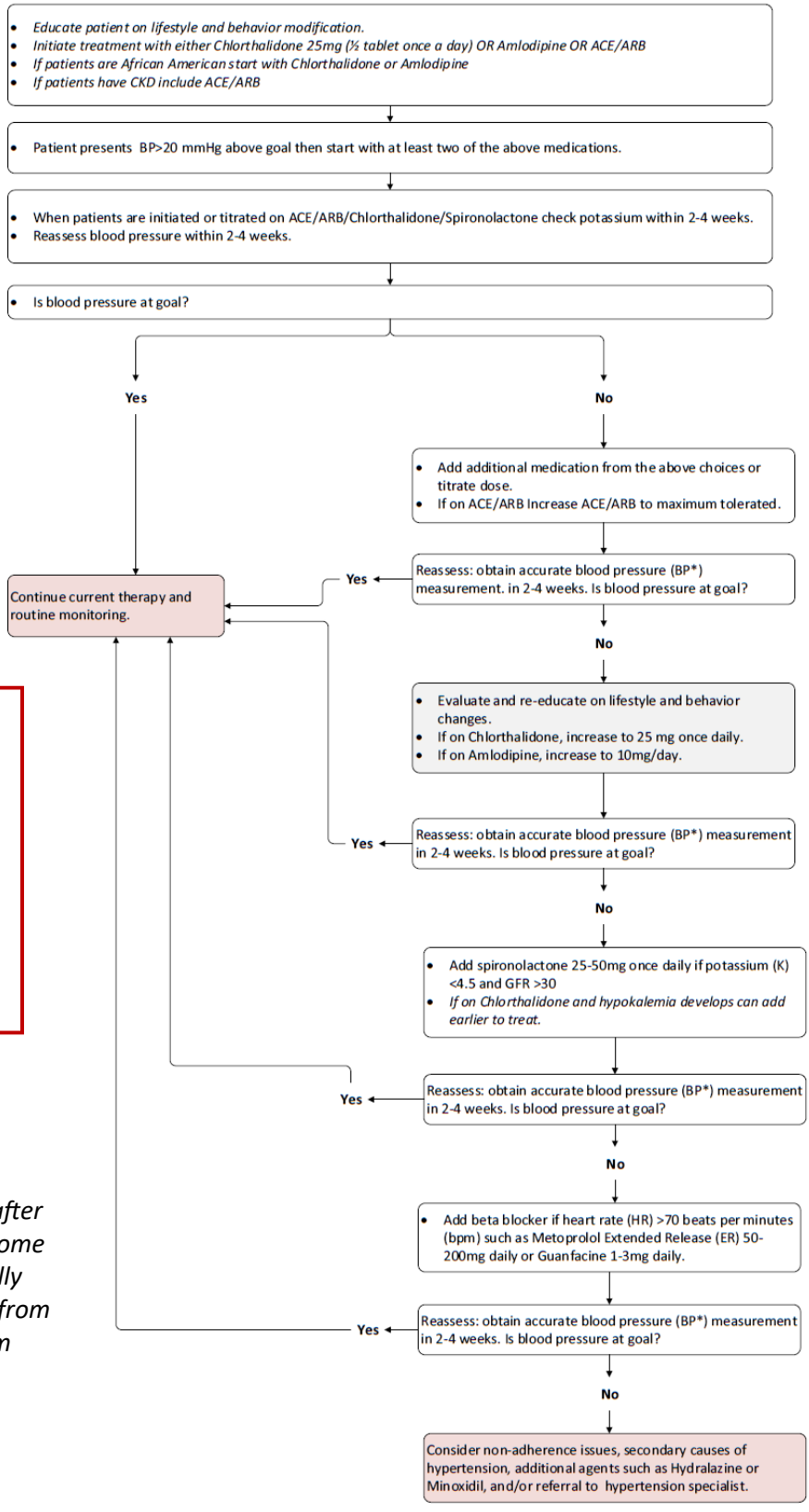
Quality Care Network

Clinical Practice Guideline

Hypertension (HTN)



**These Clinical Practice Guidelines are guidelines only. In no way should these Clinical Practice Guidelines be used as a substitute for clinical or medical judgment.*

**Accurate blood pressure (BP) measurement should be an in office automated BP reading after 5 minutes seated. Validated home BP readings either electronically submitted to practice directly from machine or reading taken from direct observation of machine memory reading*

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Hypertension (HTN)

According to Muntner, Carey, Gidding, Jones, Taler, Wright & Welton (2017), over 45% (103 million) US adults have high blood pressure (≥ 130/80) and more than 53% that take medicine still don't have their blood pressure controlled. The following Clinical Practice Guideline (CPG) was developed by UHQCN, UH Primary Care Institute and approved by the Quality Care Network Board. The goal of this guideline is to provide a care path to improve quality patient care outcomes. The UH Quality Care Network (UHQCN) and the physician-led board of directors developed and reviewed this Clinical Practice Guideline (CPG).

Why Worry About Blood Pressure?

- ✓ In the US, it accounts for more CVD deaths than any other modifiable CVD risk factor.
- ✓ It is second only to cigarette smoking as a preventable cause of death for any reason.
- ✓ It is the leading cause of heart failure, the leading DRG for hospitalizations and the most common reason for primary care visits.
- ✓ UH employee population. Blood pressure is the number one diagnosis of the UH employee population.
- ✓ Health professionals have influence. A review of 77 team-based care studies showed that patients' control of blood pressure improved when their care was provided by a team of health professionals.
- ✓ Supports Million Hearts. Million Hearts, a US Department of Health and Human Services initiative, is spearheaded by the CDC and CMS to prevent a million heart attacks and strokes.

Identifiable Causes of Hypertension

- ✓ Primary aldosteronism (frequent with type 2 diabetes patients)
- ✓ Obstructive sleep apnea
- ✓ Drug induced: cold medicines, some antidepressants, contraceptives
- ✓ Chronic kidney disease
- ✓ Renovascular disease
- ✓ Cushing's syndrome or steroid therapy
- ✓ Coarctation of aorta
- ✓ Thyroid/parathyroid disease

First visit

Take readings in both arms and use the highest arm for all future readings.

Healthy Lifestyle changes to help lower BP

- Reduce weight
- Adopt DASH eating plan
- Lower sodium intake <1500 mg sodium a day
- Exercise at least 30 minutes a day
- Limit ETOH consumption
- Quit smoking

New Guidelines: Goal: <130/80

Clinic	HBPM	24-Hour ABPM
120/80	120/80	115/75
130/80	130/80	125/75
140/90	135/85	130/80
160/100	145/90	145/90

Muntner et al, 2017

What is the importance of accurate BP measurement?

- Underestimating systolic blood pressure by 10mmHg, results in 10-40% increase in FATAL MIs and stroke
- 5% overestimation of blood pressure would un-necessarily increase treatment intensity in 30 million (USPS TaskForce & Scientific Statement published in HTN– add links/refer)

Need for Out of Office BP Readings

- ✓ Out of office BP readings are now considered essential for both the diagnosis of hypertension and confirmation of BP control (ACC/AHA/AAPA/ABC/ACPM/AGS/APhA/ASH/ASPC/NMA/PCNA, 2017).
- ✓ USPSTF (2015) recommends confirming elevated blood pressure readings outside of a clinical setting before a diagnosis of hypertension (USPS, 2017) .
- ✓ According to CMS (Decisions), "CMS (as of July 2019) will now reimburse for ABPM for initial diagnosis and annual f/u of MH/WCH in Medicare patients"
- ✓ Ohio Department of Medicaid and other insurers now cover home blood pressure monitoring (HBPM) devices.

Procedure for Measuring Blood Pressure

1. ***Automated Office Blood Pressure (AOBP) is preferred.***
2. ***If AOBP unavailable, then use manual blood pressure cuff.***
3. ***Inflate cuff rapidly to 30 mmHg above the number where the radial pulse disappeared.***
4. ***Then deflate at two to three mmHg per second.***
5. ***The first of two consecutive sounds is recorded.***

For Accurate Assessment

- ✓ **5 min rest in chair (not exam table)**
- ✓ **Keep blood pressure cuff <u>at heart level</u>**
- ✓ **Upper arm bare**
- ✓ **Arm supported**
- ✓ **Back supported**
- ✓ **Feet flat on the floor**

Support Self-Measured Blood Pressure Monitoring (SMBP)

The Agency for Healthcare Research and Quality (AHRQ) recently reviewed the effectiveness of SMBP. They found evidence that SMBP plus additional support was more effective than usual care in lowering blood pressure among patients with hypertension.

Comment elements of SMBP:

- ✓ Delivery of intervention by trained health care providers.
- ✓ Regular patient communication of SMBP readings to providers.
- ✓ A patient/provider "feedback loop" in which support and advice are customized based on patients' reported information.
- ✓ Encourage the patient to bring machine to each visit
    - ✓ Measure Blood Pressure (BP) twice a day for 5-7 days prior to appointment
- ✓ Patient's home BP monitor needs to be tested against a monitor that has been calibrated as required (e.g. office portable aneuroids need calibrated every 2 weeks, wall units every 6 months). Thus, make certain that discrepancies are due to improper readings in patient's monitor and not the office unit.

Accuracy Matters.

- **Timely and appropriate documentation has long term implications that affect the overall cost and quality of patient care.**
- **It is essential that the most appropriate and specific diagnosis codes are entered at each and every patient encounter.**

Diagnosis	ICD10 Code
Elevated BP reading without diagnosis of hypertension	**R03.0**
White coat syndrome without hypertension	**R03.0**
Hypertension	**I10**

Resources

When connected to the internet please click on the link in blue to be connected to the websites.

- ✓ Hypertension Toolkit contains resources that can be obtained from this link: https://targetbp.org/
  - 7 Day Recording Sheet
  - Consequences of High Blood Pressure Handout
  - How to Measure your blood pressure at home
  - SMBP Device Accuracy Test
  - What is SMBP?
- ✓ DASH
  - Patient Handout
  - Online Information
- ✓ According to CMS (Coverage), "CMS (as of July 2019) will now reimburse for ABPM for initial diagnosis and annual f/u of MH/WCH in Medicare patients:" https://www.cms.gov/medicare-coverage-database/details/nca-decision-memo.aspx?NCAId=294

Social Determinants of Health Assessment

In order to engage and empower patients to be active in their care, it is also necessary to assess Social Determinants of Health (SDOH). Patients can be unwillingly impacted by SDOH, which will affect a patient's capacity to adhere to their treatment plan. Keep this in mind and assess accordingly, to provide proper referrals to encircle the patient with support to achieve their optimal health.

Consider the following:

- Financial restrictions can impact a family's ability to afford nutritious foods and medications.
- Geography can impact accessibility of healthy and affordable food.
- The patient's own understanding and perceptions.
- Capacity to exercise as well as physical and behavioral limitations that may require referrals to physical therapy or exercise support.
- Patient may have behavioral and/or psychological barriers that may be influencing and perpetuating lifestyle habits.
- Health literacy and comprehension.

Resources

- AAFP Social Needs Screening Tool
- Greater Cleveland Foodbank
- United Way
  - 211
- UH Smoking Cessation
- ChooseMyPlate
- EatRight
- CoverMyMeds
- GoodRx

Oral Antihypertensive Medication List

Class	Drug	Usual Dose (mg / day)	Daily Frequency	Side Effects (SE) and Comments
Primary agents				
Thiazide or thiazide-type Diuretics Needs metabolic panel in 2-4 weeks if started or dose increased	Chlorthalidone	12.5-25	1	• SE: Increased urination, rash, hypokalemia • Chlorthalidone preferred on the basis of prolonged half-life, twice as potent and proven trial reduction of CVD • Doses of hydrochlorothiazide <25 mg have not been shown to reduce CV events • May worsen hyperuricemia/gout; use with caution in patients with history of acute gout unless patient is on uric acid–lowering therapy • May cause photosensitivity (rare)
	Hydrochlorothiazide	25-50	1	
ACE inhibitors Needs metabolic panel in 2-4 weeks if started or dose increased	Benazepril	10-40	1 or 2	• SE: Dry cough (ACE), hyperkalemia, increased creatinine • Increased risk of hyperkalemia in patients with CKD or in those on K^+ supplements or K^+-sparing drugs • Up to 30% increase in serum creatinine after initiation of therapy is expected • Risk of acute renal failure in patients with severe bilateral renal artery stenosis • Do not use combination of ACE inhibitors, ARBs or direct renin inhibitors with each other • Do not use in history of angioedema with ACE inhibitors • Avoid in pregnancy
	Enalapril	5-40	1 or 2	
	Lisinopril	10-40	1	
	Ramipril	2.5-20	1 or 2	
ARBs Needs metabolic panel in 2-4 weeks if started or dose increased	Candesartan	8-32	1	
	Irbesartan	150-300	1	
	Losartan	50-100	1 or 2	
	Olmesartan	20-40	1	
	Telmisartan	20-80	1	
	Valsartan	80-320	1	
CCB: dihydropyridines	Amlodipine	2.5-10	1	• SE: Dose related pedal edema, headache • Avoid use in patients with HFrEF; amlodipine or felodipine may be used if required
	Felodipine	2.5-10	1	
	Nicardipine SR	60-120	2	
	Nifedipine LA	30-90	1	
CCB: nondihydropyridines	Diltiazem ER	240-480	1	• SE: Bradycardia, constipation (verapamil) • Avoid routine use with beta blockers because of increased risk of bradycardia and heart block • Do not use in patients with HFrEF. • There are drug interactions with diltiazem and verapamil (CYP3A4 major substrate and moderate inhibitor)
	Verapamil IR	120-360	3	
	Verapamil SR	30-90	1 or 2	

Secondary Agents				
Aldosterone Antagonists Needs metabolic panel in 2-4 weeks if started or dose increased	Eplerenone	50-100	1 or 2	• SE: Hyperkalemia, increased creatinine, gynecomastia • Preferred agents in primary aldosteronism and resistant hypertension • Eplerenone may provide less frequency of gynecomastia and impotency, but is more expensive • Avoid use with K^+-supplements, other K^+-sparing diuretics, or significant renal dysfunction
	Spironolactone	25-50	1	
Beta blockers: cardioselective	Bisoprolol	2.5-10	1	• SE: Fatigue (usually improves after a few weeks), bradycardia • Not recommended as first-line agents unless the patient has IHD or HF • Bisoprolol, metoprolol succinate and carvedilol are preferred in patients with HFrEF • Avoid abrupt cessation; discontinue with slow taper • As dose increases, cardioselectivity decreases
	Metoprolol tartrate	100-200	2	
	Metoprolol succinate	50-200	1	
Beta blockers: combined alpha- and beta-receptor	Carvedilol	12.5-50	2	
	Carvedilol CR	20-80	1	
	Labetalol	200-800	2	
Alpha-1 blockers	Doxazosin	1-16	1	• SE: orthostatic hypotension • Use with caution in older adults • May be considered as second-line agent in patients with concomitant BPH
	Terazosin	1-20	1 or 2	
Central alpha2-agonist and other centrally acting drugs	Clonidine oral	0.1-0.8	2	• SE: sedation, dry mouth • Generally reserved as last-line because of significant CNS adverse effects, especially in older adults • Avoid abrupt discontinuation of clonidine, which may induce hypertensive crisis; clonidine must be tapered to avoid rebound hypertension
	Clonidine patch	0.1-0.3	1 weekly	
	Guanfacine	0.5-2	1	
Direct vasodilator	Hydralazine	100-200	2 or 3	• SE: headache, edema, reflex tachycardia • Associated with sodium and water retention and reflex tachycardia; use with a diuretic and beta blocker • Hydralazine is associated with drug-induced lupus-like syndrome at higher doses

This list is not inclusive of all blood pressure agents

Adapted from Whelton et al., 2017 High Blood Pressure Clinical Practice Guideline

For assistance in scheduling appointments consider using the provider app.

UH4CARE

- Call 1-800-UH4-CARE to schedule an appointment with a UH Quality Care Network Provider

UH Provider App

- On your telephone or mobile device, download the UH Provider App
- Use this App to refer to a specialist

References

Muntner P, Carey RM, Gidding S, Jones DW, Taler SJ, Wright JT Jr, Whelton PK. Potential US population impact of the 2017 American College of Cardiology/American Heart Association Hypertension Guideline. Circulation 2018 Jan 9, 137(2):109-118 doi. 10.1161/circulationAHA 117.032582. Eupub 2017 Nov 13.)

2017 ACC/AHA/AAPA/ABC/ACPM/AGS/APhA/ASH/ASPC/NMA/PCNA Guideline for the Prevention, Detection, Evaluation, and Management of High Blood Pressure in Adults. A Report of the American College of Cardiology/American Heart Association Task Force on Clinical Practice Guidelines. Paul K. Whelton, Robert M. Carey, Wilbert S. Aronow, Donald E. Casey Jr., Karen J. Collins, Cheryl Dennison Himmelfarb, Sondra M. DePalma, Samuel Gidding, Kenneth A. Jamerson, Daniel W. Jones, Eric J. MacLaughlin, Paul Muntner, Bruce Ovbiagele, Sidney C. Smith Jr., Crystal C. Spencer, Randall S. Stafford, Sandra J. Taler, Randal J. Thomas, Kim A. Williams Sr., Jeff D. Williamson and Jackson T. Wright Jr. http://www.onlinejacc.org/content/accj/71/19/2199.full.pdf

CMS (2019). Decision Memo for Ambulatory Blood Pressure Monitoring (ABPM) (CAG-00067R2) Retrieved from: https://www.cms.gov/medicare-coverage-database/details/nca-decision-memo.aspx?NCAId=294

Final Recommendation Statement: High Blood Pressure in Adults: Screening. U.S. Preventive Services Task Force. September 2017. https://www.uspreventiveservicestaskforce.org/Page/Document/RecommendationStatementFinal/high-blood-pressure-in-adults-screening#Pod1

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