Published in final edited form as:
Hypertension. 2006 November ; 48(5): 816–817.

Antihypertensive Prescribing:

Do We Have Reason to Celebrate?

Barry L. Carter
From the Division of Clinical and Administrative Pharmacy, College of Pharmacy, and Department of Family Medicine, Roy J. and Lucille A. Carver College of Medicine, University of Iowa, Iowa City, Iowa.

The blood pressure (BP) goal for Healthy People 2000 was to achieve BP control in 50% of the population with hypertension. Unfortunately, BP was only controlled in 31% in 2000.[1] When the goal was not achieved in 2000, the same goal of 50% was established in Healthy People 2010.[2] There is slightly >3 years to achieve Health People 2010. Do we have reason to be concerned with achieving this rather modest goal? One way to gauge our progress is to evaluate how well medical providers are adhering to guidelines.

There are several ways to evaluate guideline adherence, including physician surveys, chart reviews, and antihypertensive prescribing trends.[3] In addition, there are many ways to evaluate prescribing, including pharmacy databases. Some pharmacy databases have significant limitations, because they only provide data in aggregate and do not provide information about therapy for specific patients. An example would be the percentage of all of the prescriptions written for β-blockers. These studies provide information on overall prescribing trends but do not assess actual regimens being used in patients.

One of the common findings from prescribing trends demonstrates the steady decline in the use of diuretics. By the mid-1990s, most studies had found that diuretic use had declined to ≈10% of all antihypertensive prescriptions.[3] Again, it is important to recognize that this is the percentage of antihypertensive prescriptions and not that 10% of patients were receiving diuretics. Nevertheless, diuretic use dropped significantly from 1980 to 2000.

The study by Ma et al[4] in this issue of *Hypertension* is another examination of prescribing trends, but their study provides much better information than studies from pharmacy databases. These investigators used data from the National Ambulatory Medical Survey and the outpatient component of the National Hospital Ambulatory Medical Care Survey that is a validated data source used previously to evaluate antihypertensive use. The advantage of these surveys is that they provide patient-level information. There are, however, limitations to these national surveys as the authors acknowledge. One limitation is that complex patients who visit their physicians more frequently are probably oversampled. Another limitation is that the number of medications that were included in the survey increased from a maximum of 5 in 1993–1994 to 6 in 1995–2000 and to 8 in 2003–2004. Because the maximum number of medications that could be reported in 1993–1994 was 5, including diagnoses other than hypertension, there may have been underreporting for patients with complex medication regimens in 1993–1994

Correspondence to Barry L. Carter, University of Iowa, 115 South Grand Ave, Iowa City, IA 52242. E-mail barry-carter@uiowa.edu.
The opinions expressed in this editorial are not necessarily those of the editors or of the American Heart Association.

Disclosures
B.L.C. is a member of the ALLHAT investigator/educators speaker program, which is considered a modest relationship.

Sources of Funding
This work was supported by the National Heart, Lung, and Blood Institute (R01 HL069801 and R01 HL070740) and the Center for Research in the Implementation of Innovative Strategies in Practice (CRIISP), Iowa City VA Health Care System.

compared with 2003–2004. Even with these limitations, the study shows some important trends.

There is good news for those who believe that thiazide diuretics are important components of most hypertension regimens. Thiazide diuretic use increased substantially from 2000 to 2003. Presumably, these trends support the notion that physicians were following recent guidelines and clinical trial results.[2,5] There was some decline in diuretic use in 2004. These findings probably demonstrate the constant marketing pressure from the pharmaceutical industry to promote other drugs and highlight the need to continually emphasize the importance of diuretics. It will be interesting to see prescribing trends in 2005–2006 after the national dissemination programs currently being delivered by the investigator/educators from the Antihypertensive and Lipid-Lowering treatment to prevent Heart Attack Trial (ALLHAT).

Perhaps the more important finding from the study by Ma et al[4] is the fact that combination therapy increased from 48% in 1993% to 60% by 2004. The majority of these combinations included a diuretic. It seems that physicians have heard the message concerning the need to use >1 drug to achieve BP goals, which is consistent with both the Seventh Joint National Committee and ALLHAT.[2,5] These findings suggest that physicians may be treating hypertension more aggressively.

Although these prescribing trends are important findings, they do not provide insight into BP control. Is there any reason to believe that the findings by Ma et al[4] have translated into improved BP control? This question is critical, because good medication regimens may still be dosed suboptimally, and patients may still not take them as prescribed. In addition, just because a physician has high knowledge of how to treat hypertension does not mean that the patient BP control rates will be high.[6] The latter issue is likely because of clinical inertia on the part of providers, as well as patient and health system organizational barriers that are largely beyond the physician's control.

The national BP control rate of 31% in 1999–2000 and 34% in 2001–2002 are often quoted to argue that physicians are not adhering to guidelines. However, these numbers include patients who are unaware of their hypertension and many are probably not regularly seeing their physician. Data from The National Health And Nutrition Examination Surveys (NHANES) show that BP control for patients being treated was 47% in 1988–1991, 53% in 1999–2000, and 56% in 2001–2002 (Table).[7] These NHANES findings are in agreement with those from the National Committee for Quality Assurance (NCQA), which accredits managed care organizations that have found control rates of ≈57% in 2002. BP control increased to ≈65% in 2004 (Table).[8] These BP trends seem to support the findings by Ma et al.[4]

These data actually demonstrate 3 major gaps that policy-makers, health services researchers, and clinicians need to address. The first gap is the one between control rates for all patients with hypertension (40%) and those under treatment (65%). This gap is caused by patients who do not visit their physicians, patients who have gone undiagnosed, or patients who have had high BP values in the office but have not been treated. Closing this gap will require increased screening and surveillance, employer-based programs, and strategies to encourage providers to diagnose and treat patients who demonstrate high BP values in the office.

The second gap is the one between those on Medicaid (61%) and those on commercial insurance (67%). This gap may not be significant if these populations are controlled for complexity and case mix, but these data still need attention.

The third gap is the gap in BP control rates for those being treated (65%) and the maximum achievable BP control rate. Controlled clinical trials have found that BP can be controlled in 60% to 70% of patients when there is close follow-up and forced drug titration.[9,10] If 65% to

70% control is our target, then the gap for treated patients may no longer exist. However, I believe we can do much better than 70%, and quality improvement strategies that include organizational change and/or changes in the healthcare team have achieved substantial improvements in BP control, sometimes as high as 90% in primary care settings.[11,12]

I believe that these findings are indeed reason to celebrate but also reason to redouble our efforts. If, in fact, hypertension control in 2004 was >40% for all patients with hypertension and >65% for those being treated, there is hope that the Healthy People 2010 goals for hypertension can be achieved.

References

1. Hajjar I, Kotchen TA. Trends in prevalence, awareness, treatment, and control of hypertension in the United States, 1988–2000. JAMA 2003;290:199–206. [PubMed: 12851274]
2. Chobanian AV, Bakris GL, Black HR, Cushman WC, Green LA, Izzo JL Jr, Jones DW, Materson BJ, Oparil S, Wright JT Jr, Roccella EJ. the National High Blood Pressure Education Program Coordinating Committee. Seventh report of the Joint National Committee on Prevention, Detection, Evaluation, and Treatment of High Blood Pressure. Hypertension 2003;42:1206–1252. [PubMed: 14656957]
3. Milchak JL, Carter BL, James PA, Ardery G. Measuring adherence to practice guidelines for the management of hypertension: an evaluation of the literature. Hypertension 2004;44:602–608. [PubMed: 15381676]
4. Ma J, Lee K-V, Stafford RS. Changes in antihypertensive prescribing during US outpatient visits for uncomplicated hypertension between 1993 and 2004. Hypertension 2006;48:•••–•••.
5. ALLHAT Officers and Coordinators for the ALLHAT Collaborative Research Group. Major outcomes in high-risk hypertensive patients randomized to angiotensin-converting enzyme inhibitor or calcium channel blocker vs diuretic: the Antihypertensive and Lipid-Lowering Treatment to Prevent Heart Attack Trial (ALLHAT). JAMA 2002;288:2981–2997. [PubMed: 12479763]
6. Carter BL, Hartz A, Bergus G, Dawson JD, Doucette WR, Stewart JJ, Xu Y. Relationship between physician knowledge of hypertension and blood pressure control. J Clin Hypertens 2006;8:481–486.
7. Cheung BM, Ong KL, Man YB, Lam KS, Lau CP. Prevalence, awareness, treatment, and control of hypertension: United States National Health and Nutrition Examination Survey 2001–2002. J Clin Hypertens 2006;8:93–98.
8. The National Committee for Quality Assurance. The state of health care quality 2005. Washington, DC: The National Committee for Quality Assurance; 2006. [Accessed July 12, 2006]. http://www.ncqa.org
9. Black HR, Elliott WJ, Neaton JD, Grandits G, Grambsch P, Grimm RH Jr, Hansson L, Lacouciere Y, Muller J, Sleight P, Weber MA, White WB, Williams G, Wittes J, Zanchetti A, Fakouhi TD, Anders RJ. Baseline characteristics and early blood pressure control in the CONVINCE Trial. Hypertension 2001;37:12–18. [PubMed: 11208750]
10. Grimm RH Jr, Margolis KL, Papademetriou VV, Cushman WC, Ford CE, Bettencourt J, Alderman MH, Basile JN, Black HR, DeQuattro VV, Eckfeldt J, Hawkins CM, Perry HM Jr, Proschan M. Baseline characteristics of participants in the Antihypertensive and Lipid Lowering Treatment to Prevent Heart Attack Trial (ALLHAT). Hypertension 2001;37:19–27. [PubMed: 11208751]
11. Walsh JM, McDonald KM, Shojania KG, Sundaram V, Nayak S, Lewis R, Owens DK, Goldstein MK. Quality improvement strategies for hypertension management: A systematic review. Med Care 2006;44:646–657. [PubMed: 16799359]
12. Carter BL, Zillich AJ, Elliott WJ. How pharmacists can assist physicians with controlling blood pressure. J Clin Hypertens 2003;5:31–37.

Blood Pressure Control Rates for Treated Patients: 2000 –2004

NHANES Data[7]		NCQA Data[8]		
Year	**Rate**	**Commercial Insurance**	**Medicare**	**Medicaid**
2000	53.1	51.5	46.7	45.4
2001	56.1	55.4	53.6	53.0
2002	56.1	58.4	56.9	53.4
2003	N/A	62.2	61.4	58.6
2004	N/A	66.8	64.6	61.4

N/A indicates not available at this time.