CLINICAL MEDICAL POLICY	
Policy Name:	Automated Ambulatory Blood Pressure Monitoring (ABPM)
Policy Number:	MP-090-MD-PA
Responsible Department(s):	Medical Management
Provider Notice/Issue Date:	10/01/2024; 08/01/2023; 09/01/2022; 08/20/2021; 08/10/2020; 09/16/2019; 07/15/2018
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Next Annual Review:	07/2025
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Products:	Highmark Wholecare℠ Medicaid
Application:	All participating hospitals and providers
Page Number(s):	1 of 13

Policy History

Date	Activity
11/01/2024	Provider Effective date
07/17/2024	QI/UM Committee review
08/21/2024	Annual Review: Added 'Gestational Hypertension' clinical criteria to 'Procedures' section. Revised 'Procedure' sections guidelines. Added CPT code 93050 as a Noncovered Procedure Code. Updated 'Summary of Literature' and 'Reference Sources' sections.
09/01/2023	Provider Effective date
07/19/2023	QI/UM Committee review
07/19/2023	Annual Review: No changes to clinical criteria. Updated CMS guidance. Updated pediatric patients BP table. Updated 'Reference Sources' section.
10/01/2022	Provider Effective date
07/20/2022	QI/UM Committee review
07/20/2022	Annual Review: No changes to clinical criteria. Updated Summary of Literature and Reference Sources sections.
09/20/2021	Provider Effective date
07/19/2021	QI/UM Committee Review

07/19/2021	Annual Review: Added 'white coat hypertension' to Definitions section. Updated Summary of Literature, Informational, and Reference Sources sections. Added the following CPT codes: 93786, 93788, & 93790.
09/07/2020	Provider Effective date
07/15/2020	QI/UM Committee review
07/15/2020	Annual Review: No clinical criteria changes; removed hyperlinks; revised CPT code description for 93784 and deleted code 93786, 93788, & 93790; updated Governing Bodies section with CMS coverage
09/16/2019	Provider Effective date
07/17/2019	QI/UM Committee review
07/17/2019	Annual Review: Revised blood pressure requirement for white coat hypertension; added additional coverage criteria for masked hypertension; updated literature summary, added ICD-10 DX code I10; removed the following criteria-absence of hypertensive end organ damage on physical exam and laboratory testing ; revised format; Removed hyperlinks from all reference in the Reference section
07/15/2018	Provider effective date
05/09/2018	Updated Operational Guidelines patients must be 3 years of age and older, all services not meeting the requirements in the policy should deny as not medically necessary. Attachment D is informational.
04/18/2018	QI/UM Committee review
04/18/2018	Revision: Removed the word 'Covered' from the procedure and diagnosis code tables in Attachments B & C
03/27/2018	Initial policy developed

Disclaimer

Highmark Wholecare℠ medical policy is intended to serve only as a general reference resource regarding coverage for the services described. This policy does not constitute medical advice and is not intended to govern or otherwise influence medical decisions.

Policy Statement

Highmark Wholecare℠ may provide coverage under the medical-surgical benefits of the Company's Medicaid products for medically necessary adult and pediatric ambulatory blood pressure monitoring (ABPM) for suspected white coat hypertension.

This policy is designed to address medical necessity guidelines that are appropriate for the majority of individuals with a particular disease, illness or condition. Each person's unique clinical circumstances warrant individual consideration, based upon review of applicable medical records.

(Current applicable Pennsylvania HealthChoices Agreement Section V. Program Requirements, B. Prior Authorization of Services, 1. General Prior Authorization Requirements.)

Definitions

Hypertension - Also known as high blood pressure (B/P), is a long term medical condition in which the blood pressure in the arteries is persistently elevated.

Ambulatory Blood Pressure Monitoring (ABPM) - A portable device that takes and records blood pressure intermittently in 24-hour cycles, during normal daily activities. These devices may be fully automated, thereby they inflate at preprogrammed intervals. The devices can be semi-automated and are patient-activated.

Nocturnal Dip - A significant day-night difference in blood pressure of more than 10% or more than 10/5 mm Hg.

Masked Hypertension (MHT) - A nonelevated blood pressure in the clinical setting with elevated blood pressure assessed by ambulatory monitoring. Defined as an average office blood pressure between 120 mm Hg and 129 mm Hg for systolic blood pressure or between 75 mm Hg and 79 mm Hg for diastolic blood pressure on two (2) separate clinic/office visits with at least two (2) separate measurements made at each visit and with at least two (2) blood pressure taken outside the office which are greater than or equal to 130/80 mm Hg.

White Coat Hypertension – Individuals experience a spike in their blood pressure specifically when it is measured at the doctor's office but not in other settings, such as the home. Defined as an average office blood pressure of systolic blood pressure greater than 130mm Hg but less than 160 mm Hg, or a diastolic blood pressure greater than 80 mm Hg but less than 100mm Hg on two (2) separate clinic/office visits with at least two (2) separate measurements made at each visit with at least two (2) blood pressure measurements taken outside the office which are less than 130/80 mm Hg.

Procedure

1. ABPM is considered medically necessary when the ANY ONE of the following criteria are met:
   A. Adult Criteria
      1) Suspected white coat hypertension (WCH) with no evidence of end-organ damage:
         a. The physician has performed at least three (3) blood pressure measurements at least one (1) week apart in the office; AND
         b. Blood pressure measurements by non-physicians (e.g., nurse, technician) in the office have been done and stage one hypertension readings have been obtained but <180/110, not requiring immediate treatment with medications; AND
         c. The individual has repeated blood pressure measurements at home over at least one (1) month, and the diagnosis of hypertension remains in question; OR
      2) Resistant hypertension in individuals who are being treated with three (3) or more medications; OR
      3) Hypertensive individuals with hypotensive symptoms thought to be related to antihypertensive medications or neurological symptoms; OR
      4) For individuals whose symptomology (paroxysms of excessive sweating, palpitations, apprehension) suggest episodic hypertension secondary to an adrenal tumor and office blood pressure measurements are repeated normal; OR

5) For evaluation of syncope or near syncope when used in conjunction with a 24 hour Holter monitor to determine whether symptoms are the direct result of arrythmia; OR
6) To investigate blood pressure changes in individuals with nocturnal angina.

B. Gestational Hypertension Criteria
   1) Presence of hypertensive disorders of pregnancy (HDP), which include ANY of the following:
      a. Chronic hypertension (high blood pressure was present before pregnancy or developed in the first 20 weeks of pregnancy); OR
      b. Gestational hypertension (blood pressure is measured at 140/90mm Hg or higher, occurs after the first 20 weeks of pregnancy, and blood pressure was normal before pregnancy); OR
      c. Mild preeclampsia:
         i. Blood pressure is 140/90mm Hg or higher with ANY of the following:
            I) Urine with 0.3 or more grams of protein in a 24-hour specimen (a collection of every drop of urine within 24 hours) or a protein-to-creatinine ratio greater than 0.3; OR
            II) Blood tests that show kidney or liver dysfunction
            III) Fluid in the lungs and difficulty breathing
            IV) Visual impairments
      d. Severe preeclampsia:
         i. Blood pressure is measured as 160/110mm Hg or higher on two occasions at least 4 hours apart while the patient is on bed rest; OR
         ii. Urine with five (5) or more grams of protein in a 24-hour specimen or three (3) or more grams of protein on two (2) random urine samples collected at least four hours apart; OR
         iii. Tests results suggesting kidney or liver damage, e.g., blood tests that reveal low numbers of platelets or high liver enzymes; OR
         iv. Severe, unexplained stomach pain that does not respond to medication; OR
         v. Symptoms that include visual disturbances, difficulty breathing, or fluid buildup; OR
      e. Eclampsia; OR
      f. Preeclampsia superimposed on chronic hypertension (individual has ANY of the preeclampsia conditions listed above along with high blood pressure that was present prior to pregnancy, protein in urine, and/or fluid buildup.)

C. Pediatric/Adolescents Criteria
   1) ABPM may be considered medically necessary in children/adolescents greater than or equal to age five (5) in ANY of the following settings:
      a. Confirming the diagnosis of hypertension including differentiating true hypertension from white coat hypertension:
         i) When office blood pressure measurements are in the elevated blood pressure category for one (1) year or more; OR
         ii) When blood pressure measurements fall within the Stage 1 hypertension category over three (3) clinic visits at least one (1) or two (2) weeks apart; OR
         iii) When blood pressure measurements fall within the Stage 2 hypertension category twice within one (1) week; OR

b. Assessing symptoms related to suspected drug-related hypotension; OR
c. Drug resistant hypertension; OR
d. To assess effectiveness of hypertensive treatment; OR
e. Children and adolescents with ANY of the following:
    i) A history of aortic coarctation; OR
    ii) A history of low birth weight; OR
    iii) Chronic Kidney Disease (CKD) and structural renal abnormalities; OR
    iv) Endocrine disorders associated with hypertension (e.g., congenital adrenal hyperplasia, familial hyperaldosteronism, etc.); OR
    v) Genetic syndromes associated with hypertension (e.g., neurofibrostomas, Turner syndrome, Williams syndrome, sickle cell disease, etc.); OR
    vi) Obesity; OR
    vii) Sleep-Disordered Breathing (SDP); OR
    viii) Type 1 Diabetes Mellitus (T1DM); OR
    ix) Type 2 Diabetes Mellitus (T2DM).

Note: ABPM in children and adolescents should be used by experts in the field of pediatric nephrology and pediatric cardiology who are experienced in its use and interpretation.

2. ALL of the following automated ABPM device criteria must be met:
    a. Must be used for a duration of at least 24 hours but no more than 48 hours; AND
    b. The automated device must be performed using an FDA-approved machine that has been validated; AND
    c. The device must be capable of producing standardized plots of blood pressure measurements for 24 hours with daytime and nighttime windows and normal blood pressure bands demarcated; AND
    d. The findings must be provided to patients with oral and written instructions and a test run in the physician's office must be performed; AND
    e. The findings must be read by the treating physician or treating non-physician practitioner.

3. Contraindications

    ABPM devices should not be used on ANY of the following:
    - On neonates and children under the age of 3 years
    - On individuals with severe clotting disorders
    - On individuals with severe cardiac rhythm abnormalities (e.g., atrial fibrillation)
    - On individuals with latex allergy

3. When the automated ABPM services are not considered medically necessary
    - ABPM is limited to one (1) monitoring session per individual, per calendar year
    - Non-invasive assessment of central blood pressure (e.g., SphygmoCor System) is considered experimental/investigation and therefore not covered because the safety and/or effectiveness of this service cannot be established by the available published peer-reviewed literature.
    - The use of automated ABPM for any condition not listed above will be considered NOT medically necessary. Examples of noncovered conditions include, but are not limited to:
        - Blood pressure monitoring in individuals with heart failure
        - Blood pressure monitoring of pregnant women who do not meet the criteria above
        - The diagnosing of malignant hypertension

- In individuals with irregular cardiac arrhythmias
- To evaluate the effectiveness of blood pressure treatment
- For the evaluation of individuals with uncomplicated hypertension or to screen for hypertension

4. Post-payment Audit Statement
   The medical record must include documentation that reflects the medical necessity criteria and is subject to audit by Highmark Wholecare℠ at any time pursuant to the terms of your provider agreement.

5. Place of Service
   The proper place of service for ABPM is outpatient.

Governing Bodies Approval

Examples of FDA-approved ABPM, not all inclusive:

- Pressure Trak Ambulatory Blood Pressure Measurement System
  FDA-approved indication: A non-invasive oscillometric ambulatory blood pressure monitor that is intended for use as an aid or adjunct to diagnosis and treatment when it is necessary to measure an adult patient's systolic and diastolic blood pressures over an extended period of time.
- ABP-2000 G-3
  FDA-approved indication: A non-invasive oscillometric ambulatory blood pressure monitor that is intended for use as an aid or adjunct to diagnosis and treatment when it is necessary to measure a patient's systolic and diastolic blood pressures over an extended period of time.
- Welch Allyn ABPM 6100
  FDA-approved indication: A non-invasive oscillometric ambulatory blood pressure monitor that is intended for use as an aid or adjunct to diagnosis and treatment when it is necessary to measure adult or pediatric patients' systolic and diastolic blood pressures over an extended period of time.

The use of the ABPM device outside of listed FDA guidelines will require approval from a Medical Director on a case-by-case basis.

CMS
The Centers for Medicare & Medicaid Services (CMS) has published the following guidance:

- National Coverage Determination (NCD) Ambulatory Blood Pressure Monitoring (20.19)

Summary of Literature

Hypertension
Nearly half of adults in the United States (119.9 million, or 48.1%) have high blood pressure defined as a systolic blood pressure greater than 130 mm Hg or a diastolic blood pressure greater than 80 mm Hg or are taking medication for high blood pressure. Only about 1 in 4 adults (22.5%) with hypertension have their condition under control. A greater percent of men (50%) have high blood pressure than women (44%). High blood pressure is more common in non-Hispanic black adults (56%) than in non-Hispanic white adults (48%), non-Hispanic Asian adults (46%), or Hispanic adults (39%) (CDC, 2024).

Blood pressure monitoring can be obtained with the use of an ambulatory blood pressure monitor (ABPM), home blood pressure monitor (HBPM), and/or in-office reading. ABPM is often used to supplement BP readings obtained in office settings. The monitors are usually programmed to obtain readings every 15 to 30 minutes throughout the day and every 15 minutes to 1 hour during the night. ABPM is conducted while individuals go about their normal daily activities. ABPM can:

- provide estimates of mean blood pressure over the entire monitoring period and separately during nighttime and daytime
- determine the daytime-to-nighttime BP ratio to identify the extent of nocturnal "dipping,"
- identify the early-morning BP surge pattern, d) estimate BP variability, and allow for recognition of symptomatic hypotension

(ACC/AHA/AAPA/ABC/ACPM/AGS/APhA/ASH/ASPC/NMA/PCNA, 2017).

The advantages of using ABPM are that it is fully automated and noninvasive, BP is recorded over an extended period of time, and the ABPM has the ability to identify BP patterns that cannot be identified with office BP readings. The ABPM has been used in situations to confirm white coat hypertension, resistant hypertension, masked hypertension, nocturnal hypertension, in pregnancy, to monitor drug therapy, ambulatory hypotension, and autonomic dysfunction, underlying systemic abnormalities.

The United States Preventive Services Task Force (USPSTF) published the '**A**' recommendation that individuals 18 years of age and older are to be screened for hypertension. The recommendation states that screening for high blood pressure in adults aged 18 years or older and that obtaining measurements *outside* of the clinical setting for diagnostic confirmation should be done before starting treatment. The USPSTF found adequate evidence that an initial positive screening result can be confirmed by home-based blood pressure measurement or ambulatory blood pressure monitoring.

The American College of Cardiology (2017) has stressed the importance of accurate measurement of blood pressure in order to categorize the level of BP, ascertain BP-related CVD risk, and to guide the management of elevated BP. The authors recommended the use of either ABPM or HBPM (home based blood pressure monitoring) for diagnosing and monitoring white coat hypertension, to detect transition from white coat hypertension to sustained hypertension.

The National Institute for Health and Care Excellence (NICE) guidelines recommends that ABPM should be considered, in addition to clinic blood pressure measurements, for people with hypertension identified as having a white-coat effect or masked hypertension (in which clinic and non-clinic blood pressure results are conflicting). However, NICE notes that the corresponding measurements for ABPM are 5 mmHg lower than for clinic measurements. If clinic blood pressure is between 140/90 mmHg and 180/120 mmHg, ABPM should be offered to confirm the diagnosis of hypertension. Hypertension can be confirmed in patients with an ABPM daytime average of 135/85 mmHg or higher (NICE, 2023).

According to Wang and colleagues (2017), the estimated prevalence of masked hypertension (MH) in the U.S. is approximately 139.3 million adults. Men are affected more frequently than women, it is higher in persons aged 45 years or older, and more common in non-Hispanics and persons with diabetes mellitus.

The American College of Cardiology (ACC) has stated that the high prevalence of MH observed in untreated and treated individuals with normal blood pressure in the office supports a wider use of ABPM in routine clinical practice (ACC, 2018).

The European Heart Journal (2018) has recommended screening for masked hypertension. Indications for ABPM include assessment for the presence of white coat hypertension or masked hypertension; monitoring of antihypertensive medication efficacy in treated patient; assessment for the presence of nocturnal hypertension; evaluation of postural, postprandial, and drug-induced hypotension; and assessing hypotension from autonomic dysfunction, which typically requires monitoring during sleep for supine hypertension.

A study reported on strategies for classifying patients based on office, home, and ambulatory blood pressure measurement. According to the authors, using home instead of ambulatory monitoring misses the high-risk diagnoses of masked or sustained hypertension in over 25% of patients (Zhang et al.). Anstey and colleagues (2017) analyzed data from 333 community-dwelling adults not taking antihypertensive medication with clinic BP >140/90 in the Improving the Detection of Hypertension (IDH) study. Blood pressure was measured with ABPM and home blood pressure monitoring (HBPM), and comparisons of results indicated that ABPM detects many more individuals with MH with an increased cardiovascular disease risk compared to HBPM.

Hypertensive Disorders of Pregnancy (HDP)
Hypertension disorders during pregnancy have a wide range of symptoms, including mild conditions to life-threatening ones. In clinical practice, a measurement of 140/90mm Hg or higher is used to simplify diagnosis. Hypertensive disorders can include gestational hypertension, preeclampsia, eclampsia, and chronic hypertension with superimposed preeclampsia. HDP is one of the leading causes of maternal death in the U.S. Having HDP is associated with an increased risk of maternal chronic hypertension and cardiovascular disease later in life. The U.S. Preventative Services Task Force (USPSTF) has given a 'B' recommendation Grade for screening hypertensive disorders in pregnant persons with blood pressure measurements throughout pregnancy (USPSTF, 2023).

Technologies such as ABPM have allowed for out-of-the-office blood pressure monitoring. Until recently, out-of-office blood pressure measurements we not recommended in pregnant normotensive women according to office blood pressure values. However, the behavior or blood pressure during the first half of pregnancy suggests that masked hypertension is more frequent in pregnant women. Masked hypertension is a strong predictor for the development of preeclampsia and poor neonatal outcomes. ABPM allows for the evaluation of blood pressure during nocturnal rest. Nocturnal hypertension is a strong predictor or preeclampsia, which may constitute an early finding, sometimes several weeks before clinically evidence diagnosis. ABPM has been shown to have a significant role in the evaluation of blood pressure levels in pregnant women. ABPM can also be useful to evaluate hypertension control in pregnant women with chronic hypertension. In women with preeclampsia, ABPM in the post-partum period could identify those with greater long-term cardiovascular risks (Espeche & Salazar, 2023).

Pediatric Hypertension
According to the Centers for Disease Prevention and Control (CDC), the prevalence of hypertension in youths is on the rise. ABPM has become an invaluable tool in evaluating blood pressure (BP) in children. It is increasingly used to assess patients with variable BP readings in the office, wide discrepancies between the BP readings at home and in the clinician's office. ABPM is feasible for clinical use in children old enough to cooperate with the procedure. ABPM needs to be performed in a standardized, reliable fashion to provide accurate recordings, especially in small children and infants (UpToDate, 2021).

Nurses and other healthcare personnel involved in ABPM should follow a standardized approach to ABPM to maintain the functionality of the equipment, minimize measurement errors, and obtain valid, reliable,

and reproducible BP data. Care should be taken in selection of the appropriate size cuff according to published guidelines. Although casual BP is usually taken in the dominant arm, ABPM should be applied to the child's nondominant arm to avoid interference with school work, unless the child has arterial surgery on that side, such as repair of coarctation of the aorta or creation of an arteriovenous fistula.101a After application, the ambulatory BP should be measured and compared with resting, clinic BP by use of the same technique as the ABPM (auscultatory or oscillometric). If the average of 3 values is >5 mm Hg higher or lower, cuff placement should be adjusted or the device checked for calibration. Devices should be programmed to record BP every 15 to 20 minutes during waking hours and every 20 to 30 minutes during sleep. Data should be inspected visually for gross inconsistencies that fall considerably outside the normal ranges for awake or asleep BP and heart rate for the patient's age (AHA, 2014).

Coding Requirements

Procedure Codes

CPT Code	Description
93784	Ambulatory blood pressure monitoring, utilizing report-generating software, automated, worn continuously for 24 hours or longer; including recording, scanning analysis, interpretation and report
93786	Ambulatory blood pressure monitoring, utilizing report-generating software, automated, worn continuously for 24 hours or longer; recording only
93788	Ambulatory blood pressure monitoring, utilizing report-generating software, automated, worn continuously for 24 hours or longer; scanning analysis with report
93790	Ambulatory blood pressure monitoring, utilizing report-generating software, automated, worn continuously for 24 hours or longer; review with interpretation and report

Noncovered Procedure Code

This code will not be reimbursed without a Medical Director's approval on a case-by-case basis.

CPT Code	***Description***
93050	Arterial pressure waveform analysis for assessment of central arterial pressures, includes obtaining waveform(s), digitization and application of nonlinear mathematical transformations to determine central arterial pressures and augmentation index, with interpretation and report, upper extremity artery, non-invasive

Diagnosis Code

ICD-10 Code	Description
R03.0	Elevated blood-high pressure reading, without diagnosis of hypertension

Informational

Categories of BP in Adults*			
BP Category	**Systolic BP**		**Diastolic BP**
Normal	<120 mm Hg	and	<80 mm Hg
Elevated	120–129 mm Hg	and	<80 mm Hg
Hypertension			
Stage 1	130–139 mm Hg	or	80–89 mm Hg
Stage 2	≥140 mm Hg	or	≥90 mm Hg
*Individuals with SBP and DBP in 2 categories should be designated to the higher BP category.			

Revised Classification for Ambulatory Blood Pressure Studies in Pediatric Patients

Category	**Clinic systolic or diastolic blood pressure***		**Mean ambulatory systolic or diastolic blood pressure**	
	<13 y of age	**≥ 13 y of age**	**<13 y of age**	**≥ 13 y of age**
Normal BP	<95th percentile	<130/80	<95th percentile OR adolescent cut points*	<125/75mm Hg 24-h AND <130/80 mm Hg wake AND <110/65 mm Hg sleep
WCH	≥ 95th percentile	≥ 130/80		
Masked hypertension	< 95th percentile	<130/80	≥ 95th percentile OR adolescent cut points*	≥ 125/75 mm Hg 24-h OR ≥ 130/80 mm Hg wake OR ≥ 110/65 mm Hg sleep

* Including 24 h, wake, and sleep blood pressure. WCH indicates white coat hypertension.
AHA, 2022

Reimbursement

Participating facilities will be reimbursed per their Highmark Wholecare℠ contract.

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