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USING OUT-OF-OFFICE BLOOD PRESSURE MEASUREMENT TO IMPROVE THE DIAGNOSIS, MANAGEMENT, AND CONTROL OF HYPERTENSION

- Out-of-office blood pressure (BP) monitoring can improve the diagnosis, management, and control of hypertension (HTN).
- Incorporate out-of-office BP monitoring into your practice by
 - identifying patients for whom out-of-office BP monitoring is appropriate,
 - choosing the monitoring method best for them,
 - teaching patients who will self-monitor how to measure their BP correctly, and
 - using the full complement of in-office and out-of-office BP readings in your decision making regarding the diagnosis and treatment of HTN.

Hypertension (HTN) is a significant risk factor for heart attack, stroke, heart failure, and chronic kidney disease. Control of HTN is a key factor in preventing related morbidity and mortality, which not only affect large numbers of New Yorkers but also have disproportionate effects across different groups.

In 2020, more than one-quarter (26%) of New York City (NYC) adults reported having been told they have HTN, with Black and Latino/a adults reporting a higher prevalence (unpublished data, NYC Department of Health and Mental Hygiene [DOHMH]). Similar health inequities are evident in rates of premature death from heart disease and stroke. In 2018, approximately 3000 premature deaths from heart disease and stroke occurred in adults aged 18 to 64 years (unpublished data, NYC DOHMH). The rate of premature death from heart disease was 2.2 times higher for Black adults than for White adults, and the rates of premature death from stroke were 3.2 and 1.8 times higher for Black and Latino adults, respectively, than for White adults (unpublished data, NYC DOHMH). The COVID-19 pandemic has further burdened communities that were already disproportionately affected by chronic disease.¹

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Image courtesy of Target BP

Although such demographic statistics are commonly used to highlight health inequities, race and ethnicity are social, not biological, constructs.² Structural and institutional racism, not race, influence the distribution of social and environmental conditions needed for health, with mounting evidence implicating the effect of toxic stress on an individual's blood pressure risk.³ The NYC Board of Health has declared racism a public health crisis.⁴ The [Surgeon General's Call to Action to Control Hypertension](#) emphasizes how differences in opportunities for good health and access to quality health care can lead to inequities in the prevalence and impact of HTN.¹

Help reduce inequitable health outcomes in hypertension and related conditions by ensuring that all patients receive an accurate diagnosis and monitoring to improve and maintain blood pressure control. The NYC DOHMH recommends adopting and integrating out-of-office blood pressure (BP) monitoring to help support your patients in optimizing the control of HTN.

BENEFITS OF OUT-OF-OFFICE BLOOD PRESSURE MONITORING

BP varies throughout the day and night and in different settings. Multiple measurements obtained out of the office are more closely linked to risk of cardiovascular events than in-office measurements.^{5,6} Thus, relying on in-office measurements alone not only may result in an incorrect diagnosis and over- or undertreatment but also does not fully assess risk of cardiovascular disease (CVD).⁵⁻⁸ Further, out-of-office BP monitoring can support patient engagement and self-management in the treatment of HTN.^{5,7} Mounting evidence shows that when combined with feedback loops such as titration of medication and lifestyle counseling, self-monitoring can help improve BP for people of all races and ethnic groups.^{5,8}

Out-of-office BP monitoring may also help reduce the risk of syncope and falls. Individuals with HTN who are taking antihypertensive medications and whose systolic BP is below 110 mm Hg are at greater risk for serious falls and syncope.⁹ These detrimental effects are especially problematic for older adults, who may experience adverse events such as a hip fracture or brain injury (eg, subdural or subarachnoid hemorrhage).⁹

TYPES OF OUT-OF-OFFICE MONITORING

The 2 types of out-of-office BP monitoring are ambulatory BP monitoring (ABPM) and self-monitoring of BP (SMBP). Both types of monitoring use automated, validated oscillometric devices with an appropriately sized cuff for the patient's upper arm.^{5,6} If you do not provide ABPM, patients may need a referral to a specialist; SMBP does not require a referral. With ABPM, a wearable device is programmed to measure BP automatically at set intervals during normal daily activities and sleep. SMBP may be performed by the patient using an automated device in the home (home BP monitoring, or HBPM) or in settings outside the home (eg, at kiosks with BP-monitoring devices and an appropriately sized cuff, or at pharmacies). When the use of an upper arm cuff is not feasible for SMBP, validated wrist cuffs can be used to estimate BP, with special attention to technique. See [Using a Wrist Cuff to Measure Blood Pressure](#) for guidance. In some situations, BP may be measured in the home by a visiting provider.⁵

Choose the monitoring method according to the clinical scenario and patient factors (**Boxes 1⁵** and **2¹⁰⁻¹²**).

SELECTING A BP MONITORING DEVICE

Validation

Although all BP monitors, including wrist monitors, have been cleared by the FDA as being as safe and effective as similar devices, manufacturers are not required to validate the measurement accuracy of their devices.¹³ Further, the quality of data validating the performance of devices against the gold standard mercury sphygmomanometer varies.¹³ To ensure that the BP monitors you or your patients are using have been validated according to recognized standards, refer to the [United States \(US\) Blood Pressure Validated Device Listing](#).

Accuracy

Even a validated BP monitor may not be accurate in all patients.¹³ If you suspect that a patient's device may not be accurate, consider testing it against a properly maintained office BP monitor. See [SMBP Device Accuracy Test](#) for guidance.

INTERPRETING OUT-OF-OFFICE BP MEASUREMENTS

The **Table**⁸ provides the HBPM and ABPM values that correspond to office BP values. The term HBPM is used here because relevant studies did not include other methods, such as a pharmacy

kiosk. For example, for an office cutoff of 130/80 mm Hg to diagnose HTN, you would use row 2 in the **Table** to identify the corresponding value for the out-of-office BP measurement modality your patient is using. For more information on how to use office and out-of-office BP values to diagnose

BOX 1. DIFFERENCES BETWEEN ABPM AND SMBP⁵

ABPM

- Wearable device obtains measurements automatically
 - typically over a 24-hour period
 - on a programmed schedule (eg, every 15-60 min)
 - while the patient is awake and asleep
 - during daily activities
- Patients do not see or record the measurements but do need to submit a sleep diary
- A summary report is automatically generated and includes multiple BP metrics:
 - average BP during the awake or daytime period
 - average BP during the asleep or nighttime period
 - average BP during the 24-hour period
 - nocturnal BP dipping

SMBP

- Patient activates device to obtain measurements^a
 - over several days to weeks
 - ≥2 times daily (eg, morning, evening) with 2 readings on each occasion
 - while patient is awake^b
 - at rest
- Patient can see all the measurements and may need to record depending on device features
- Some devices are Bluetooth® enabled and can automatically upload readings to a Web server
- Patient requires instruction on proper placement of cuff and communicating measurements back to care team, unless device automatically transmits them
(Resources for Patients)

ABPM, ambulatory blood pressure monitoring; BP, blood pressure; SMBP, self-monitoring of blood pressure

^aMay be fully automated (multiple measurements with 1 activation) or semi-automated (1 measurement per activation)

^bSome newer models can be programmed to measure BP during sleep automatically

NOTE: Insurance coverage and requirements may vary

BOX 2. RELEVANT ICD-10 AND CPT CODES¹⁰⁻¹²

ICD-10 Codes

- **R03.0:** Elevated BP reading without diagnosis of hypertension
- **I10:** Primary (essential) hypertension

CPT Codes

ABPM

- **93784** (recommended global code):
ABPM, utilizing report-generating software, automated, worn continuously for 24 hours or longer; includes recording, scanning analysis, interpretation, and report
- **93786:** Recording only
- **93788:** Scanning analysis with report
- **93790:** Review with interpretation and report

SMBP

- **99473:** SMBP using a device validated for clinical accuracy; patient education/training and device calibration (can be submitted only once per device)
- **99474:** SMBP using a device validated for clinical accuracy; separate self-measurements of 2 readings, 1 minute apart, twice daily over a 30-day period (minimum of 12 readings); collection of data reported by the patient and/or caregiver to the physician or other qualified healthcare professional, with report of average systolic and diastolic BP and subsequent communication of a treatment plan to the patient (can be submitted once per calendar month and cannot be used in the same calendar month as codes for ABPM, remote physiological monitoring, or chronic care management)

See the AMA's [SMBP CPT Coding](#) and [AHA/AMA's Medicare Coverage Expansion of ABPM](#)

ABPM, ambulatory blood pressure monitoring; AMA, American Medical Association; AHA, American Heart Association; CPT, current procedural terminology; ICD, International Classification of Diseases; SMBP, self-monitoring of blood pressure

HTN and identify HTN phenotypes, refer to the section **Diagnosing Hypertension**.

Values in the **Table** are derived from studies conducted in Europe, Asia, and South America.⁸ Whether thresholds should be different for different populations has yet to be fully elucidated, although some studies suggest the need for more exploration.^{14,15}

DIAGNOSING HYPERTENSION

Screen adults without a diagnosis of HTN regularly for HTN. Conduct annual screenings in adults aged 40 years or older and in adults aged younger than 40 years who are at increased risk for HTN.⁷ Screen adults aged 18 to 39 years without risk factors every 3 to 5 years.⁷

In addition to the recommendations for routine screening, consider screening with out-of-office BP monitoring for patients with evidence of end organ damage, a history of cardiovascular disease, or an office BP reading that is consistently close to your diagnostic threshold.

Diagnose HTN based on the average of a minimum of 2 separate BP readings taken at each of at least 2 separate office visits, with diagnostic confirmation using an average of out-of-office measurements. An exception is made for patients with an office BP of $\geq 160/100$ mm Hg, for whom a diagnosis of HTN can be made and treatment initiated without further confirmatory readings. Depending on the patient's clinical presentation and findings on examination, initiate pharmacologic treatment with close follow-up.^{6,8}

For a diagnostic confirmation of HTN, the US Preventive Services Task Force considers ABPM the reference standard, with HBPM being an acceptable alternative.⁷ A recent review concludes that neither method is superior to the other and that HBPM may be more acceptable and accessible for some patients^{5,6}; clinicians should be guided by patient preference and the accessibility

of ABPM in making their decision. For diagnostic purposes, a recommended HBPM measurement regimen is at least 2 readings taken at least 1 minute apart every morning and evening over 7 days, with a minimum of 3 days.^{5,6} The average of all systolic and average of all diastolic BP readings should be taken for each monitoring period.^{5,6} ABPM reports automatically provide averages for each period, ie, daytime, nighttime, and 24-hour readings. When using ABPM, the 2017 guideline from the American College of Cardiology and American Heart Association recommends using the daytime average to confirm the presence of HTN and to evaluate for white coat and masked hypertension.^{8,16,17} Some experts recommend also considering the 24-hour and nighttime averages when confirming a hypertension diagnosis (see section on **Interpreting Out-of-Office BP Measurements**, page 3).^{5,6,8,16-18}

For patients who cannot purchase a home BP monitor, consider distributing BP monitors at your practice or establishing an HBPM device [loaner program](#). For patients who cannot or prefer not to measure their BP at home, consider referral to a [local pharmacy](#) where a trained staff member can measure their BP, or suggest that they use a BP kiosk.

HTN PHENOTYPES FOR THOSE NOT TAKING ANTIHYPERTENSIVE MEDICATIONS

- **Sustained normotension:** Neither in-office nor out-of-office BP measurements are in the hypertensive range. Continue screening in the office for HTN annually for adults aged 40 years or older and adults aged younger than 40 years at increased risk, and every 3 to 5 years for adults aged younger than 40 years with no other risk factors.⁷
- **Sustained HTN:** Both in- and out-of-office BP measurements are in the hypertensive range. Begin treatment with lifestyle modification

TABLE. OUT-OF-OFFICE BP VALUES CORRESPONDING TO SPECIFIC OFFICE VALUES, mmHg⁸

Row	Office	HBPM	Daytime ABPM	Nighttime ABPM	24-hour ABPM
1	120/80	120/80	120/80	100/65	115/75
2	130/80 ^a	130/80	130/80	110/65	125/75
3	140/90 ^b	135/85	135/85	120/70	130/80
4	160/100	145/90	145/90	140/85	145/90

ABPM, ambulatory blood pressure monitoring; BP, blood pressure; HBPM, home blood pressure monitoring

^aOffice threshold recommended by the 2017 ACC/AHA High Blood Pressure Guideline

^bOffice threshold recommended by The Seventh Report of the Joint National Committee on Prevention, Detection, Evaluation, and Treatment of High Blood Pressure

(**Box 3**^{8,19-22}) and antihypertensive medications as clinically appropriate.

- **White coat HTN:** Office BPs are in the hypertensive range, but out-of-office BPs are not. White coat HTN affects 15% to 30% of people whose office BPs are in the hypertensive range.⁵ Failure to identify white coat HTN can result in an overdiagnosis of HTN. Patients with white coat HTN may be at greater risk for the development of sustained HTN than those without white coat HTN, which emphasizes the importance of following current guideline recommendations for prescribing lifestyle modification (**Box 3**) and annual ABPM or HBPM to screen for the development of sustained HTN.⁸ Knowledge of the clinical course of white coat HTN is

evolving; it is not yet clear whether antihypertensive treatment lowers risk of cardiovascular disease (CVD) in patients with white coat HTN.⁵

- **Masked HTN:** Office BPs are not in the hypertensive range, but out-of-office BPs are in the hypertensive range. Masked HTN affects 15% to 30% of people whose office BPs are not in the hypertensive range.⁵ Compared with normal BP, masked HTN is associated with greater prevalence of target organ damage and risk of CVD, stroke, and mortality, making it important to diagnose and treat this condition based on out-of-office BP values.^{5,6,8}
- **Other phenotypes,** including nocturnal HTN and BP dipping profiles: These can be

BOX 3. NONPHARMACOLOGIC INTERVENTIONS FOR ELEVATED BP AND HYPERTENSION^{a,8,19-22}

Modification	Recommendation
Weight management	<ul style="list-style-type: none"> • For patients with BMI of 18.5-24.9 kg/m² <ul style="list-style-type: none"> ◦ Maintain body weight • For patients with BMI of ≥25.0 kg/m² <ul style="list-style-type: none"> ◦ Lose 5% or more of body weight
Healthy eating	<ul style="list-style-type: none"> • Eat a heart-healthy diet (eg, DASH) <ul style="list-style-type: none"> ◦ Have fruits, vegetables, whole grains, low-fat dairy foods ◦ Limit saturated and total fat
Sodium intake	<ul style="list-style-type: none"> • Reduce dietary sodium to less than 2300 mg/d^b (approximately 1 teaspoon of table salt) • Be sure to count salt used as an ingredient and check the nutrition label for packaged foods • See Using Food Labels to Eat Less Sodium
Physical activity	<ul style="list-style-type: none"> • Engage in both aerobic and muscle-strengthening physical activity <ul style="list-style-type: none"> ◦ Do at least 150 min of moderate-intensity or 75 min of vigorous-intensity aerobic activity each week ◦ Do muscle-strengthening activities 2 or more days each week
Alcohol^c	<ul style="list-style-type: none"> • Limit alcohol to a moderate amount to avoid raising blood pressure • Moderate drinking is defined as: <ul style="list-style-type: none"> ◦ Females: Up to 1 standard drink^c daily ◦ Males: Up to 2 standard drinks^c daily
Potassium	<ul style="list-style-type: none"> • Maintain adequate potassium intake^d <ul style="list-style-type: none"> ◦ Consume a dietary pattern rich in potassium (preferred) or ◦ Consider supplementing if adequate potassium intake cannot be achieved through diet • Current recommended adequate intake levels^e for adults aged 19 years and up <ul style="list-style-type: none"> ◦ Females: 2600 mg/d ◦ Males: 3400 mg/d

BMI, body mass index; BP, blood pressure; DASH, Dietary Approaches to Stop Hypertension

^aRecommend smoking cessation for overall cardiovascular disease risk reduction

^b2300 mg/day is consistent with the Chronic Disease Risk Reduction Intake reference value from the National Academy of Sciences; the American Heart Association recommends an ideal of <1500 mg/day

^cApproximately 14 g of pure alcohol (ie, regular beer, 12 oz; wine, 5 oz; hard liquor, 1.5 oz)

^dIf not contraindicated (eg, by chronic kidney disease, current medications that reduce potassium excretion, hyperkalemia)

^eAdequate intake is the [recommended daily intake](#) of a nutrient estimated by the Institute of Medicine to meet or exceed the amount needed to maintain adequate nutrition for most people

diagnosed with nighttime BP readings. ABPM can also diagnose an exaggerated surge in morning BP. However, the data on how to treat these phenotypes are limited. For more information, see [Measurement of Blood Pressure in Humans: A Scientific Statement from the American Heart Association](#).

MANAGING HYPERTENSION

Out-of-office BP monitoring is used for a variety of reasons in the management of HTN: titration of medications, identification of HTN phenotypes, workup in the presence of end organ damage or high overall CVD risk, and support of patient self-management.^{5,8} Measurement frequency and modality will vary according to patient preference and treatment progress, but HBPM is considered the more practical approach for managing HTN.⁸ For example, one might prescribe a week of HBPM readings after a change in the treatment regimen and during the week before the next office visit.⁸ Once BP is controlled and has remained stable for several months, HBPM monitoring 1 to 3 days every week may be sufficient.^{5,6}

HBPM combined with ongoing communication, or feedback loops, can improve systolic BP on average by up to 6 mm Hg at 12 months in patients who take antihypertensive medications.²³ Create an effective feedback loop by developing a communication plan with the patient that includes the following:

- When and how to report self-measured BP readings;
- How to get in touch if their BP is consistently outside the acceptable range between scheduled appointments; and
- Which BP levels require urgent or emergency care and what to do in this case.

Patients should also report self-management behaviors, medication side effects, barriers to adherence, and any other relevant information. After reviewing this information, counsel the patient about medication adjustments, diet and physical activity, recommendations to improve adherence, and available community resources.²⁴

HTN PHENOTYPES FOR THOSE WHO ARE TAKING ANTIHYPERTENSIVE MEDICATIONS

- **Controlled HTN:** Both in- and out-of-office measurements are at goal BP. Continue usual follow-up and monitoring.

- **Uncontrolled HTN:** Both in- and out-of-office measurements are above goal BP in patients taking antihypertensive medication. Evaluate for medication adherence and response to treatment at monthly intervals until control is reached.⁹
- **White coat uncontrolled HTN (also known as white coat effect):** Office BPs are in the uncontrolled hypertensive range and out-of-office BPs are at goal BP in patients taking antihypertensive medication.^{5,6} Failure to identify white coat effect can result in the overtreatment or misclassification of patients as having treatment-resistant HTN. Assess patients for BP control on the basis of out-of-office BP values whenever possible.
- **Masked uncontrolled HTN (also known as masked effect):** Office BPs are at goal and out-of-office BPs are in the uncontrolled hypertensive range in patients taking antihypertensive medication.^{5,6} Like its counterpart in untreated patients, masked uncontrolled HTN is associated with an increased prevalence of target organ damage and risk of CVD, stroke, and mortality in comparison with normal BP.^{5,6,8} Treatment changes should be based on the out-of-office BP values.

OUT-OF-OFFICE BP MONITORING IN YOUR PRACTICE WORKFLOW

Before you develop a new or update an existing protocol for out-of-office BP monitoring, consider the protocol you use to measure BP in your office and examine your space configuration (see [Quick Start Guide to Measure Accurately](#)). If you are still measuring BP manually, consider changing to an automated measurement. Recent guidance states that office BP measurement with an automated monitor should be considered the preferred approach over manual measurement.⁵ Keep in mind that even small changes in BP measurement protocols, such as providing arm and back support, can lead to more accurate measurement.

An assessment tool can help ensure that office equipment and patient positioning will support accurate measurement. In a targeted intervention conducted by the NYC DOHMH, independent healthcare practices were able to make their settings more conducive to accurate BP measurement by using an 11-question assessment tool adapted from the American Heart Association's

Target: BP materials. A perfect score of 100% represented the use of a seat with back support; a flat surface for the patient's arm that was adjustable for either arm and could be set to heart level; location of a functioning monitor in a quiet area; and availability of small, regular, large, and extra-large cuffs as well as a tape measure. After completing the assessment and making upgrades, the average score increased from 68% to 84% (unpublished data, NYC DOHMH). The most common upgrades involved adding equipment such as an adjustable arm rest, a small and an extra-large cuff size, and a tape measure (unpublished data, NYC DOHMH). See [Clinic Assessment Tool for Blood Pressure Measurement](#).

Once you have optimized your in-office BP measurement protocol, develop a protocol for out-of-office BP monitoring (**Box 4; Figure**). Give instructions to patients who will use SMBP (**Box 5^{6,8,25}**), and provide resources as needed to patients receiving or who are referred for ABPM (**Resources for Patients**).

SUMMARY

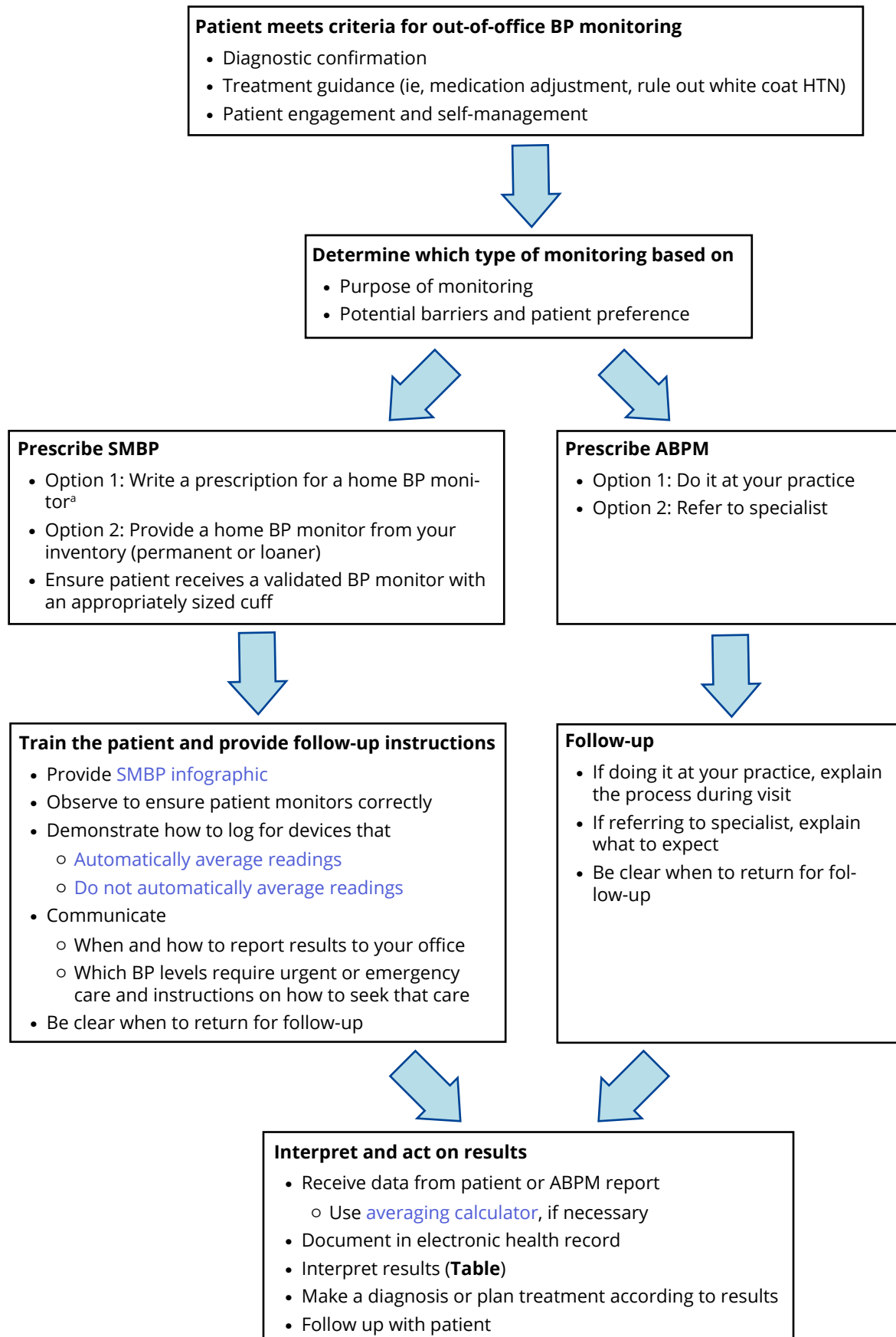
For many patients, BP measurements taken in the office and out of the office differ. Measuring out-of-office BP is the only way to identify important phenotypes such as white coat HTN, white coat effect, masked HTN, and masked uncontrolled HTN. Out-of-office BP measurements are more closely linked to risk of CVD events than in-office measurements and can also help detect hypotension, which can lead to syncope and falls among those taking antihypertensive medications. With clinical support and feedback to patients, out-of-office BP measurement is an essential component of the diagnosis and management of HTN.

BOX 4. PREPARING TO PRESCRIBE OUT-OF-OFFICE BP MONITORING

1. Determine how the office will prescribe out-of-office BP monitoring
 - ABPM: Provide onsite or refer to a specialist
 - SMBP: Prescribe specific device models or distribute home BP monitors from office inventory
2. Establish protocols for patients to communicate SMBP readings and for clinical staff to document out-of-office BP values in the electronic medical record
3. Identify and train staff according to their roles
 - Give special attention to training staff on how to determine cuff size and position the patient accurately (see [Technique Quick Check](#) and [In-office BP Measurement Graphic](#))
4. Review insurance plan coverage of home BP monitors to help patients obtain them

*Consider supplementing these recommendations with local community resources to support workflow (ie, work with local organizations for community-based SMBP training or a loaner program, collaborate with local pharmacist) (**Resources**)*

ABPM, ambulatory blood pressure monitoring; BP, blood pressure; SMBP, self-monitoring of blood pressure

FIGURE. OUT-OF-OFFICE BP MONITORING WORKFLOW

ABPM, ambulatory blood pressure monitoring; BP, blood pressure; HTN, hypertension; SMBP, self-monitoring of blood pressure
^aStaff should support the patient through the steps to obtain a BP monitor

BOX 5. WHAT TO TELL PATIENTS ABOUT SMBP^{6,8,25}**When to take and record your blood pressure**

- Take your blood pressure when you get up in the morning before you take your medication and again in the evening before dinner
- Each time, take your blood pressure at least 2 times and 1 minute apart
- Monitor your blood pressure for at least 3 days, preferably for 7 days, before a doctor/office visit
- Keep a record, including the date and time, of your blood pressure readings
- Be sure to follow the directions for accurate blood pressure readings

How to take your blood pressure correctly

- Use an automated blood pressure monitor with a properly sized upper arm cuff (with memory, if possible)
- Before you take your blood pressure
 - Empty your bladder (urinate)
 - Do not eat, have caffeine, smoke, exercise, or take a decongestant for 30 minutes
- Sit quietly (relax) in a chair for 5 minutes before you take your blood pressure
- Do not talk or have other distractions (eg, television, phone) while taking your blood pressure
- Sit with your back straight and supported in a chair with your feet flat on the floor and legs uncrossed
- Place the cuff on your bare upper arm so the middle of the cuff is at the level of your heart and the bottom of the cuff is just above the bend in your elbow
- Keep your arm with the cuff relaxed and straight on a flat surface, such as a table, and at the level of your heart
- Keep your hand open with the palm facing upward toward the ceiling

How to report your results

Choose the method(s) most appropriate for your practice and patient preference, for example:

- Bring a paper log to your visit (you may handwrite a log or download and print a log form from a website/app)
- Bring your blood pressure monitor to your visit if it records your readings
- Upload the values to the patient portal or send via the patient portal message system
- Give the values to someone in our office during a phone or video call/visit

What to do if your blood pressure is outside the acceptable range

- Seek care immediately if blood pressure is _____
- Call my office if blood pressure is _____

See Resources for more information and patient handouts

RESOURCES FOR PROVIDERS**General information**

- US Department of Health and Human Services. The Surgeon General's Call to Action to Control Hypertension: <https://www.hhs.gov/sites/default/files/call-to-action-to-control-hypertension.pdf>
- National Institutes of Health. Nutrient Recommendations: Dietary Reference Intakes: https://ods.od.nih.gov/Health-Information/Dietary_Reference_Intakes.aspx

Clinical tools

- New York City Department of Health and Mental Hygiene (NYC DOHMH). Clinic Assessment Tool for Blood Pressure Measurement: <https://nycreach.org/wp-content/uploads/2021/09/Clinical-Assessment-Tool-for-Blood-Pressure-Measurement.pdf>
- NYC DOHMH. Hypertension Action Kit: <https://www1.nyc.gov/site/doh/providers/resources/public-health-action-kits-hypertension.page>
- Million Hearts. Self-measured Blood Pressure Monitoring: <https://millionhearts.hhs.gov/tools-protocols/smbp.html>

- National Association of Community Health Centers. Self-measured Blood Pressure Monitoring: Implementation Guide for Health Care Delivery Organizations: <https://www.nachc.org/wp-content/uploads/2018/09/NACHC-Health-Care-Delivery-SMBP-Implementation-Guide-08222018.pdf>
- American Medical Association (AMA). The 7-step Self-measured Blood Pressure Quick Guide: <https://www.ama-assn.org/delivering-care/hypertension/7-step-self-measured-blood-pressure-smbp-quick-guide>
- AMA and Johns Hopkins Medicine. Self-measured Blood Pressure Monitoring Program: Engaging Patients in Self-measurement: https://www.ama-assn.org/sites/ama-assn.org/files/corp/media-browser/public/about-ama/iho-bp-engaging-patients-in-self-measurement_0.pdf
- AMA. Self-measuring of Blood Pressure (SMBP) CPT Coding Guide: <https://www.ama-assn.org/system/files/2020-06/smbp-cpt-coding.pdf>

RESOURCES FOR PROVIDERS *(continued)*

- AMA. Self-measured Blood Pressure Cuff Selection: <https://www.ama-assn.org/system/files/2020-11/smbp-cuff-selection.pdf>
- American Heart Association (AHA) and AMA. Target: BP: Tools and Downloads: https://targetbp.org/tools_downloads
- AHA and AMA. Target: BP: Quick Start Guide to Measure Accurately: https://targetbp.org/tools_downloads/quick-start-guide-to-measure-accurately
- AHA and AMA. Target: BP: Loaning Out Devices: <https://targetbp.org/patient-measured-bp/implementing/smbp-device-loaner-program>
- AHA and AMA. Target: BP: SMBP Average Calculator: https://targetbp.org/tools_downloads/smbp-average-calculator
- AHA and AMA. Target: BP: SMBP Device Accuracy Test: https://targetbp.org/tools_downloads/device-accuracy-test
- AHA and AMA. Target: BP: Technique Quick Check: https://targetbp.org/tools_downloads/technique-quick-check
- AHA and AMA. Target: BP: In-office Blood Pressure Measurement Graphic: https://targetbp.org/tools_downloads/mbp
- AHA and AMA. Target: BP: Medicare Coverage Expansion of Ambulatory Blood Pressure Monitoring: https://targetbp.org/tools_downloads/medicare-coverage-expansion-of-ambulatory-blood-pressure-monitoring-abpm

Validated devices

- AMA. US Blood Pressure Validated Device Listing: <https://www.validatebp.org>

RESOURCES FOR PATIENTS

General information

- New York City Department of Health and Mental Hygiene (NYC DOHMH). High Blood Pressure Health Bulletin: <https://www1.nyc.gov/assets/doh/downloads/pdf/public/dohmhnews15-02.pdf>
- NYC DOHMH. Using Food Labels to Eat Less Sodium: <https://www1.nyc.gov/assets/doh/downloads/pdf/csi/food-label-sodium.pdf>
- National Institutes of Health. DASH Eating Plan: <https://www.nhlbi.nih.gov/education/dash-eating-plan>

Self-monitoring of blood pressure (SMBP)

- NYC DOHMH. Hypertension Action Kit: <https://www1.nyc.gov/site/doh/providers/resources/public-health-action-kits-hypertension.page>
Patient education materials available in multiple languages
- American Heart Association (AHA) and American Medical Association (AMA). Target: BP: What Is SMBP? https://targetbp.org/tools_downloads/what-is-smbp

- AHA and AMA. Target: BP: SMBP Infographic: https://targetbp.org/tools_downloads/how-to-accurately-measure-blood-pressure-2
- AHA and AMA. Target: BP: SMBP Recording Log (Device Average): https://targetbp.org/tools_downloads/7-day-recording-log-2-timesday-average
For devices that automatically average readings
- AHA and AMA. Target: BP: SMBP Recording Logs: https://targetbp.org/tools_downloads/7-day-recording-log-2-timesday
For devices that do not automatically average readings
- AHA and AMA. Target: BP: Using a Wrist Cuff to Measure Blood Pressure: https://targetbp.org/tools_downloads/using-a-wrist-cuff-to-measure-blood-pressure

Blood pressure check locations

- NYC Health Map: <https://a816-healthpsi.nyc.gov/NY-CHHealthMap>

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