Status **Active** PolicyStat ID **16977421**

Origination	12/2024
Last Approved	12/2024
Effective	12/2024
Last Revised	12/2024
Next Review	12/2025

Owner	Katie Egan: Manager, Health Plan Quality Improvement
Document Area	All Lines of Business
Applicability	Denver Health Medical Plan (DHMP)
Document Types	Guideline / Clinical Care Guideline

Management of Hypertension in Adult Outpatients Guideline

Clinical Care Guideline

PURPOSE

The purpose of this guideline is to outline the basic principles of treatment and monitoring of adult patients with essential hypertension (HTN).

Observational studies have demonstrated and increased risk of cardiovascular disease (CVD) with elevates in both systolic blood pressure (SBP) and diastolic blood pressure (DBP). The 2017 ACC/AHA Hypertension (HTN) Clinical Practice Guidelines created new staging criteria and now 46% of US adults are estimated to have HTN. Meta-analyses of HTN clinical trials have shown a doubling of the risk of death from stroke, heart disease, or vascular disease with increases of SBP by 20 mm Hg and DBP by 10 mm Hg. The increased risk of CVD associated with higher SBP and DBP has been reported in individuals from 30 years of age to greater than 80 years of age. The benefit of lowering BP has been demonstrated across all stages of HTN. Since HTN affects such a large population, these guidelines were developed in order to assist providers in the management of the disease.

INCLUSION CRITERIA

Adult patients with essential hypertension.

RESPONSIBILITY

Primary Care Providers.

GUIDELINE

A. General Treatment Approach:

1. The goals for blood pressure control are adopted from the 2017 ACC/AHA guidelines, Reference A. The **ideal** blood pressure target is <130/80 for most patients but the provider should individualize therapy based on CVD risk and potential side effects.
2. Nonpharmacologic interventions to reduce BP include:
    a. Weight loss for overweight or obese patients (best goal is to achieve ideal body but aim for at least a 1 kg reduction which can lead to a 1 mm Hg for every 1 kg reduction)
    b. Heart healthy diet (e.g., DASH diet)
    c. Sodium restriction (goal of less than 1500 mg/day)
    d. Potassium supplementation within the diet (goal of 3500 to 5000 mg/day)
    e. Increased physical activity with a structured exercise program. (90 - 150 minutes per week)
    f. Men should be limited to no more than 2 and women no more than 1 standard alcohol drink(s) per day.
    g. The usual impact of each lifestyle change is a 4-5 mm Hg decrease in SBP and 2-4 mm Hg decrease in DBP.
3. Use of BP-lowering medications is recommended for the following groups (See Appendix C)
    a. Secondary prevention of CVD events in patients with clinical CVD and an average SBP ≥130 mm Hg or a DBP ≥80 mm Hg
    b. Primary prevention in adults with no history of CVD but with an estimated 10-year ASCVD risk of ≥10% and SBP ≥130 mm Hg or DBP ≥80 mm Hg.

B. Drug Therapy.

1. Drug Therapy Approach
    a. Initial first-line therapy for **stage 1** hypertension includes thiazide diuretics, CCBs, and ACE inhibitors or ARBs without compelling indications .
        i. Chlorthalidone (12.5-25 mg) is the preferred diuretic because of long half-life and proven reduction of CVD risk.
        ii. Other potential initial treatment choices include ACE Inhibitor (e.g., lisinopril) and calcium channel blockers (CCBs; e.g., long acting dihydropyridines such as amlodipine).
        iii. Consider low dose combination therapy (lisinopril/

hydrochlorothiazide (HCTZ) 10/12.5 mg or irbesartan/HCTZ 150/12.5 mg) as the initial drug. Combinations have been shown to be more effective, to increase adherence and are associated with fewer adverse events.

iv. Unless a patient has specific compelling indication, monotherapy with beta blockers (BBs) is not recommended, especially in patients over 60 years.

v. Add-on choices:

a. A second drug from a different class should be added when the first drug, given in adequate doses, does not control BP. ACE Inhibitors (e.g., lisinopril): Lisinopril/HCTZ combination product is available and may help increase adherence.

b. ARB (e.g., irbesartan): Irbesartan/HCTZ combination product is available and may help increase adherence.

c. Long-acting dihydropyridines CCB, (e.g., amlodipine, felodipine), are probably more effective in lowering BP then non-dihydropyridines (i.e., verapamil and diltiazem).

d. Beta-blockers: Traditional selective beta-blockers (e.g., metoprolol, atenolol) are probably not as effective for lowering BP and less tolerated then those with dual alpha/beta blockade such as labetalol or carvedilol.

b. Two first-line drugs of different classes are recommended with **stage 2** hypertension and average BP of 20/10 mm Hg above the BP target.

i. Improved adherence can be achieved with once-daily drug dosing, rather than multiple dosing, and with combination therapy rather than administration of the free individual components.

ii. A diuretic such as hydrochlorothiazide or chlorthalidone should be part of the regimen.

2. Special Populations

a. For adults with confirmed hypertension and known established CVD or ≥10% 10-year ASCVD risk, a BP target of <130/80 mm Hg is recommended.

i. First-line therapy includes thiazide diuretics, CCBs, and ACE inhibitors or ARBs.

b. For adults with confirmed hypertension and known established CVD, a BP target of <130/80 mm Hg is recommended.

i. The strategy is to first follow guideline directed medical therapy for coronary artery disease (CAD), heart failure with reduced

ejection fraction (HFrEF), previous myocardial infarction (MI), and stable angina, with the addition of other drugs as needed to further control BP.

c. For adults with HFrEF or heart failure with preserved ejection fraction (HFpEF), a BP target of < 130/80 mm Hg is recommended
    i. With symptoms of volume overload, diuretics should be used to control hypertension, then titration with ACE inhibitors or ARBs and beta-blockers
    ii. Aldosterone antagonists (i.e., spironolactone, eplerenone) should be considered after maximizing ACE inhibitors or ARB plus beta-blockers.

d. For adults with chronic kidney disease (CKD), a BP goal should be <130/80 mm Hg. In those with stage 3 or higher CKD or stage 1 or 2 CKD with albuminuria (>300 mg/day)
    i. ACE inhibitor or ARB is reasonable to slow progression of kidney disease and should be initiated if presence of albuminuria.
    ii. Loop diuretics may be preferred especially if the GFR <30 ml/min.

e. For adults with stroke and cerebral vascular disease are complex, a BP goal should be < 130/80 mm Hg for most patients
    i. It is important to recognize the acuity of stroke and stroke type which have not been fully studied in clinical trials.
    ii. Blood pressure control in the setting of an acute cerebrovascular event is not in the scope of this guideline.
    iii. Secondary prevention following a stroke or transient ischemic attack (TIA) should begin by restarting treatment after the first few days of the index event to reduce recurrence.
        a. ACE inhibitor or ARB with thiazide diuretic is useful.
        b. Selection of drugs should be based on comorbidities. A goal of <130/80 mm Hg may be reasonable for those with a stroke, TIA, or lacunar stroke.

f. For adults with diabetes mellitus (DM) and hypertension, a BP goal should be < 130/80 mm Hg
    i. Antihypertensive drug treatment should be initiated at a BP ≥130/80 mm Hg with a treatment goal of <130/80 mm Hg.
    ii. All first-line classes of antihypertensive agents (i.e., diuretics, ACE inhibitors, ARBs, CCBs) are useful and effective. ACE inhibitors or ARBs may be considered in the presence of albuminuria.

g. For non-institutionalized ambulatory community dwelling older adults (>

65 years of age), SBP target of < 130 mm Hg is recommended

i. Antihypertensive drug treatment should be initiated at a SBP ≥130 mm Hg

ii. In patients with high burden of comorbidities and limited life expectancy, clinical judgment, patient preference, and team based approaches to assess risk/benefit is reasonable for decisions regarding intensity of BP lowering and choice of BP medication.

C. Specific Drug Considerations

1. Angiotensin-converting enzyme (ACE) inhibitors, angiotensin-receptor blockers (ARBs), and direct renin inhibitors should not be used in combination.
    a. ACE inhibitors, ARBs and renin inhibitors should be discontinued during pregnancy.
    b. ACE inhibitors, ARBs and renin inhibitors increase the risk of hyperkalemia in CKD and with supplemental K^+ or K^+-sparing drugs.
2. Dihydropyridine calcium channel blockers (CCB) (e.g., amlodipine) can cause edema.
3. Non-dihydropyridine CCBs are associated with bradycardia and heart block and should be avoided in HFrEF.
4. Loop diuretics are preferred in HF if fluid overload is present or when glomerular filtration rate (GFR) is <30 ml/min.
5. Amiloride and triamterene can be used with thiazides in adults with low serum K+, but should be avoided with GFR <45 ml/min.

D. Monitoring and follow-up:

1. Patients should be seen monthly during initiation of therapy until they reach their goal in order to evaluate response, side effects, and laboratory monitoring as necessary. Consider Home Blood Pressure monitoring (Attachment B) to encourage self-engagement and to aid in managing blood pressures virtually.
2. Potassium and serum creatinine should be checked 1-2 times per year without BP medication changes and more frequently if BP medication changes are made to diuretics or renin-angiotension-aldosterone system (RAAS) inhibitors.
3. Once BP is at goal and is stable, patients should follow-up at 3-6 month intervals.
4. Resistant HTN (see Attachment D): Defined as BP that remains above goal in spite of the concurrent use of 3 antihypertensive agents of different classes. Ideally, one of the 3 agents should be a diuretic and all agents should be prescribed at optimal dose amounts. Tables 2 and Attachment D ACC/AHA guidelines, 2019 (Reference T).
    a. Assess adherence, optimizing utilization of combination products to improve adherence to medications
    b. Consider other medications that may be interfering with BP control (see Table 2 below).

c. Consider secondary causes of HTN

d. Antihypertensive Modification Options

    i. Consider switching from HCTZ to chlorthalidone.

    ii. Consider changing from beta-blocker to mixed alpha/beta-blocker (labetalol or carvedilol).

    iii. Consider adding spironolactone to the regimen.

e. Consider home BP monitoring with a validated home BP cuff or ambulatory monitoring to evaluate for white coat HTN. It is very important to teach the patient correct technique for home BP monitoring (See Attachment B).

Table 2: Medications That Can Interfere with Blood Pressure Control
• Non-narcotic analgesics (NSAIDs including ASA, COX-2 inhibitors) • Sympathomimetic agents (decongestants, diet pills, cocaine) • Stimulants (methylphenidate, desmethylphenidate, dextroamphetamine, amphetamine, methamphetamine, modafinil) • Caffeine • Alcohol • Oral Contraceptives • Immunosuppressants (Cyclosporine) • Systemic corticosteroids • Angiogenesis inhibitors (e.g., bevacizumab) • Tyrosine kinase inhibitors (e.g., sunitinib, sorafenib) • Antidepressants (e.g., MAOIs, SNRIs, TCAs) • Erythropoietin • Natural licorice • Herbal compounds (e.g., ephedra or ma huang)

5. Hypertension in women (Reference A):

    a. As there are a number of anti-hypertensive medications which are not safe or well-studied in pregnancy, providers should ensure that women of child-bearing potential are using adequate contraception when starting treatment.

    b. Oral contraceptives:

        i. May increase BP; the risk of HTN increases with duration of use so BP should be checked regularly.

ii. Development of HTN is a reason to consider other forms of contraception.

iii. Hormone replacement therapy (HRT) does not raise BP.

c. Hypertension and Pregnancy:

i. There is a physiological decrease in BP during pregnancy. Thus, women with well-controlled HTN prior to their pregnancy on a single anti-hypertensive agent can often discontinue medication during pregnancy. The American Congress of Obstetricians and Gynecologists (ACOG) recommends initiating anti-hypertensive therapy for BP 150-160/100-110 mmHg.

ii. Patients with HTN should be referred to high risk obstetrics for pre-natal care because of the increased risks to mother and fetus.

iii. Women with HTN who become pregnant should be transitioned to methyldopa, nifedipine, or labetalol during pregnancy

iv. Medications:

a. Preferred medications included: Methyldopa, labetolol, and extended release nifedipine.

b. Diuretics such as HCTZ are not considered to be teratogenic but are generally discontinued because their effects are often attenuated in pregnancy.

c. ACEI and ARBs should not be used during pregnancy because of the potential for fetal defects and should be avoided in women who are likely to become pregnant.

v. Preeclampsia:

a. Occurs after the 20 th week of pregnancy, is characterized by new-onset or worsening HTN, albuminuria, hyperuricemia, and sometimes coagulation abnormalities.

b. May develop into a hypertensive urgency or emergency and may require hospitalization, intensive monitoring, early fetal delivery, and parenteral antihypertensive and anticonvulsant therapy.

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DHMP/DHHA RELATED DOCUMENTS

Clinical Practice and Preventive Care Guidelines

This Clinical Care Guideline is intended to assist care providers in the provision of patient care. This document serves as a guide, and is not a substitute for independent medical decision-making.

Attachments

ATTACHMENT A: Detection of White Coat Hypertension

ATTACHMENT B: Procedures for use of Home Blood Pressure Monitors (HBPM)

ATTACHMENT C: Blood Pressure Thresholds and Recommendations for Treatment

ATTACHMENT D: Treatment Algorithm for Management of Adult Patients with Resistant Hypertension

Approval Signatures

Step Description	Approver	Date

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Applicability

Denver Health Medical Plan (DHMP)