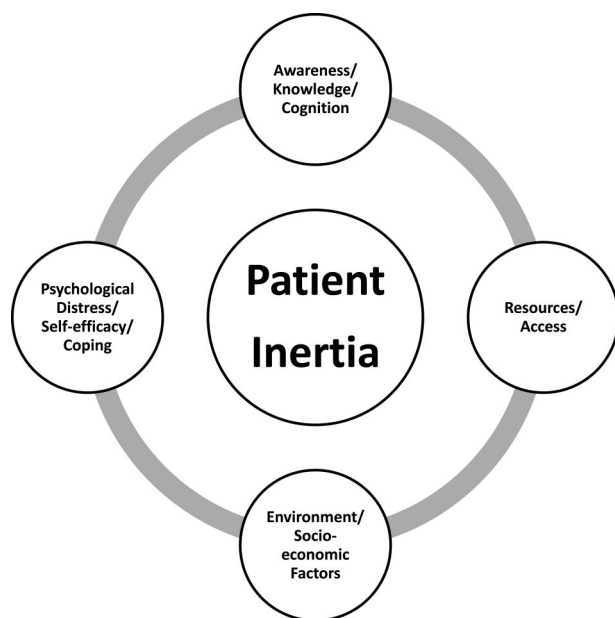


FIGURE 1. Conceptual model demonstrating proposed components of patient inertia (PtInert).

record system. The PtInert survey questions were derived from the experience of an accredited hypertension specialist (C.M.F.), a hypertension fellow (J.J.-G.), an emergency medicine physician who specializes in cardiovascular disease management (D.M.C.), and a health psychologist (D.L.M.). For items to be included, an agreement of consensus was obtained from the expert panel. Based on the critique of items from the expert panel, the properties of each item are believed to measure the intended subject matter. The item selection and content of these items have a logical consistency in that each item is relevant to health-related behavior among persons diagnosed with hypertension.

The PtInert survey instrument comprised 3 tests administered through a 25-minute face-to-face interview with ED patients. Protocols and consent forms were approved by our institutional review board. This comprehensive survey included 2 previously validated tools: (1) the Wide Range Achievement Test 4 (WRAT 4) [Blue Form, Wilkinson & Robertson, 2006] word reading test that measures letter and word decoding through letter identification and word recognition; and (2) the Brief Symptom Inventory (BSI) that measures psychological distress and psychiatric disorders in medical and community populations. The WRAT4 has undergone several revisions, is widely used as a norm-referenced measure of basic academic skills, including reading, and was standardized on a sample of 3007 individuals across a wide age range of 19 age groups (5–94 years). Advantages of the WRAT4 reading are (1) it takes <5 minutes to be administered; (2) a percentile and education level can be determined; and (3) professional time used in collection of data is minimal. On the basis of population averages, the average WRAT4 reading subtest score is by definition 100 with scores >100 indicating a higher than average reading ability and scores <100 indicating a lower than average reading ability.

The BSI, an 18-item self-report inventory of psychopathology and psychological distress, was developed for referred and nonreferred populations. The BSI-18 measure was selected

because it identifies equally well affective symptoms, anxiety symptoms, and somatic symptoms of mental health disorders, making it appropriate for populations who present with somatic symptoms secondary to chronic illness. Individuals endorse each item on the BSI on a 5-point Likert scale of distress where 0, not at all; 1, a little bit; 2, moderately; 3, quite a bit; and 4, extremely for a total global severity index (GSI) score of 72 possible points ([maximum number of points per question (4)] × [number of questions (18)] = [total possible points (72)]). The GSI represents a respondent's overall level of psychological distress. Positive cases can be identified by a GSI score of ≥63 or any 2 subscales where the T-score is ≥63. The BSI items analyze 3 behavioral components labeled: somatization, depression, and anxiety.

In addition, patients were administered a PtInert survey specific to BP control. A slightly modified 4-item Morisky scale for medication adherence was incorporated within the PtInert survey.¹⁴ Most questions in the PtInert survey were multiple-choice closed-ended questions that use a 5-point Likert scale (1, strongly agree; 2, somewhat agree; 3, neutral; 4, somewhat disagree; and 5, strongly disagree). Other questions were yes/no/sometimes, scaled, or fill in the blank type. The PtInert questions were designed to test barriers to care, emotions, and feelings toward these barriers and toward BP control. Questions include topics such as medication adherence, medication side effects, physician trust and interaction, clinical inertia, exercise, diet, cost of care, competing demands, and social stress.

Patient records were assessed for presenting BP, subsequent measurement, and administration of any medication that could affect BP. The seventh report of the Joint National Committee on Prevention, Detection, Evaluation, and Treatment of High Blood Pressure (JNC7) criteria were used to determine BP control (<140/90 mm Hg or <130/80 mm Hg in diabetes/chronic kidney disease), using the second measured BP before the administration of medication.

Of the 98 subjects invited, 85 individuals participated in the study. Arbitrary numbering was assigned to descriptive survey responses before entry into the Statistical Package for the Social Sciences program where patients were de-identified. Descriptive statistics, including frequencies, percentages, means, and standard deviations, were calculated for variables. All data are reported as mean ± standard deviation. Correlation was calculated using Pearson correlation coefficient.

RESULTS

Patient Characteristics

The sociodemographic and clinical characteristics of the sample are summarized in Tables 1 and 2. On average, patients had a high school education (12.4 ± 3.1 years), a lower than average reading ability (WRAT 4 standard score = 83.1 ± 16.4), and 54.5% of patients had occupations defined as skilled, 6.5% were semi-skilled, and 39.0% were laborers.

Patient Perception of Clinical Inertia

As part of the survey tool, patients were asked questions to determine their perception of their individual physician clinical inertia. The ethnicities and gender of physicians who treated surveyed patients regarding BP control were 78% whites and 14% African Americans and 57% men and 43% women, respectively. Sixty-three percent of patients agreed that their physician changed their BP medication if the current therapeutic approach was unable to control their BP. Seventy-nine percent of surveyed patients replied that they were not

TABLE 1. Sociodemographic characteristics of surveyed emergency department patients

Gender (male/female), %	57/43
Race (African American/Caucasian), %	64/36
Age (yr)	52 ± 11
Birthplace (inside Forsyth county/ outside Forsyth county), %	43/57
Marital status	
Single	32%
Married	39%
Divorced	25%
Widowed	4%
Number of children	
None	21%
One	13%
Two	30%
Three	15%
Four or more	21%
Number living in household	
One (living alone)	28%
Two	33%
Three	16%
Four or more	23%

frustrated with the time it took for their physician to change their BP medication.

Psychological Status

In this study, 50.1% of patients reported having some psychological distress, selecting BSI answers greater than 0 on the 0 to 4 scale. On average, the psychological status score was 19.7 out of 72 possible points, demonstrating slight (3 on a 10-point scale) psychological distress for the patient sample. When the BSI test was subscored, patients were affected mostly by somatization (3 on a 10-point scale) followed by anxiety (2 on a 10-point scale) and depression (2 on a 10-point scale).

Patient Adherence

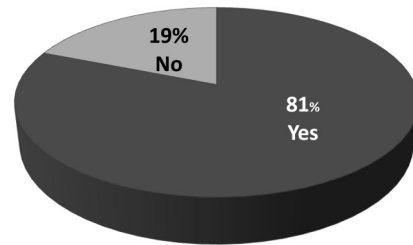
The patient percentages of surveyed individuals who visit a physician for BP management and who adhere to BP medication regimens are depicted in Figure 2. Patient reasons for failing to comply with BP medication regimens included their inability to pay for BP medications (36%), stopping BP medications if they felt better (35%), difficulty remembering to take BP medication (32%), and stopping BP medication if they felt worse (25%).

TABLE 2. Clinical characteristics of surveyed emergency department patients

Triage systolic BP (mm Hg)	150 ± 33
Triage diastolic BP (mm Hg)	97 ± 19
BMI	28.8 ± 6.8
Heart disease (%)	26.2
Diabetes (%)	25
Stroke (%)	6
Total medications (n)	8.6 ± 6.8
BP medication(n)	1.8 ± 1.2

BMI, body mass index; BP, blood pressure.

A Do you see a doctor concerning BP control?



B Did you forget to take your BP medication (last 12 months)?

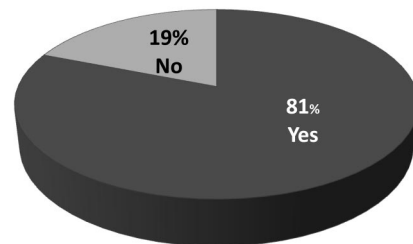


FIGURE 2. Patients regularly visit physicians concerning their blood pressure (BP) management (A). However, patients do not adhere to recommended BP medication regimens (B).

Patient Thoughts Concerning BP Control

A large percentage of hypertensive ED patients surveyed agreed with the statement “I will have complications with high BP no matter my actions” (Figure 3). In addition, 67% of patients thought that they could control their BP, and 72% of patients admitted to thinking about better BP control within the last month. Fifty-five percent of patients surveyed had uncontrolled hypertension (>140/90 mm Hg).

Presenting Illness

Surveyed patients presented to the ED primarily with manifestation of acute illness (80%), with the remainder presenting with chronic illness (17.6%), and 2.4% presenting secondary to trauma. No correlation (Pearson correlation coefficient = 0.158) was found between uncontrolled hypertension and presenting illness.

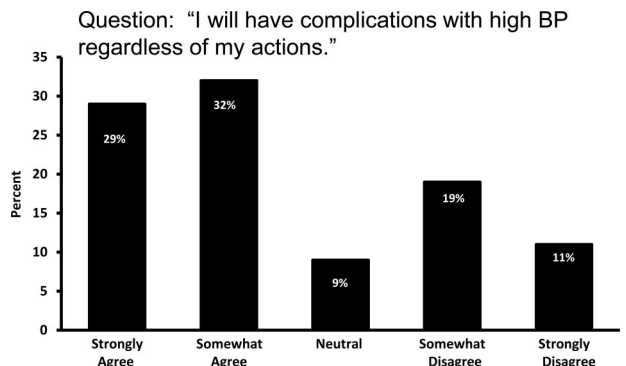


FIGURE 3. Sixty-one percent of surveyed participants agree (29% strongly; 32% somewhat) that they will have complications from high blood pressure (BP) no matter their actions.

Hypertension Health Literacy and Lifestyle Intervention

Surveyed patients have high hypertension health literacy demonstrating sufficient knowledge of activities they should be doing to lower their BP. They reported that the following were very important in the management of BP: heading their physician's medical instructions (99%), stress management (95%), physical activity/exercise (92%), healthy diet (89%), BP monitoring (86%), and staying motivated (79%) to incorporate recommended lifestyle changes. Patients were unsure of the role of a support group, with participants often replying that their family was their major source of support. Twenty-two percent of patients felt that a support group was very important to BP management.

There were mixed reports among participants in translating knowledge of hypertension-related physical consequences to changes in lifestyle behaviors. Only 44% of participants agreed that they abided to consume less fat or fewer calories (ie, weight management) to control their BP, with 44% eating home-cooked meals, 21% eating fast food, 19% admitting to eating foods high in fat, and 7% admitting to eating foods high in salt. In addition, only 56% of participants agreed that they engage in physical activity/exercise to control their BP. Thirty-seven percent never exercise, whereas 21% exercise >5 times a week.

Patient Perceived Stress

On a scale of 0 to 10, 27% of patients self-reported low stress, (0–3) 30% self-reported medium stress, (4–6) and 42% self-reported high stress. (7–10) Main causes of stress included finances (71%), home (46%), work (45%), personal life (42%), living conditions (39%), and friends (37%).

DISCUSSION

The study results suggest that patients possess the hypertension health literacy needed to control this chronic disease. However, they do not implement this literacy into lifestyle action behaviors, resulting in over half of surveyed subjects having uncontrolled hypertension ($\geq 140/90$ mm Hg). Participants' response pattern to questions revealed cognitive discrepancies. For instance, a large percentage of patients positively endorsed items including "I can control my high BP," and "I have thought about better control of my BP within the last 12 months." However, a large percentage of patients also felt strongly that "I will have complications with high BP no matter my actions." These discrepant self-report patterns were more evident in persons who endorsed strong feelings of hopelessness. That is, internalized hopelessness may be an important reason for medical noncompliance and failure to implement needed lifestyle change. Our data suggest that the magnitude of participants' self-defeating attributional style is potentially arresting their ability to strive for and achieve greater BP control adherence.

Our findings are consistent with other studies suggesting that external loci of control, such as hopelessness, are associated with poorer health.^{15–17} Jokisalo et al reported an association between high levels of hopelessness toward hypertension treatment and poorer BP control in health center patients.¹⁵ In addition, normotensive middle-aged men with high levels of generalized hopelessness at baseline were more likely than their counterparts with less hopelessness to develop hypertension 4 years later.¹⁶ Meyer et al¹⁷ showed that patients who believed that their treatment had beneficial effects on their symptoms were more adherent and had better BP control.

It is possible that the sense of hopelessness reported by patients can be both the cause and the consequence of poor BP

control. If a fully compliant patient has tried several antihypertensive medications with poor results, he/she may become frustrated and develop a hopeless attitude toward treatment. This finding highlights the need for healthcare providers to listen to patients carefully, recognize all individual treatment failures, and discuss the health benefits of treatment with patients. Hopelessness might also be the cause for poor BP control because if a patient does not believe that his/her hypertension can be controlled, it may affect his/her overall treatment behavior.

In addition, 81% of surveyed patients regularly visit a physician regarding BP management and 81% admitted to noncompliance with BP medication regimens within the last year. These results are similar to previously reported findings, demonstrating that noncompliance to prescribed hypertension therapies is commonplace. A 1982 National Heart, Lung, and Blood Institute Working Group reported that among patients who stay in care, only two thirds take their prescribed medications with frequent sufficiency to achieve BP control. Since that time, studies have provided little evidence of improved medication adherence.^{18–20} Recent studies have shown that 16% to 50% of newly diagnosed hypertensive patients discontinue their antihypertensive medication during the first year of use and that a substantial number of those who continue do so inadequately.^{21,22} Patient rationale effecting medication adherence includes normalization of BP, medication side effects, forgetfulness, and cost.²³ Patients in the current study listed finances followed by improved physical symptoms, medication side effects, and difficulty remembering to take medication as reasons for noncompliance with prescribed regimens.

Previous studies have documented the patient belief that stress and tension elevate BP.^{15,24} The current study revealed high perceived stress (42%) that is highly associated with finances. Although stress may account for only 10% of BP variance,²⁵ physicians should be sensitive to the role that stress and financial limitations may have on patient compliance and BP control. A recent study showed that both stress management and exercise help to reduce emotional distress and improve coronary heart disease risk factors such as high BP.²⁶

Approximately half of surveyed participants experience some slight psychological distress. Most of this distress presents itself through physical symptoms or somatization. Increases in depression BSI test scores have been significantly associated with lower odds of BP medication compliance.²⁷ The precise mechanism by which psychological symptoms can affect compliance is not clear and may include poor motivation, pessimism over the effectiveness of treatment, decrements in attention, memory, and cognition, decreased self-care, and even intentional self-harm.^{18,28,29}

The current study also evaluated the patient's perception of physician clinical inertia. Okonofua et al⁵ have confirmed that clinical inertia rates in hypertensive initiative sites were high with antihypertensive therapy not being intensified at 86.9% of visits when BP was $\geq 140/90$ mm Hg. Patients seen by physicians with lower clinical inertia had greater BP reductions by their last physician's visit.⁵ Patients in the current study showed overall satisfaction with their physician's BP management time and agreed that their physician quickly changed their medication regimen if their BP was not being lowered effectively. Thus, in this particular surveyed population, the patient perception of physician clinical inertia was low.

Study limitations and strengths should be considered when interpreting these PtInert findings. Because the current study evaluated the mindset behind hypertension control bar-

riers in ED patients, results may not be generalized to other populations. We hypothesize that ED patients may have higher levels of PtInert because a subset may use the ED for primary care. Although our sample size was somewhat limited, the sample size was large enough to detect relationships and tendencies of behavior. In addition, the use of facilitated self-report may have skewed patient responses. Patients may have provided answers that they perceived the study staff would view as positive. Despite these limitations, the findings suggest that a sense of hopelessness surrounding BP control may influence patient mindset of medication and lifestyle regimen compliance and provide a framework and foundation for continued study.

In summary, our study indicates that despite adequate hypertension health literacy, a sense of hopelessness surrounding successful control of hypertension complications limit action behaviors in patients with a history of hypertension who present in the ED setting. Patients visit physicians regularly for BP management but habitually do not adhere to medication regimen recommendations and lifestyle management changes, which may contribute to the high percentage of patients with uncontrolled hypertension. This study warrants further assessment of this new health paradigm model of PtInert and suggests that healthcare professionals realize that they are dealing daily with patients who possess a hopeless attitude toward their individual hypertension control.

REFERENCES

1. **Fields LE, Burt VL, Cutler JA, et al.** The burden of adult hypertension in the United States 1999 to 2000: a rising tide. *Hypertension* 2004;44:398–404.
2. **Hertz RP, Unger AN, Cornell JA, et al.** Racial disparities in hypertension prevalence, awareness, and management. *Arch Intern Med* 2005;165:2098–104.
3. **Howard G, Prineas R, Moy C, et al.** Racial and geographic differences in awareness, treatment, and control of hypertension: the REasons for Geographic And Racial Differences in Stroke study. *Stroke* 2006;37:1171–8.
4. **Cutler JA, Sorlie PD, Wolz M, et al.** Trends in hypertension prevalence, awareness, treatment, and control rates in United States adults between 1988–1994 and 1999–2004. *Hypertension* 2008;52:818–27.
5. **Okonofua EC, Simpson KN, Jesri A, et al.** Therapeutic inertia is an impediment to achieving the Healthy People 2010 blood pressure control goals. *Hypertension* 2006;47:345–51.
6. **Fine LJ, Cutler JA.** Hypertension and the treating physician: understanding and reducing therapeutic inertia. *Hypertension* 2006;47:319–20.
7. **Hajjar I, Kotchen JM, Kotchen TA.** Hypertension: trends in prevalence, incidence, and control. *Annu Rev Public Health* 2006;27:465–90.
8. **Dickinson HO, Mason JM, Nicolson DJ, et al.** Lifestyle interventions to reduce raised blood pressure: a systematic review of randomized controlled trials. *J Hypertens* 2006;24:215–33.
9. **Monane M, Bohn RL, Gurwitz JH, et al.** Compliance with antihypertensive therapy among elderly Medicaid enrollees: the roles of age, gender, and race. *Am J Public Health* 1996;86:1805–8.
10. **Costa FV.** Compliance with antihypertensive treatment. *Clin Exp Hypertens* 1996;18:463–72.
11. **Shaw E, Anderson JG, Maloney M, et al.** Factors associated with noncompliance of patients taking antihypertensive medications. *Hosp Pharm* 1995;30:201–7.
12. **Bennett NM, Shea S.** Hypertensive emergency: case criteria, sociodemographic profile, and previous care of 100 cases. *Am J Public Health* 1988;78:636–40.
13. **Tisdale JE, Huang MB, Borzak S.** Risk factors for hypertensive crisis: importance of out-patient blood pressure control. *Fam Pract* 2004;21:420–4.
14. **Morisky DE, Green LW, Levine DM.** Concurrent and predictive validity of a self-reported measure of medication adherence. *Med Care* 1986;24:67–74.
15. **Jokisalo E, Enlund H, Halonen P, et al.** Factors related to poor control of blood pressure with antihypertensive drug therapy. *Blood Press* 2003;12:49–55.
16. **Everson SA, Kaplan GA, Goldberg DE, et al.** Hypertension incidence is predicted by high levels of hopelessness in Finnish men. *Hypertension* 2000;35:561–7.
17. **Meyer D, Leventhal H, Gutmann M.** Common-sense models of illness: the example of hypertension. *Health Psychol* 1985;4:115–35.
18. **Wang PS, Bohn RL, Knight E, et al.** Noncompliance with antihypertensive medications: the impact of depressive symptoms and psychosocial factors. *J Gen Intern Med* 2002;17:504–11.
19. **Christensen DB, Williams B, Goldberg HI, et al.** Assessing compliance to antihypertensive medications using computer-based pharmacy records. *Med Care* 1997;35:1164–70.
20. **Ren XS, Kazis LE, Lee A, et al.** Identifying patient and physician characteristics that affect compliance with antihypertensive medications. *J Clin Pharm Ther* 2002;27:47–56.
21. **Düsing R, Weisser B, Mengden T, et al.** Changes in antihypertensive therapy—the role of adverse effects and compliance. *Blood Press* 1998;7:313–15.
22. **Caro JJ, Speckman JL, Salas M, et al.** Effect of initial drug choice on persistence with antihypertensive therapy: the importance of actual practice data. *CMAJ* 1999;160:41–6.
23. **Andrade JP, Vilas-Boas F, Chagas H, et al.** Epidemiological aspects of adherence to the treatment of hypertension. *Arq Bras Cardiol* 2002;79:375–84.
24. **Hekler EB, Lambert J, Leventhal E, et al.** Commonsense illness beliefs, adherence behaviors, and hypertension control among African Americans. *J Behav Med* 2008;31:391–400.
25. **Herrmann JM.** Essential hypertension and stress. When do yoga, psychotherapy and autogenic training help? *MMW Fortschr Med* 2002;144:38–41.
26. **Blumenthal JA, Sherwood A, Babyak MA, et al.** Effects of exercise and stress management training on markers of cardiovascular risk in patients with ischemic heart disease: a randomized controlled trial. *JAMA* 2006;293:1626–34.
27. **Kario K, Schwartz JE, Davidson KW, et al.** Gender differences in associations of diurnal blood pressure variation, awake physical activity, and sleep quality with negative affect: the work site blood pressure study. *Hypertension* 2001;38:997–1002.
28. **Nelson EC, Stason WB, Neutra RR, et al.** Identification of the noncompliant hypertensive patient. *Prev Med* 1980;9:504–17.
29. **Col N, Fanale JE, Kronholm P.** The role of medication noncompliance and adverse drug reactions in hospitalizations of the elderly. *Arch Intern Med* 1990;150:841–5.