



Hypertension Control



ACTION STEPS
for Clinicians

Acknowledgments

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To reduce the burden of heart attack and stroke in the United States, the Department of Health and Human Services launched Million Hearts®. The goal of this initiative is to prevent one million heart attacks and strokes by 2017 by implementing proven and effective interventions in clinical settings and communities. Million Hearts® brings together communities, health systems, nonprofit organizations, federal agencies, and private-sector partners from across the country to fight heart disease and stroke.

High blood pressure is one of the leading causes of heart disease and stroke.¹ One in every three U.S. adults (67 million) has high blood pressure, and only about half of these individuals have their condition under control.² Of the 36 million

Americans who have uncontrolled hypertension, most have a usual source of care (89.4%), received medical care in the previous year (87.7%), and have health insurance (85.2%).³

The purpose of this document is to deliver tested strategies for busy clinicians to aid in efforts related to hypertension control. These strategies were gathered from the published scientific literature (evidence-based) or found to be effective in clinical settings (practice-based). The strategies are organized into three categories of actions to improve delivery system design (Table 1), improve medication adherence (Table 2), and optimize patient reminders and supports (Table 3). This document contains additional resources and references where more information can be found for each action step.

Strategies for Hypertension Control

Table 1. Actions to Improve Delivery System Design
Implement a standardized hypertension treatment protocol. ⁴ ▶ Support titration of hypertension medications by clinical team members via a physician-approved protocol. ^{5,6}
Designate hypertension champions within your practice or organization. ⁷
Proactively track and contact patients whose blood pressure is uncontrolled using an electronic health record (EHR)-generated list, patient registry, or other data source. ⁷⁻⁹
Create a blood pressure measurement station where all patients can rest quietly for 5 minutes before measurement and that is designed to support proper measurement techniques (e.g., feet on floor, proper arm position, multiple cuff sizes conveniently located). ⁹
Have care team members review a patient's record before the office visit to identify ways to improve blood pressure control. ⁷
Proactively provide ongoing support for patients with hypertension through office visits or other means of contact until blood pressure is controlled. ¹⁰
Implement systems to alert physicians about patterns of high blood pressure readings taken by support staff. ^{11,12} ▶ Place a sign or magnet on the outside of the examination room. ▶ Build clinical decision supports into the EHR.
Provide feedback to individual clinicians and clinic sites on their hypertension control rates. Provide incentives for high performance, and recognize high performers. ⁴
Provide blood pressure checks without a copayment or appointment. Train clerical personnel in proper blood pressure measurement technique so they are capable of obtaining drop-in blood pressure readings. ^{4,13}
Encourage clinicians to take continuing education on hypertension management and care of resistant hypertension. ^{4,14}

Table 2. Actions to Improve Medication Adherence

Encourage patients to use medication reminders.^{15–18}

- ▶ Promote pill boxes, alarms, vibrating watches, and smartphone applications.

Provide all prescription instructions clearly in writing and verbally.¹⁹

- ▶ Limit instruction to 3–4 major points.
- ▶ Use plain, culturally sensitive language.
- ▶ Use written information or pamphlets and verbal education at all encounters.

Ensure patients understand their risks if they do not take medications as directed. Ask patients about these risks, and have patients restate the positive benefits of taking their medications.¹⁹

Discuss with patients potential side effects of any medications when initially prescribed and at every office visit thereafter.²⁰

Provide rewards for medication adherence.²¹

- ▶ Praise adherence.
- ▶ Arrange incentives, such as coupons, certificates, and reduced frequency of office visits.

Prescribe medications included in the patient's insurance coverage formulary, when possible.²²

Prescribe once-daily regimens or fixed-dose combination pills.^{23–26}

Assign one staff person the responsibility of managing medication refill requests.²⁷

- ▶ Create a refill protocol.

Implement frequent follow-ups (e.g., e-mail, phone calls, text messages) to ensure patients adhere to their medication regimen.^{15,28–30}

- ▶ Set up an automated telephone system for patient monitoring and counseling.

Table 3. Actions to Optimize Patient Reminders and Supports

Provide patients who have hypertension with a written self-management plan at the end of each office visit.^{12,31}

- ▶ Encourage or provide patient support groups.
- ▶ Use all staff interactions with patients as opportunities to assist in self-management goal-setting and practices.
- ▶ Print visit summaries and follow-up guidance for patients.

Generate lists of patients with hypertension who have missed recent appointments. Send phone, mail, e-mail, or text reminders.¹³

Contact patients to confirm upcoming appointments, and instruct them to bring medications, a medication list, and home blood pressure readings with them to the visit.⁷

Send a postcard to or call patients who have not had their blood pressure checked recently. Invite them to drop in to have their blood pressure checked by a medical assistant, nurse, or other trained personnel without an appointment and at no charge.¹²

Send patients text messages about taking medications, home blood pressure monitoring, or scheduled office visits.³⁰

Encourage patients to use smartphone or Web-based applications to track and share home blood pressure measurements.^{32,33}

Encourage home blood pressure monitoring plus clinical support using automated devices with a properly sized arm cuff.^{7,34,35}

- ▶ Advise patients on choosing the best device and cuff size.
- ▶ Check patients' home monitoring devices for accuracy.
- ▶ Train patients on proper use of home blood pressure monitors.

Implement clinical support systems that incorporate regular transmission of patients' home blood pressure readings and customized clinician feedback into patient care.³⁵

- ▶ Train staff to administer specific clinical support interventions (e.g., telemonitoring, patient portals, counseling, Web sites).
- ▶ Incorporate regular transmission of patient home blood pressure readings through patient portals, telemonitoring, log books, etc., to clinicians and EHR systems.
- ▶ Provide regular customized support and advice (e.g., medication titration, lifestyle modifications) based on patient blood pressure readings.

Resources

Resources for Delivery System Design

[American Academy of Family Physicians](#). Using a Simple Patient Registry to Improve Your Chronic Disease Care.

[American Medical Group Foundation](#). Provider Toolkit to Improve Hypertension Control.

[Centers for Disease Control and Prevention](#). Protocol for Controlling Hypertension in Adults.

[Washington State Department of Health](#). Improving the Screening, Prevention, and Management of Hypertension—An Implementation Tool for Clinical Practice Teams.

Resources for Medication Adherence

[American Academy of Family Physicians](#). Improving Patient Care: Rethinking Refills.

[American College of Preventive Medicine](#). Medication Adherence Time Tool: Improving Health Outcomes.

[Centers for Disease Control and Prevention](#). Medication Adherence Educational Module.

[Script Your Future](#). Adherence Tools.

[Surescripts](#). Clinician's Guide to e-Prescribing: 2011 Update.

Resources for Patient Reminders and Supports

[Agency for Healthcare Research and Quality](#). Electronic Preventive Services Selector (ePSS).

[American Heart Association](#). Heart360. An Online Tool for Patients to Track and Manage Their Heart Health and Share Information with Healthcare Providers.

[Institute for Healthcare Improvement](#). Partnering in Self-Management Support: A Toolkit for Clinicians.

References

1. Frieden TR, Berwick DM. The "Million Hearts" initiative—preventing heart attacks and strokes. *N Engl J Med*. 2011;365:e27.
2. Valderrama AL, Gillespie C, King SC, George MG, Hong Y, Gregg E. Vital signs: awareness and treatment of uncontrolled hypertension among adults—United States, 2003–2010. *MMWR*. 2012;61:703–9.
3. Gillespie C, Kuklina EV, Briss PA, Blair NA, Hong Y. Vital signs: prevalence, treatment, and control of hypertension—United States, 1999–2002 and 2005–2008. *MMWR*. 2011;60(04):103–8.
4. Jaffe M, Lee G, Young J, Sidney S, Go A. Improved blood pressure control associated with a large-scale hypertension program. *JAMA*. 2013;310(7):699–705.
5. Centers for Disease Control and Prevention. *Field Notes: Kaiser Permanente Colorado Hypertension Management Program*. Atlanta, GA: Centers for Disease Control and Prevention, US Dept of Health and Human Services; 2013.
6. Curzio JL, Rubin PC, Kennedy SS, Reid JL. A comparison of the management of hypertensive patients by nurse practitioners compared with conventional hospital care. *J Hum Hypertens*. 1990;4(6):665–70.
7. Health Resources and Services Administration. *Hypertension Control*. Washington, DC: Health Resources and Services Administration, US Dept of Health and Human Services; 2012. www.hrsa.gov/quality/toolbox/508pdfs/hypertensioncontrol.pdf. Accessed October 30, 2013.
8. Burke W, Nelson K, Caulin-Glaser T, Snow R. Use of hypertension registry to identify patients at high risk for cardiovascular events caused by metabolic syndrome. *Ost Fam Phys*. 2010;2(10):124–30.
9. Chobanian AV, Bakris GL, Black HR, Cushman WC, Green LA, Izzo JL Jr, et al.; National Heart, Lung, and Blood Institute Joint National Committee on Prevention, Detection, Evaluation, and Treatment of High Blood Pressure; National High Blood Pressure Education Program Coordinating Committee. The Seventh Report of the Joint National Committee on Prevention, Detection, Evaluation, and Treatment of High Blood Pressure: the JNC 7 report. *JAMA*. 2003;289(19):2560–72.

10. McClellan W, Hall D, Brogan D, Miles C, Wilber J. Continuity of care in hypertension: an important correlate of blood pressure control among aware hypertensives. *Arch Intern Med.* 1988;148(3):525–8.
11. Roumie CL, Elasy TA, Greevy R, Griffin MR, Liu X, Stone WJ, et al. Improving blood pressure control through provider education, provider alerts, and patient education: a cluster randomized trial. *Ann Intern Med.* 2006;145(3):165–75.
12. Tashjian C. Making meaningful use of meaningful use: combining medicine and technology to improve quality and transform healthcare [PowerPoint slides]. Vital Signs Town Hall; September 4, 2012.
13. Bass M, McWhinney IR, Donner A. Do family physicians need medical assistants to detect and manage hypertension? *CMAJ.* 1986;134(11):1247–55.
14. Gullion D, Tschann J, Adamson E, Coates T. Management of hypertension in private practice: a randomized controlled trial in continuing medical education. *J Contin Educ Health Prof.* 1988;4(8):239–55.
15. Agency for Healthcare Research and Quality. *Medication Adherence Interventions: Comparative Effectiveness. Closing the Quality Gap: Revisiting the State of the Science.* Evidence Report/Technology Assessment No. 208. 2012. www.effectivehealthcare.ahrq.gov/ehc/products/296/1248/EvidenceReport208_CQGMedAdherence_FinalReport_20120905.pdf. Accessed September 5, 2013.
16. Connor J, Rafter N, Rodgers A. Do fixed-dose combination pills or unit-of-use packaging improve adherence? A systematic review. *Bull World Health Organ.* 2004;82(12):935–9.
17. Fenerty S, West C, Davis S, Kaplan S, Feldman S. The effect of reminder systems on patients' adherence to treatment. *Patient Prefer Adherence.* 2012;6:127–35.
18. Becker L, Glanz K, Sobel E, Mossey J, Zinn S, Knott KA. A randomized trial of special packaging of antihypertensive medication. *J Fam Pract.* 1986;22:357–61.
19. Domino FJ. Improving adherence to treatment for hypertension. *Am Fam Physician.* 2005;71(11):2089–90.
20. Brown M, Bussell J. Medication adherence: who cares? *Mayo Clin Proc.* 2011;86(4):304–14.
21. Krousel-Wood M, Hyre A, Munter P, Morisky D. Methods to improve medication adherence in patients with hypertension: current status and future directions. *Curr Opin Cardiol.* 2005;20(4):296–300.
22. Fischer M, Vogeli C, Stedman M, Ferris T, Brookhart A, Weissman J. Effect of electronic prescribing with formulary decision on medication use and cost. *Arch Intern Med.* 2008;168(22):2433–9.
23. Schroeder K, Fahey T, Ebrahim S. Interventions for improving adherence to treatment in patients with high blood pressure in ambulatory settings. *Cochrane Database Syst Rev.* 2004;(2):CD004804.
24. Iskedjian M, Einarson TR, MacKeigan LD, Shear N, Addis A, Mittmann N, et al. Relationship between daily dose frequency and adherence to antihypertensive pharmacotherapy: evidence from a meta-analysis. *Clin Ther.* 2002;24:302–16.
25. Skaer TL, Sclar DA, Robison LM, Chin A, Gill MA, Okamoto MP, et al. Effect of pharmaceutical formulation for antihypertensive therapy on health service utilization. *Clin Ther.* 1993;15(4):715–25.
26. Claxton A, Cramer J, Pierce C. A systematic review of the association between dose regimens and medication compliance. *Clin Ther.* 2001;23(8):1296–310.
27. American Academy of Family Physicians. Practice pearls. *Fam Pract Manag.* 2008;15(3):42. www.aafp.org/fpm/2008/0300/p42.html. Accessed September 5, 2013.
28. Patton K, Meyers J, Lewis BE. Enhancement of compliance among patients with hypertension. *Am J Manag Care.* 1997;3(11):1693–8.
29. Friedman RH, Kazis LE, Jette A, Smith MB, Stollerman J, Torgerson J, et al. A telecommunications system for monitoring and counseling patients with hypertension. Impact on medication adherence and blood pressure control. *Am J Hypertens.* 1996;9:285–92.
30. Fisher HH, Moore SL, Ginosar D, Davidson AJ, Rice-Peterson CM, Durfee MJ, et al. Care by cell phone: text messaging for chronic disease management. *Am J Manag Care.* 2012;18(2):e42–7.
31. Chodosh J, Morton S, Walter M, Maglione M, Suttrop MJ, Hilton L, et al. Meta-analysis: chronic disease self-management programs for older adults. *Ann Intern Med.* 2005;143(6):427–38.

32. Logan A, Irvine M, Mclsaac W, Tisler A, Rossos PG, Easty A, et al. Effect of home blood pressure telemonitoring with self-care support on uncontrolled systolic hypertension in diabetics. *Hypertension*. 2012;60:51–7.
33. Magid D, Olson K, Billups S, Wagner N, Lyons E, Kroner B. A pharmacist-led, American Heart Association Heart 360 web-enabled home blood pressure monitoring program. *Circ Cardiovasc Qual Outcomes*. 2013;6:157–63.
34. Williams JS, Brown SM, Conlin PR. Videos in clinical medicine. Blood-pressure measurement. *N Engl J Med*. 2009;360(5):e6.
35. Centers for Disease Control and Prevention. *Self-Measured Blood Pressure Monitoring: Action Steps for Public Health Practitioners*. Atlanta, GA: Centers for Disease Control and Prevention, US Dept of Health and Human Services; 2013.



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