IN THE NAME OF GOD

HYPERTESION

DFINITION

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DEFINITIONS

- The following defnitions and staging system, which are based upon **appropriately** measured blood pressure , were suggested in 2017 by the American College of Cardiology/American Heart Association (ACC/AHA)

- **Normal blood pressure** – Systolic <120 mmHg and diastolic <80 mmHg
- **Elevated blood pressure** – Systolic 120 to 129 mmHg and diastolic <80 mmHg
- **Hypertension:**
- **Stage 1** – Systolic 130 to • 139 mmHg or diastolic 80 to 89 mmHg
- **Stage 2** – Systolic at least 140 mmHg or diastolic at least 90 mmHg

DEFINITIONS

- If there is a disparity in category between the systolic and diastolic pressures, the **higher value** determines the stage.
- Isolated systolic hypertension is defined as a blood pressure ≥130 mmHg systolic and <80 mmHg diastolic, and isolated diastolic hypertension is defined as a blood pressure <130 mmHg systolic and ≥80 mmHg diastolic.
- Patients with a blood pressure ≥130 mmHg systolic and ≥80 mmHg diastolic are considered to have mixed systolic/diastolic hypertension.
- In clinical practice, patients who are taking medications for hypertension are usually defined as having hypertension, specifically "treated hypertension," regardless of their observed blood pressure.

European Guidance

- European guidance on the definition of hypertension contrasts with that of the ACC/AHA.
- The European Society of Cardiology and European Society of Hypertension (ESC/ESH), the International Society of Hypertension (ISH), as well as the National Institute for Health and Care Excellence (NICE) guidelines, define hypertension, using office-based blood pressure, as a systolic pressure ≥140 mmHg or diastolic pressure ≥90 mmHg .

DEFINITIONS

Definition of hypertension based on blood pressure measurement strategy

SBP/DBP	Clinic	SMBP	Daytime ABPM	Nighttime ABPM	24-hour ABPM
ACC/AHA Guidelines 2017 [1]	≥130/80	≥130/80	≥130/80	≥110/65	≥125/75
ESC/ESH Guidelines 2018 [2]	≥140/90	≥135/85	≥135/85	≥120/70	≥130/80

ABPM: ambulatory blood pressure monitoring; ACC/AHA: American College of Cardiology/American Heart Association; DBP: diastolic blood pressure; ESC/ESH: European Society of Cardiology/European Society of Hypertension; SBP: systolic blood pressure; SMBP: self-measured blood pressure.

Office-based blood pressure measurement

- Proper technique and interpretation of the blood pressure is essential in the diagnosis and management of hypertension.
- Rather than an auscultatory device (one that requires a stethoscope), we recommend using an oscillometric blood pressure device designed specifically for the office setting.
- In addition to obtaining multiple blood pressure measurements, blood pressure should be measured in both arms, at least at the initial visit.
- Systolic blood pressure readings in the left and right arms should be roughly equivalent. A discrepancy of more than 15 mmHg may indicate subclavian stenosis and, hence, peripheral arterial disease.
- If there is a significant difference in blood pressure between the two arms, the higher of the two should be used for measurement at subsequent visits.

Checklist for accurate measurement of blood pressure

Key steps for proper BP measurements	Specific instructions
Step 1: Properly prepare the patient	1. Have the patient relax, sitting in a chair (feet on floor, back supported) for >5 minutes. 2. The patient should avoid caffeine, exercise, and smoking for at least 30 minutes before measurement. 3. Ensure patient has emptied their bladder. 4. Neither the patient nor the observer should talk during the rest period or during the measurement. 5. Remove all clothing covering the location of cuff placement. 6. Measurements made while the patient is sitting or lying on an examining table do not fulfill these criteria.
Step 2: Use proper technique for BP measurements	1. Use a BP measurement device that has been validated, and ensure that the device is calibrated periodically.* 2. Support the patient's arm (eg, resting on a desk). 3. Position the middle of the cuff on the patient's upper arm at the level of the right atrium (the midpoint of the sternum). 4. Use the correct cuff size, such that the bladder encircles 80% of the arm, and note if a larger- or smaller-than-normal cuff size is used. 5. Either the stethoscope diaphragm or bell may be used for auscultatory readings.
Step 3: Take the proper measurements needed for diagnosis and treatment of elevated BP/hypertension	1. At the first visit, record BP in both arms. Use the arm that gives the higher reading for subsequent readings. 2. Separate repeated measurements by 1 to 2 minutes. 3. For auscultatory determinations, use a palpated estimate of radial pulse obliteration pressure to estimate SBP. Inflate the cuff 20 to 30 mmHg above this level for an auscultatory determination of the BP level. 4. For auscultatory readings, deflate the cuff pressure 2 mmHg per second, and listen for Korotkoff sounds.
Step 4: Properly document accurate BP readings	1. Record SBP and DBP. If using the auscultatory technique, record SBP and DBP as onset of the first Korotkoff sound and disappearance of all Korotkoff sounds, respectively, using the nearest even number. 2. Note the time of most recent BP medication taken before measurements.
Step 5: Average the readings	1. Use an average of ≥2 readings obtained on ≥2 occasions to estimate the individual's level of BP.
Step 6: Provide BP readings to patient	1. Provide patients the SBP/DBP readings both verbally and in writing.

Home blood pressure monitoring

- Patients should be instructed to use a validated, automated oscillometric device that measures blood pressure in the brachial artery (upper arm) and to perform measurements in a quiet room after five minutes of rest in the seated position with the back and arm supported and legs uncrossed.
- At least 12 to 14 measurements should be obtained, with both morning and evening measurements taken, over a period of one week every month.
- The mean of all available readings should be used for clinical decision-making.

Ambulatory blood pressure monitoring

- Twenty-four-hour ABPM is the preferred method for confirming the diagnosis of hypertension and white coat hypertension but has limited availability in routine clinical practice.
- High-quality data suggest that ABPM predicts target-organ damage and cardiovascular events better than office blood pressure readings.
- ABPM records the blood pressure at preset intervals (usually every 15 to 20 minutes during the day and every 30 to 60 minutes during sleep).
- ABPM can identify or confirm white coat and masked hypertension and can also be used to confirm normal blood pressure readings obtained by self-monitoring at home.
- It is also the only method of blood pressure measurement that can reliably obtain nocturnal readings.

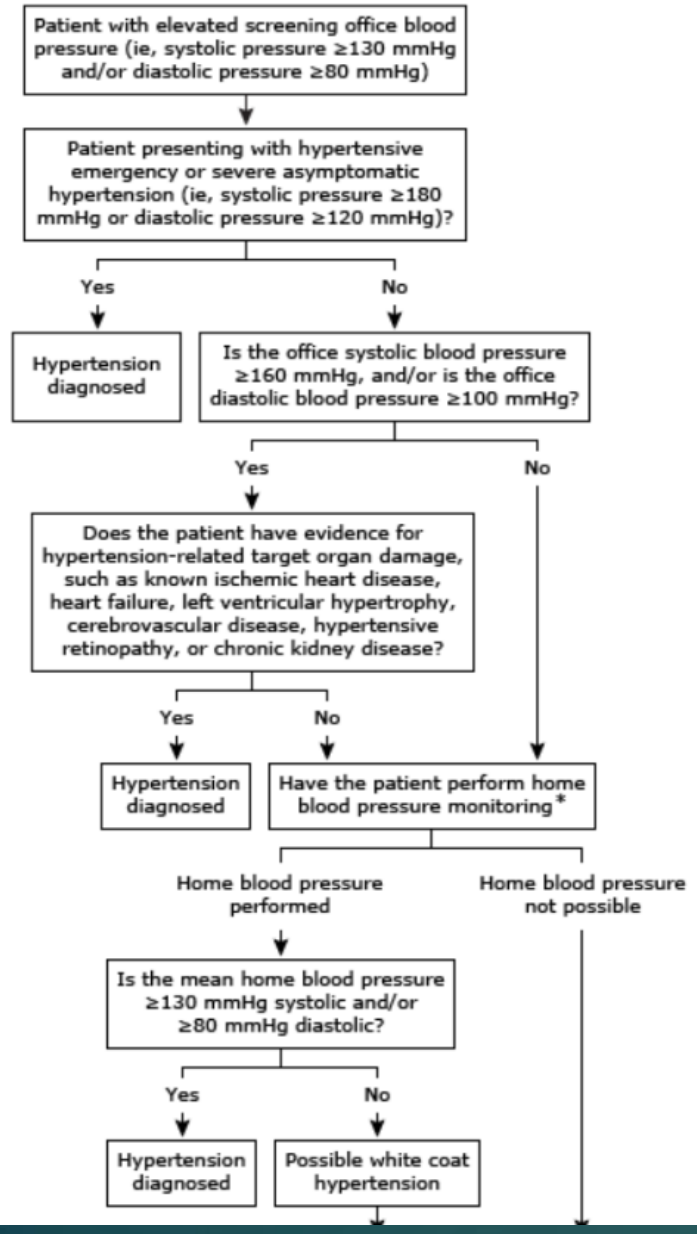
White coat hypertension

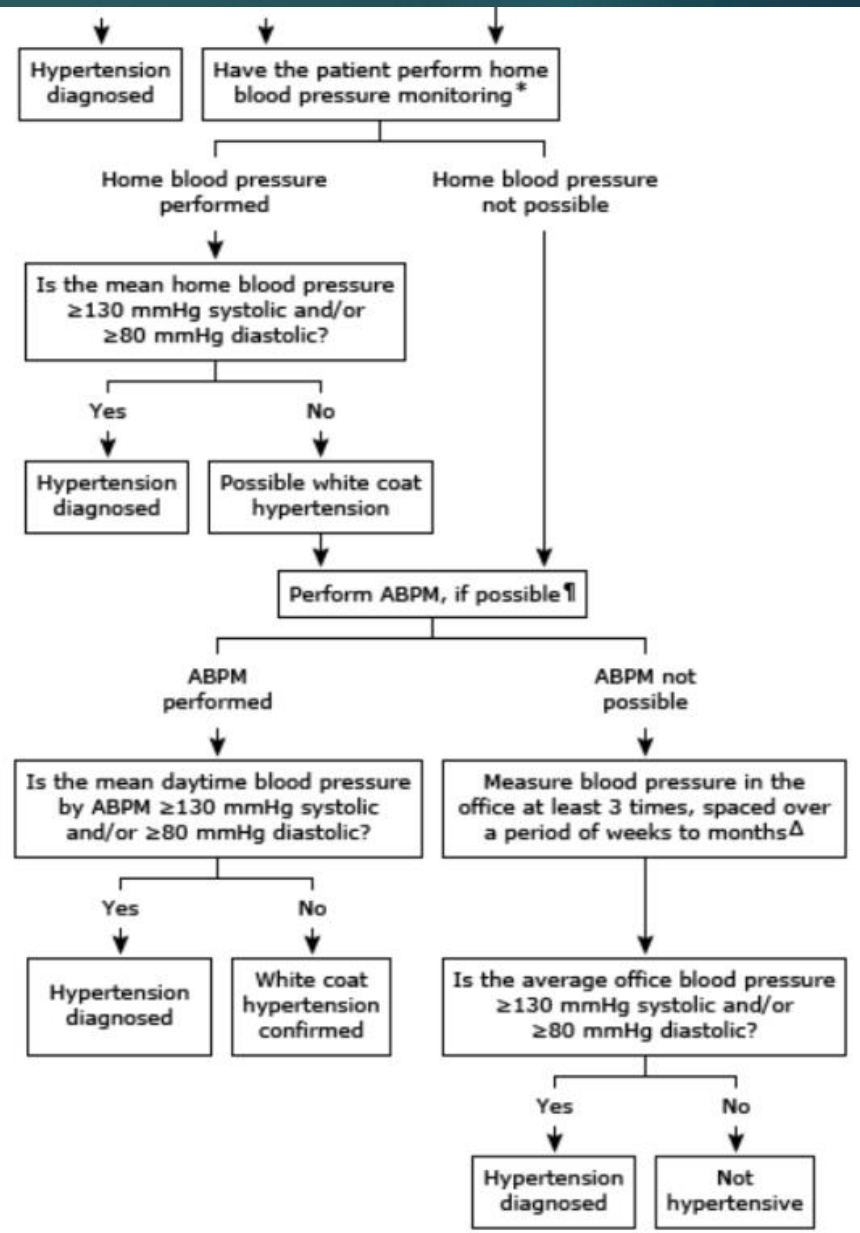
- White coat hypertension is defined as blood pressure that is consistently elevated by office readings but does not meet diagnostic criteria for hypertension based upon out-of-office readings.

Masked hypertension

- Masked hypertension is defined as blood pressure that is consistently elevated by out-of-office measurements but does not meet the criteria for hypertension based upon office readings.

“Definition” vs “Diagnosis”


Patient with elevated screening office blood pressure (ie, systolic pressure ≥130 mmHg and/or diastolic pressure ≥80 mmHg)
Patient presenting with hypertensive emergency or severe asymptomatic hypertension (ie, systolic pressure ≥180 mmHg or diastolic pressure ≥120 mmHg)?
Yes
No
Hypertension diagnosed
Is the office systolic blood pressure ≥160 mmHg, and/or is the office diastolic blood pressure ≥100 mmHg?
Yes
No
Does the patient have evidence for hypertension-related target organ damage, such as known ischemic heart disease, heart failure, left ventricular hypertrophy, cerebrovascular disease, hypertensive retinopathy, or chronic kidney disease?
Yes
No
Hypertension diagnosed
Have the patient perform home blood pressure monitoring*
Home blood pressure performed
Home blood pressure not possible
Is the mean home blood pressure ≥130 mmHg systolic and/or ≥80 mmHg diastolic?
Yes
No
Hypertension diagnosed
Possible white coat hypertension


Hypertension diagnosed
Have the patient perform home blood pressure monitoring*
Home blood pressure performed
Home blood pressure not possible
Is the mean home blood pressure ≥130 mmHg systolic and/or ≥80 mmHg diastolic?
Yes
No
Hypertension diagnosed
Possible white coat hypertension
Perform ABPM, if possible¶
ABPM performed
ABPM not possible
Is the mean daytime blood pressure by ABPM ≥130 mmHg systolic and/or ≥80 mmHg diastolic?
Yes
No
Hypertension diagnosed
White coat hypertension confirmed
Measure blood pressure in the office at least 3 times, spaced over a period of weeks to months△
Is the average office blood pressure ≥130 mmHg systolic and/or ≥80 mmHg diastolic?
Yes
No
Hypertension diagnosed
Not hypertensive