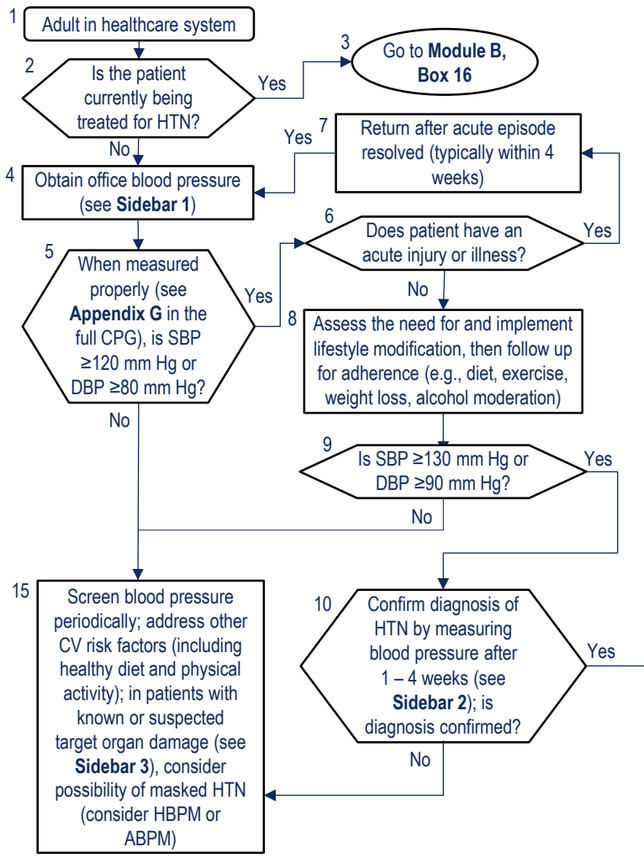
The Diagnosis and Management of Hypertension in the Primary Care Setting

VA/DoD Evidence-Based Practice

Module A: Screening and Diagnosis



Access to the full guideline and additional resources are available at the following link: https://www.healthquality.va.gov/guidelines/CD/htn/

Sidebar 1: Office Blood Pressure Measurement

AOBP (preferred)

- Fully automated machine programmed to wait five minutes and record the average of three measurements separated by at least 30 seconds

Standard Technique (alternative)

- Use a properly calibrated and validated sphygmomanometer
- Use an average of ≥2 readings

Sidebar 2: Confirm Diagnosis

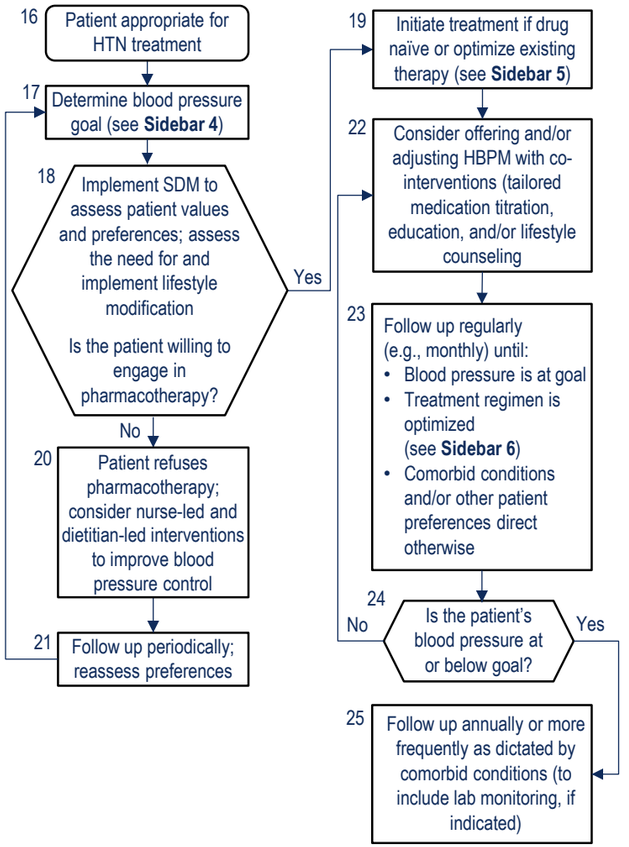
- If the follow-up clinic blood pressure value is ≥130 mm Hg SBP or ≥90 mm Hg DBP, make diagnosis of HTN without further testing
- Consider HBPM or ABPM to inform the diagnosis in select patients (see Recommendation 4 in the full CPG)
- If blood pressure is <130 mm Hg SBP and <90 mm Hg DBP, yet there is evidence of target organ damage, which may suggest the presence of masked HTN, consider HBPM or ABPM to inform the diagnosis (see Recommendation 4 in the full CPG)

Sidebar 3: Examples of Target Organ Damage and Comorbid Conditions*

- Target organ damage: stroke, MI, peripheral arterial disease, LVH, CHF, CKD, and retinopathy
- Comorbid conditions: CKD, dyslipidemia, diabetes, obesity/overweight, OSA, and tobacco dependence

*If patient has comorbid conditions, engage relevant clinical practice guidelines, when available (e.g., CKD[1], lipids[2], diabetes[3], obesity[4], etc.)

Module B: Treatment



Sidebar 4: Goals for Blood Pressure

Systolic Goal (see Recommendations 6 – 8 in the full CPG)

<130 mm Hg

- If less stringent goal is desired per clinical judgment and/or patient preference, aim for at least:
  - <150 mm Hg among patients age 60 and over
  - <140 mm Hg for patients age 60 and over with type 2 diabetes

Diastolic Goal (see Recommendation 9 in the full CPG)

<90 mm Hg for patients age 30 and above

Sidebar 5: Initiate Drug Therapy

General Population

- Recommend one or more of the following:
  - Thiazide-type diuretics
  - ACEIs or ARBs*
  - Long-acting CCBs
- For patients unlikely to achieve goal with monotherapy (e.g., patients with SBP/DBP of >20/10 mm Hg above goal), consider initiating treatment with combination therapy or monotherapy with close follow up for titration and/or addition of medications based on blood pressure response

Specific Populations:

- For patients age 65 and over, we suggest a thiazide-type diuretic for reduction in composite cardiovascular outcomes
- For African American patients, we recommend against using ACEIs or ARBs as monotherapy
- For patients with CKD, see VA/DoD CKD CPG1

*We recommend against more than one of the following three drug classes together in the same patient: ACEIs, ARBs, or direct renin inhibitors

1. See the VA/DoD Clinical Practice Guideline for the Management of Chronic Kidney Disease. Available at: https://www.healthquality.va.gov/guidelines/CD/CKD/
2. See the VA/DoD Clinical Practice Guideline for the Management of Dyslipidemia for Cardiovascular Risk Reduction. Available at: https://www.healthquality.va.gov/guidelines/CD/lipids/
3. See the VA/DoD Clinical Practice Guideline for the Management of Type 2 Diabetes Mellitus in Primary Care. Available at: https://www.healthquality.va.gov/guidelines/CD/diabetes/
4. See the VA/DoD Clinical Practice Guideline for Screening and Management of Obesity and Overweight. Available at: https://www.healthquality.va.gov/guidelines/CD/obesity/

Sidebar 6: Optimize Treatment

- Assess adherence
- Consider evaluating for interfering substances (some prescription medications, NSAIDs, alcohol, recreational drugs)
- Consider evaluating and addressing contributing lifestyle factors
- Optimize treatment (refer to Appendix F, Table F-1 in the full CPG)
  - Titrate initial drug
  - Add another agent from a different class
- Reevaluate diagnosis (resistant HTN, secondary causes of HTN)
- Consider specialty consultation for patients with resistant HTN
- Consider co-interventions to enhance management of HTN and improve blood pressure (pharmacist-led, nurse-led, dietitian-led)

Guidance Conducting Home Blood Pressure Measurement

Preparation
- Have an empty bladder; rest quietly, without talking or texting, in seated position with back supported for at least five minutes

Position
- Sit with back supported; keep both feet flat on the floor
- Cuff should be on bare arm; directly above the bend of the arm, pulled taut
- Center of the bladder of the cuff (commonly marked on the cuff) should be placed over the arterials pulsation of the patient's bare upper arm
- The arm with the cuff should be supported on a flat surface

Number of readings
- Take 2 readings at least 1 minute apart in the morning before any antihypertensive medications and 2 readings at least 1 minute apart in the evening before bed for a total of 4 readings

Duration of monitoring
- Preferred monitoring period is ≥7 days; a minimum period of 3 days may be sufficient, ideally in the period immediately before the next appointment

Analyzing readings
- For each monitoring period, average all of the readings
- If the first day of readings is excluded, as sometimes recommended, the minimum of preferred periods of HBPM should be 4 and 8 days, respectively

For more information about blood pressure measurements, see Appendix G and Appendix H in the full CPG. For a video with instructions on measuring blood pressure at home, please click on the "Home Blood Pressure Monitoring" video available at this link: https://www.healthquality.va.gov/guidelines/CD/htn/

Guidance Conducting Office Blood Pressure Measurement

Properly prepare the patient
- Have the patient relax, sitting in a chair with feet flat on floor and back supported for 3 – 5 minutes without talking or moving around before recording the first reading
- Avoid caffeine, exercise, and smoking for ≥30 minutes before measurement
- Ensure that the patient has emptied his/her bladder
- The patient nor the observer should talk during rest period or the measurement
- Remove clothing covering the location of cuff placement
- Sitting on an examining table does not fulfill these criteria

Use proper technique (attended or unattended, fully AOBP measurement is preferred)
- Use a validated upper-arm cuff measurement device that has been calibrated
- Support the patient's arm (e.g., resting on a desk)
- Position the middle of cuff on the patient's upper arm, level with the right atrium
- Use the correct cuff size so that the bladder encircles 75 – 100% of the upper arm

Take proper measurements needed
- At the first visit, record blood pressure in both arms; use the arm that gives the higher reading for subsequent readings (if consistently 10 – 15 mm Hg higher)
- Separate repeated measurements by ≥30 seconds

Properly document accurate blood pressure readings
- Record SBP and DBP
- Note the time of most recent blood pressure medication taken before measuring

Use average readings
- Average ≥2 readings for the visit blood pressure
- For initial documentation of the patient's blood pressure, use an average of the visit readings from ≥2 occasions to estimate the individual's blood pressure

Provide blood pressure readings to patient
- Provide patients their SBP/DBP readings both verbally and in writing; help the patient interpret the results

Abbreviations: A1c: glycated hemoglobin; ABPM: ambulatory blood pressure monitoring; ACEI: angiotensin-converting enzyme inhibitor; AOBP: automated office blood pressure; ARB: angiotensin II receptor blockers; AV: atrioventricular; CCB: calcium channel blocker; CHF: chronic heart failure; CKD: chronic kidney disease; cm: centimeter; CPG: clinical practice guideline; CV: cardiovascular; DASH: Dietary Approaches to Stop Hypertension; DBP: diastolic blood pressure; DHP: dihydropyridine; DoD: Department of Defense; EKG: electrocardiogram; HBPM: home blood pressure monitoring; Hg: mercury; HTN: hypertension; IR: immediate release; K+: potassium; LV: left ventricular; LVH: left ventricular hypertrophy; mg: milligram; MI: myocardial infarction; ml: milliliter; mm: millimeter; NSAIDs: nonsteroidal anti-inflammatory drugs; OSA: obstructive sleep apnea; SBP: systolic blood pressure; SDM: shared decision making; SR: sustained release; tbsp: tablespoon; VA: Department of Veterans Affairs

DASH Diet Protocol

Nutrient	Recommended Intake
Saturated fat	6% of total calories
Total fat	27% of total calories
Carbohydrate	55% of total calories
Dietary fiber	30 grams/day
Protein	18% of total calories
Cholesterol	150 mg/day
Total calories (energy)	Balance energy intake and expenditure to maintain desirable body weight/prevent weight gain

Mediterranean Diet Protocol

	Food Item	Goal
Recommended Items	Olive oil	≥4 tbsp per day
	Tree nuts and peanuts	≥3 servings per week
	Fresh fruits including natural fruit juices	≥3 servings per day
	Vegetables	≥2 servings per day
	Seafood (primarily fatty fish)	≥3 servings per week
	Legumes	≥3 servings per week
	Sofrito[a]	≥2 servings per week
	White meat	In place of red meat
	Wine with meals	≥7 glasses per week, for those who drink[b]
Discouraged Items	Soda drinks	<1 drink per day
	Commercial baked goods, sweets, pastries[c]	<3 servings per week
	Spread fats	<1 serving per day
	Red and processed meats	<1 serving per day

[a] Sofrito is a sauce made with tomato and onion, and often includes garlic, herbs, and olive oil
[b] Recommended wine volume per glass: 100 mL for women, 150 mL for men
[c] Commercial baked goods, sweets, and pastries included cakes, cookies, biscuits, and custard, and did not include those that are homemade

Select Antihypertensive Therapy[b]

	Select Medication[b]	Usual Dosage Range	Comments
Thiazide-Type Diuretics	Chlorthalidone	12.5 – 25 mg daily	• May cause hyperuricemia/ gout • Monitor K+ levels
	Hydrochlorothiazide	25 – 50 mg daily[c]	
ACEIs	Lisinopril	10 – 40 mg daily	• Avoid in pregnancy • Do not use if history of angioedema • Monitor K+ and kidney function
ARBs	Losartan	25 – 100 mg/day (daily or divided 2x/daily)	• Avoid in pregnancy • Monitor K+ and kidney function
	Valsartan	30 – 320 mg daily	
Long-acting CCBs: DHP CCBs	Amlodipine	2.5 – 10 mg daily	• May cause ankle edema, dizziness, flushing, headache, constipation
	Nifedipine SR	30 – 120 mg daily	
Long-acting CCBs: Non-DHP CCBs	Verapamil SR	120 – 480 mg/day (daily or divided 2x/daily)	• Verapamil may cause constipation; contraindicated in 2nd or 3rd degree AV block; severe LV dysfunction
	Diltiazem SR	120 – 540 mg daily	• Diltiazem may decrease sinus rate; contraindicated in 2nd or 3rd degree AV block; use with caution in LV dysfunction

[a] For complete drug information, review the manufacturer's prescribing information
[b] Drug classes recommended as primary pharmacologic therapy for HTN for reduction in composite CV outcomes; selected medications include those listed on the VA National Formulary and DoD Basic Core Formulary; refer to the full HTN CPG for treatment recommendations and additional medications information
[c] Hydochlorothiazide 12.5 mg may be considered as an initial dose with titration recommended to 25 – 50 mg daily; refer to Recommendation 25 and associated discussion in the full HTN CPG for further information