

Improve blood pressure control in your practice

## MEASURE ACCURATELY AND PROMOTE SELF-MEASURED BLOOD PRESSURE MONITORING AT HOME

As a component of the American Medical Association's **Improving Health Outcomes: Blood Pressure program**, the following guidance is for use by physician office practices and health centers. The goal is threefold: (1) to help increase clinician understanding of the importance and opportunities associated with self-measured blood pressure monitoring (SMBP); (2) to increase patient participation in the management of their own blood pressure (BP), including reporting their BP measurements back to their physician; and (3) to reinforce the need to achieve accurate BP measurements in *all* settings—both at the point of care as well as off site as part of a coordinated SMBP effort.

Supplementary resources entitled “How to check a home blood pressure monitor for accuracy” and “Clinical competency: Self-monitoring blood pressure at home” are available on your local Blue Cross Blue Shield plan’s provider website.

### The availability of insurance benefits for home blood pressure monitoring devices

While many public and private health insurance plans do not cover the cost of self-monitoring devices, a few programs exist to provide patients with self-monitoring devices at little to no cost, including the Hypertension Management Program for enrollees in the Blue Cross and Blue Shield Federal Employee Program<sup>®</sup>. There may also be community programs available to particular populations of patients. Some insurance companies offer care management programs, such as case management and disease management, to assist members in managing their condition. The clinicians in these programs may also be resources for assistance in locating community-based programs providing blood pressure monitors at little to no cost to the patient.

## Measuring blood pressure accurately—every time and in all settings

The importance of accurate blood pressure measurement cannot be overstated with regard to diagnosing or treating hypertension.

Accurate measurement technique requires training and skill building, but a few common problems related to patient preparation and positioning often account for unreliable readings.<sup>1,2</sup> The following table shows several common problems that can cause inaccurate blood pressure measurement in any setting:

| When the patient has ...    | Blood pressure can change by an estimated* ... |
|-----------------------------|--|
| Crossed legs                | 2–8 mm Hg <sup>3</sup>                         |
| Cuff over clothing          | 5–50 mm Hg <sup>4</sup>                        |
| Cuff too small              | 2–10 mm Hg <sup>4</sup>                        |
| Full bladder                | 10 mm Hg <sup>4</sup>                          |
| Talking or active listening | 10 mm Hg <sup>4</sup>                          |
| Unsupported arm             | 10 mm Hg <sup>3,4</sup>                        |
| Unsupported back/feet       | 6.5 mm Hg <sup>4</sup>                         |

\* These values are not cumulative.

### Disclaimer

This guidance to the patient should be individualized by the clinician and reinforced by clinical staff at the initiation of any self-measured blood pressure monitoring program. Always make sure patients know what to do should they have a blood pressure measurement that is outside the pre-determined acceptable range or if they experience any symptoms with a high or low blood pressure measurement, including seeking emergency treatment if appropriate.



## **Implement a standardized process: Ensure blood pressure is measured accurately for each patient**

Steps to include are:

- Use a validated, automated device to measure BP.<sup>5</sup>
- Ask the patient “Do you need to use the bathroom?” and allow him/her to do so if needed prior to measurement.<sup>3</sup>
- Use the correct cuff size for the patient’s arm.<sup>3</sup>
- Ensure the patient is properly positioned<sup>3</sup>:
  - Seated in a chair with the back supported
  - Legs uncrossed
  - Feet flat on the ground or supported by a foot stool
  - The blood pressure cuff placed mid-arm, just above the elbow with the arm supported so that the arm and cuff are at the level of the patient’s heart
- Do not allow the patient to talk, use the phone, text or email during the procedure.
- Clinical staff and any family that may be present should also not talk in the room during the procedure.

For additional information about improving blood pressure control in your clinic, please review the AMA’s free CME module “[Improving blood pressure control](#)” on the AMA [Steps Forward website](#). Learn how implementing three simple, evidence-based interventions can help improve blood pressure control for your patients.

## **What does self-measured blood pressure success look like?**

For the practice or health care team looking to refine or add a SMBP component to care delivery, your objectives must include educating patients on how to obtain accurate BP measurements outside of the clinical setting, and empowering patients to report these to the physician or practice in an accurate, timely fashion.

To achieve these goals it is important to establish an office process for engaging patients in self-measurement that includes:

- Training staff to train patients to self-measure blood pressure
- Educating patients on hypertension
- Measuring blood pressure accurately in office and off site
- Mapping out protocols that guide patients to communicate blood pressures back to the care team

Home-based SMBP is useful in hypertension management for several reasons:

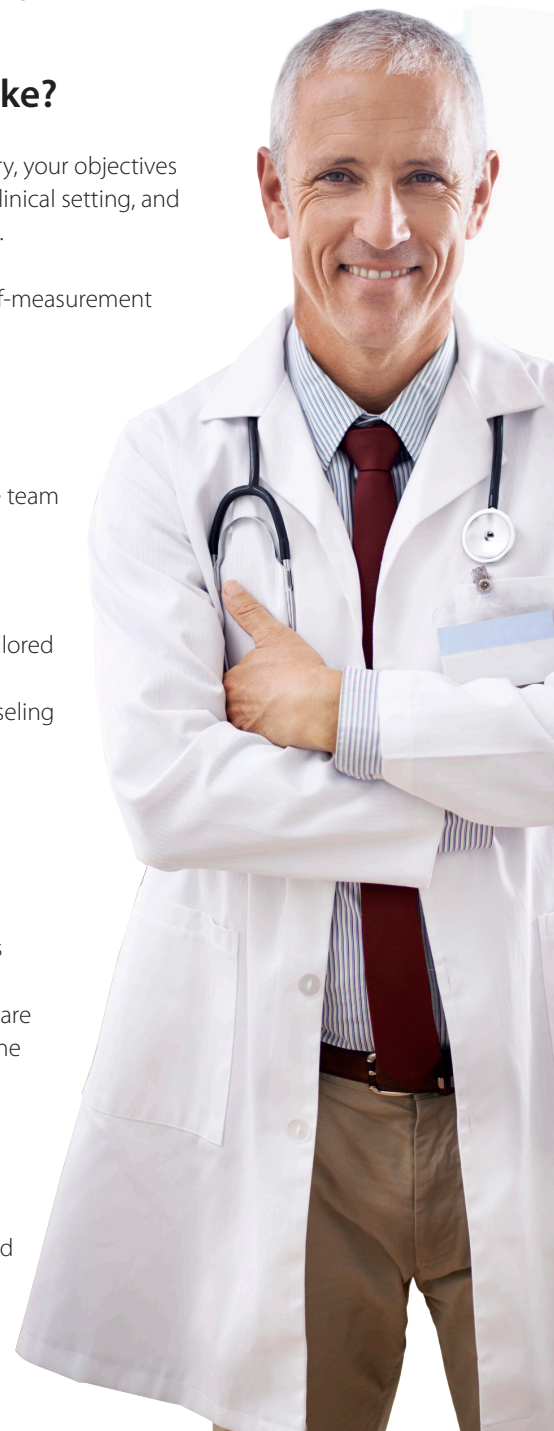
- Improves medication adherence and health outcomes for patients with hypertension<sup>6,7</sup>
- Improves BP control when a patient-to-clinician feedback loop is established and provides tailored support and advice based on the patient’s data<sup>6</sup>
  - Examples include telemonitoring with counseling, pharmacist counseling, remote counseling from a nurse or lifestyle counseling<sup>8</sup>
- Increases aggressiveness of use of pharmacotherapy<sup>9</sup> and helps reduce therapeutic inertia
- Offers greater convenience than 24-hour ambulatory BP monitoring<sup>10</sup>

## **Important considerations to keep in mind: Diagnosing hypertension**

When patients have elevated blood pressures in the office and the diagnosis of hypertension is suspected, SMBP can be extremely useful in differentiating between “white coat” hypertension and sustained hypertension. White coat hypertension occurs when a patient’s blood pressures are persistently elevated in the office setting and blood pressure measurements taken outside of the office are normal.

Masked hypertension occurs when office blood pressures are normal, but out-of-office blood pressures are elevated.

To increase the chance of diagnosing a patient suspected of having either white coat or masked hypertension, it is best to use multiple out-of-office readings over time. This is due to variability in blood pressure over time. There is one protocol for SMBP at home that is widely accepted and used in many national and international guidelines.<sup>11</sup>



- Patients should take two blood pressure measurements with a validated automated upper arm device (one minute apart) each morning and each evening with a goal of collecting these measurements for seven days (with a minimum of three days being acceptable)
- Calculate the average of all of the measured systolic and diastolic blood pressures into a single systolic and single diastolic blood pressure
- If the average systolic blood pressure (SBP)  $\geq 135$  mm Hg or diastolic blood pressure (DBP)  $> 85$  mm Hg, then the patient meets the criteria for hypertension
- If the diagnosis of hypertension, white coat hypertension or masked hypertension remains uncertain, use of 24-hour ambulatory blood pressure monitoring (ABPM) is recommended

### **Data analysis: Communication of self-measured blood pressures from home back to clinician's office for interpretation found most effective**

There are several ways for patients to communicate home blood pressure measurements back to the clinical team:

- Phone measurements to office to an assigned staff member
- Fax measurements via secure number
- Send measurements online through the facility's secure patient portal
- Send the measurements online through a secure telemedicine site
- If blood pressure device has memory capability, the patient can bring the device to the office for staff to review or download
- Patient can return for a scheduled follow-up visit after SMBP is completed

Each clinician's office should analyze the process it uses to have patients communicate SMBP readings. Inform patients how and when you will respond to their communications and what the patient should do in the event of a concerning blood pressure reading, particularly if the office is not able or does not intend to respond immediately.

### **Documentation: The average SMBP measurement from home should be entered in patient's health record**

All of the individual blood pressure measurements performed by the patient should be averaged weekly into a single systolic and diastolic blood pressure that will be used to determine the diagnosis and/or guide treatment.

- Document the average systolic and diastolic BP values in the patient's electronic health record.

## **References**

1. Williams JS, Brown SM, Conlin PR. Blood-Pressure Measurement. *N Engl J Med*. 2009;360(5):e6.
2. Ogedegbe G, Pickering T. Principles and techniques of blood pressure measurement. *Cardiol Clin*. 2010 Nov;28(4):571-86.
3. Pickering. et al. Recommendations for Blood Pressure Measurement in Humans and Experimental Animals Part 1: Blood Pressure Measurement in Humans. *Circulation*. 2005;111: 697-716.
4. Handler J. The importance of accurate blood pressure measurement. *The Permanente Journal*. Summer 2009/ Volume 13 No. 3 51.
5. Campbell NR, Berbari AE, Cloutier L, et al. Policy statement of the world hypertension league on noninvasive blood pressure measurement devices and blood pressure measurement in the clinical or community setting. *J Clin Hypertens*. 2014;16(5): 320-322.
6. Centers for Disease Control and Prevention Self-Measured Blood Pressure Monitoring: Action Steps for Public Health Practitioners, GA: Centers for Disease Control and Prevention, U.S. Dept. of Health and Human Services; 2013.
7. Bosworth HB, Powers BJ, Olsen MK, et al. Home blood pressure management and improved blood pressure control: Results from a randomized controlled trial. *Arch Intern Med*. 2011;171: 1173-1180.
8. McManus J, Mant J, Bray EP, et al. Telemonitoring and self-management in the control hypertension (TASMINH2): a randomized controlled trial. *Lancet*. 2010; 376:163-172.
9. Omboni S, Gazzola T, Carabelli G, Parati, G. Clinical usefulness and cost effectiveness of home blood pressure telemonitoring: Meta-analysis of randomized controlled studies. *J Hypertension*. 2013;31:455-467.
10. Pickering TG, Miller NH, Ogedegbe G, Krakoff LR, Artinian NT, Goff D. Call to action on use and reimbursement for home blood pressure monitoring: A Joint Scientific Statement from the American Heart Association, American Society of Hypertension, and Preventive Cardiovascular Nurses Association. *Hypertension*. 2008;52:10-29.
11. Niiranen TJ, Johansson JK, Reunanen A, Jula AM. Optimal schedule for home blood pressure measurement based on prognostic data. *Hypertension*. 2011;57:1081-1088.

**Suggested citation:** Improving Health Outcomes: Blood Pressure. Murakami L and Rakotz M.

Improve blood pressure control in your practice: Measure accurately and promote self-measured monitoring at home. 1st ed. Hertzberg M and Johnson S, eds. American Medical Association; May 2016.