

Management of Adult Hypertension

Purpose

To identify and promote the essential elements of management of adult hypertension.

Key Recommendations

- Treat to blood pressure (BP) target levels:
 - <140/90 mm Hg for ages <60
 - <150/90 mm Hg for ages ≥60 years with no diabetes and no kidney disease^{1,2}
- Prescribe life style modifications (e.g. effectiveness of 1,600 mg sodium DASH eating plan can be equivalent to drug monotherapy).
- Initial antihypertensive treatment:
 - In general nonblack population, including those with diabetes, initial antihypertensive treatment should include a thiazide-type diuretic, calcium channel blocker (CCB), angiotensin-converting enzyme inhibitor (ACEI), or angiotensin receptor (ARB).
 - In the general black population, including those with diabetes, initial antihypertensive treatment should include a thiazide-type diuretic or CCB.³
 - In the population aged ≥ 18 years with CKD (including all CKD patients with hypertension regardless of race or diabetes status), initial (or add-on) antihypertensive treatment should include an ACEI or ARB to improve kidney outcomes.

Measures/Implementation

- Treat to blood pressure (BP) target levels:
 - <140/90 mm Hg for ages <60
 - <150/90 mm Hg for ages ≥60 years with no diabetes and no kidney disease^{1,2}
- Prescribe life style modifications (e.g. effectiveness of 1,600 mg sodium DASH eating plan can be equivalent to drug monotherapy).
- Initial antihypertensive treatment:
 - In general nonblack population, including those with diabetes, initial antihypertensive treatment should include a thiazide-type diuretic, calcium channel blocker (CCB), angiotensin-converting enzyme inhibitor (ACEI), or angiotensin receptor (ARB).
 - In the general black population, including those with diabetes, initial antihypertensive treatment should include a thiazide-type diuretic or CCB.³
 - In the population aged ≥ 18 years with CKD (including all CKD patients with hypertension regardless of race or diabetes status), initial (or add-on) antihypertensive treatment should include an ACEI or ARB to improve kidney outcomes.

High Risk Populations/Disparities

- In African Americans, hypertension is more common, more severe, develops at an earlier age and leads to more clinical sequelae than in age-matched non-Hispanic Whites.
- In Monroe County, in 2012, 32% of all adults have high blood pressure (41% of those ages 35 and older). Differences by residence (city/suburbs) and race/ethnicity: City/Suburbs - 50% vs. 39%; African American/White - 64% vs. 39%; Latino/White - 42% vs. 39%.
- In a national survey from 2011 - 2012: men and women had similar prevalence and awareness of hypertension, but more women than men were treating their hypertension and had it under control; young adults (18-39) have lower awareness, treatment, and control of their hypertension compared with older adults; prevalence was still highest among non-Hispanic black adults but awareness, treatment, and control of hypertension were similar among non-Hispanic black, non-Hispanic white, and Hispanic adults.

Footnotes:

1. National Committee for Quality Assurance (NCQA). HEDIS 2015: Healthcare Effectiveness Data and Information Set: The percentage of members 18-85 years of age who had a diagnosis of hypertension (HTN) and whose BP was adequately controlled during the measurement year using the following criteria: Members 18-59 years of age whose BP was <140/90 mm Hg; Members 60-85 years of age without a diagnosis of diabetes whose BP was <150/90 mm Hg. (HEDIS measure also used for Medicare Star Ratings.).
2. If hypertensive patient is already controlled in lower achieved SBP (eg, <140 mm Hg), treatment does not need to be adjusted.
3. 2014 ADA Standard of Medical Care: Pharmacological therapy for patients with diabetes and hypertension should comprise a regimen that includes either an ACE inhibitor or an angiotensin receptor blocker (ARB). If one class is not tolerated, the other should be substituted.

Guidelines are intended to be flexible. They serve as reference points or recommendations, not rigid criteria. Guidelines should be followed in most cases, but there is an understanding that, depending on the patient, the setting, the circumstances, or other factors, care can and should be tailored to fit individual needs.



Management of Adult Hypertension

Identification and Evaluation

Blood Pressure Measurement Techniques	
Method	Notes
In-Office	Two readings, 5 minutes apart, sitting in chair. Confirm elevated reading in contralateral arm. Ensure proper cuff size and measurement at heart level.
Ambulatory BP Monitoring	Option as a diagnostic approach in patients with apparent drug resistance, hypotensive symptoms while on treatment, labile or episodic hypertension, or autonomic dysfunction, when self-measured blood pressure readings have not provided sufficient clinical information for treatment and when results will impact treatment decisions.
Patient Self -Check	Provides information on response to therapy. May help improve adherence to therapy and is useful for evaluating “white coat hypertension.” Validate patient technique and cuff accuracy with home cuff in office.
Causes of Resistant Hypertension	
<ul style="list-style-type: none"> • Improper BP measurement • Excess sodium intake • Inadequate diuretic therapy • Medication <ul style="list-style-type: none"> ○ Inadequate doses ○ Drug actions and interactions (e.g., nonsteroidal anti-inflammatory drugs (NSAIDs), illicit drugs, sympathomimetics, oral contraceptives) ○ Over-the-counter (OTC) drugs and herbal supplements • Excess alcohol intake • Identifiable causes of hypertension 	
Compelling Indications for Individual Drug Classes	
Compelling Indication	Initial Therapy Options
Heart Failure	THIAZ, BB, ACEI / ARB, ALDO ANT
Post myocardial infarction	BB, ACEI / ARB, ALDO ANT
High CVD risk	THIAZ, ACEI / ARB, CCB
Diabetes	THIAZ, ACEI / ARB, CCB
Chronic kidney disease	ACEI / ARB
Recurrent stroke prevention	THIAZ, ACEI / ARB
Key: THIAZ= thiazide diuretic, ACEI= angiotensin converting enzyme inhibitor, ARB= angiotensin receptor blocker, BB = beta blocker, CCB = calcium channel blocker, ALDO ANT = aldosterone antagonist	
Strategies for Improving Adherence to Therapy	
<ul style="list-style-type: none"> • Clinician empathy increases patient trust, motivation, and adherence to therapy. • Physicians should consider their patients’ cultural beliefs and individual attitudes in formulating therapy. 	

Adapted from Reference Card from the U.S. Department of Health and Human Services, National Institutes of Health, National Heart Lung and Blood Institute, National High Blood Pressure Education Program, Seventh Report of the Joint National Committee on Prevention, Detection, Evaluation, and Treatment of High Blood Pressure (JNC7). With Modifications per AHA Scientific Statement; May 14, 2007, NIH Publication No. 03-5231 May 2003.

Guidelines are intended to be flexible. They serve as reference points or recommendations, not rigid criteria. Guidelines should be followed in most cases, but there is an understanding that, depending on the patient, the setting, the circumstances, or other factors, care can and should be tailored to fit individual needs.



Management of Adult Hypertension

Lifestyle Modifications

Principles of Lifestyle Modification		
<ul style="list-style-type: none"> • Encourage healthy lifestyles for all individuals. • Prescribe lifestyle modifications for all patients with prehypertension and hypertension. • Components of lifestyle modifications include weight reduction, DASH eating plan, dietary sodium reduction, aerobic physical activity, smoking cessation, and moderation of alcohol consumption. 		
Lifestyle Modification Recommendations		
Modification	Recommendation	AVG. SBP Reduction Range (+)
Weight Reduction	Maintain normal body weight (BMI 18.5 - 24.9 kg/m ²)	5 - 20 mmHg/10 kg
DASH eating plan	Adopt a diet rich in fruits, vegetables, and low fat dairy products with reduced content of saturated and total fat.	8 -14 mmHg
Dietary Sodium Reduction	Reduce dietary sodium intake to <100 mmol per day (2.4 g sodium or 6 g sodium chloride). Decrease consumption processed foods, fast-food and/or restaurant foods.	2 - 8 mmHg
Aerobic physical activity	Regular aerobic physical activity (e.g., brisk walking) at least 30 minutes per day, most days of the week.	4 -9 mmHg
Moderation of alcohol consumption	Men: Limit to ≤ 2 drinks * per day. Women and lighter weight persons: limit to < 1 drink * per day.	2 -4 mmHg

(+) Effects are dose and time dependent.

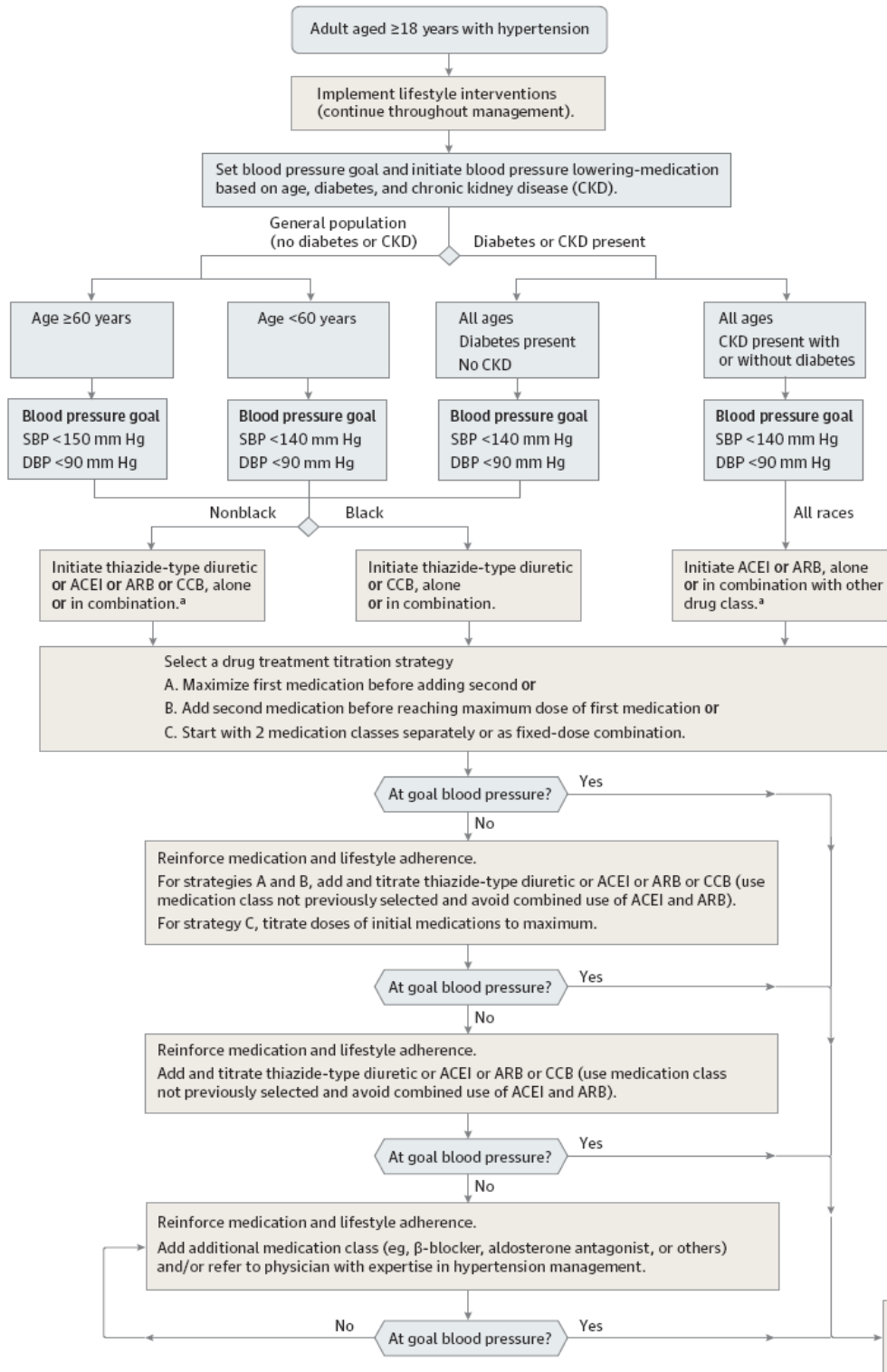
(*) 1 drink = ½ oz or 15 mL ethanol (e.g., 12 oz beer, 5 oz. wine, 1.5 oz 80-proof whiskey).

Adapted from Reference Card from the U.S. Department of Health and Human Services, National Institutes of Health, National Heart Lung and Blood Institute, National High Blood Pressure Education Program, Seventh Report of the Joint National Committee on Prevention, Detection, Evaluation, and Treatment of High Blood Pressure (JNC7). With Modifications per AHA Scientific Statement; May 14, 2007, NIH Publication No.03-5231 May 2003.

Guidelines are intended to be flexible. They serve as reference points or recommendations, not rigid criteria. Guidelines should be followed in most cases, but there is an understanding that, depending on the patient, the setting, the circumstances, or other factors, care can and should be tailored to fit individual need.

Management of Adult Hypertension

Treatment Algorithm



SBP indicates systolic blood pressure; DBP, diastolic blood pressure, ACEI, angiotensin-converting enzyme; ARB, angiotensin receptor blocker; and CCB, calcium channel blocker.

^aACEIs and ARBs should not be used in combination.

^bIf blood pressure fails to be maintained at goal, reenter the algorithm where appropriate based on the current individual therapeutic plan.

Management of Adult Hypertension

Strategies to Dose Antihypertensive Drugs

Table 5. Strategies to Dose Antihypertensive Drugs

Strategy	Description	Details
A	Start one drug, titrate to maximum dose, and then add a second drug	If goal BP is not achieved with the initial drug, titrate the dose of the initial drug up to the maximum recommended dose to achieve goal BP If goal BP is not achieved with the use of one drug despite titration to the maximum recommended dose, add a second drug from the list (thiazide-type diuretic, CCB, ACEI, or ARB) and titrate up to the maximum recommended dose of the second drug to achieve goal BP If goal BP is not achieved with 2 drugs, select a third drug from the list (thiazide-type diuretic, CCB, ACEI, or ARB), avoiding the combined use of ACEI and ARB. Titrate the third drug up to the maximum recommended dose to achieve goal BP
B	Start one drug and then add a second drug before achieving maximum dose of the initial drug	Start with one drug then add a second drug before achieving the maximum recommended dose of the initial drug, then titrate both drugs up to the maximum recommended doses of both to achieve goal BP If goal BP is not achieved with 2 drugs, select a third drug from the list (thiazide-type diuretic, CCB, ACEI, or ARB), avoiding the combined use of ACEI and ARB. Titrate the third drug up to the maximum recommended dose to achieve goal BP
C	Begin with 2 drugs at the same time, either as 2 separate pills or as a single pill combination	Initiate therapy with 2 drugs simultaneously, either as 2 separate drugs or as a single pill combination. Some committee members recommend starting therapy with ≥ 2 drugs when SBP is >160 mm Hg and/or DBP is >100 mm Hg, or if SBP is >20 mm Hg above goal and/or DBP is >10 mm Hg above goal. If goal BP is not achieved with 2 drugs, select a third drug from the list (thiazide-type diuretic, CCB, ACEI, or ARB), avoiding the combined use of ACEI and ARB. Titrate the third drug up to the maximum recommended dose.

Abbreviations: ACEI, angiotensin-converting enzyme; ARB, angiotensin receptor blocker; BP, blood pressure; CCB, calcium channel blocker; DBP, diastolic blood pressure; SBP, systolic blood pressure.

James P, Oparil S, Carter B, Cushman W, Dennison-Himmelfarb C, Handler J, et al. 2014 Evidence-Based Guideline for the Management of High Blood Pressure in Adults Report From the Panel Members Appointed to the Eighth Joint National Committee (JNC 8). JAMA. 2014;311(5):507-520. Available from: <http://jama.jamanetwork.com/article.aspx?articleid=1791497> (Permission granted from JAMA to use Table 5. Strategies to Dose Antihypertensive Drugs)

Guidelines are intended to be flexible. They serve as reference points or recommendations, not rigid criteria. Guidelines should be followed in most cases, but there is an understanding that, depending on the patient, the setting, the circumstances, or other factors, care can and should be tailored to fit individual needs.

Management of Adult Hypertension

Physician Resources for Patients

Academy of Nutrition and Dietetics – Five steps to manage high blood pressure

- Find a registered dietician – Find a registered dietician in your area.

American Heart Association/American Stroke Association – Heart360® - offers online tool to help patients manage blood pressure. Physicians can connect with their patients and monitor progress.

Center for Disease Control and Prevention

- Million Hearts® Campaign - Provides resources to help individuals, health care professionals, and organizations to help prevent and control high blood pressure.
 - Blood Pressure Toolkit – designed to be used with patients to help address high blood pressure in clinics and communities.
 - Spanish Language Toolkit and Resources
 - Facebook
 - Self-Measured Blood Pressure Monitoring Action Guide – Guidance for monitoring patients' blood pressure in between office visits
- Sodium Intake Widget - a CDC.gov application that displays content directly on your physician practice websites. There's no technical maintenance. CDC.gov will update the content automatically. Widget helps patients discover how much salt is in their food and the effect on their health.
- Translating the Dietary Approaches to Stop Hypertension (DASH) Diet for Use in Underresourced, Urban African American Communities, 2010

Dietary Approaches to Stop Hypertension (DASH) – A flexible and balanced eating plan endorsed by the National Heart, Lung, and Blood Institute to help lower blood pressure.

- Guide to Lowering Blood Pressure with DASH – Order up to 10 free copies. Booklet contains information on weight loss, physician activity and a week's worth of sample menus and recipes. Electronic Version of DASH Guide
- Blood Pressure Wallet Card – Order up to 10 free copies. The card helps patients monitor their blood pressure readings and reminders about medication and lifestyle changes. Electronic Version of Wallet Card

Eat Well Live Well for Healthy Blood Pressure – A Rochester based community collaborative focused on improving the health of the Rochester region by reducing the impact of high blood pressure in the community.

Management of Adult Hypertension

Measures Commonly Used by National Organizations

Annual Serum Creatinine Test: Percentage of patients aged 18 through 90 years old with a diagnosis of hypertension who had a serum creatinine test done within 12 months. (PQRS)

Blood Pressure Measurement: Percentage of patient visits for patients aged 18 years and older with a diagnosis of hypertension who have been seen for at least 2 office visits, with blood pressure (BP) recorded. (Meaningful Use)

Complete Lipid Profile: Percentage of patients aged 18 through 90 years old with a diagnosis of hypertension who received a complete lipid profile within 60 months. (PQRS)

Controlling High Blood Pressure: 1. Percentage of patients 18-85 years of age who had a diagnosis of hypertension and whose blood pressure was adequately controlled (<140/90mmHg) during the measurement period. (PQRS/Meaningful Use) 2. The percentage of members 18-85 years of age who had a diagnosis of hypertension (HTN) and whose BP was adequately controlled during the measurement year based on the following criteria: Members 18-59 years of age whose BP was <140/90 mm Hg. Members 60-85 years of age with a diagnosis of diabetes whose BP was <140/90 mm Hg. Members 60-85 years of age without a diagnosis of diabetes whose BP was <150/90 mm Hg. (HEDIS 2015)

Diabetes Mellitus Screening Test: Percentage of patients aged 18 through 90 years old with a diagnosis of hypertension who had a diabetes screening test within 36 months. (PQRS)

Dietary and Physical Activity Modifications Appropriately Prescribed: Percentage of patients aged 18 through 90 years old with a diagnosis of hypertension who received dietary and physical activity counseling at least once within 12 months. (PQRS)

Improvement in Blood Pressure: Percentage of patients aged 18-85 years of age with a diagnosis of hypertension whose blood pressure improved during the measurement period. (PQRS/Meaningful Use)

Urine Protein Test: Percentage of patients aged 18 through 90 years old with a diagnosis of hypertension who either have chronic kidney disease diagnosis documented or had a urine protein test done within 36 months. (PQRS)

Use of Aspirin or Other Antithrombotic Therapy: Percentage of patients aged 30 through 90 years old with a diagnosis of hypertension and are eligible for aspirin or other antithrombotic therapy who were prescribed aspirin or other antithrombotic therapy. (PQRS)

Management of Adult Hypertension

References

Centers for Medicare & Medicaid Services (CMS) Meaningful Use Quality Measure. (A set of standards defined by the CMS Incentive Programs that governs the use of electronic health records and allows eligible providers to earn incentive payments by meeting specific criteria.) Available from: <http://www.cms.gov/Regulations-and-Guidance/Legislation/EHRIncentivePrograms/index.html?redirect=/EHRIncentivePrograms/>

Centers for Medicare & Medicaid Services (CMS) Physician Quality Reporting System (PQRS). (A voluntary reporting program that provides incentive payments to eligible professionals who satisfactorily report data on certain quality measures.) Available from: <http://www.cms.gov/Medicare/Quality-Initiatives-Patient-Assessment-Instruments/PQRS/index.html?redirect=/pqrs>

Chobanian AV, Bakris GL, Black HR, Cushman WC, Green LA, Izzo JL Jr, et al. The Seventh Report of the Joint National Committee on Prevention, Detection, Evaluation, and Treatment of High Blood Pressure: the JNC 7 report. JAMA. 2003 Jul 9;290(2):197

Go AS, Bauman M, Coleman King SM, Fonarow GC, Lawrence W, Williams KA, Sanchez E. An effective approach to high blood pressure control: a science advisory from the American Heart Association, the American College of Cardiology, and the Centers for Disease Control and Prevention. Hypertension. 2013;00:1-24. Available from: <http://my.americanheart.org/professional/index.jsp>

Healthcare Effectiveness Data and Information Set (HEDIS) (A tool used by 90% of health plans to evaluate quality of care.). Washington DC. <http://www.ncqa.org/HEDISQualityMeasurement.aspx>

James P, Oparil S, Carter B, Cushman W, Dennison-Himmelfarb C, Handler J, et al. 2014 Evidence-Based Guideline for the Management of High Blood Pressure in Adults Report From the Panel Members Appointed to the Eighth Joint National Committee (JNC 8). JAMA. 2014;311(5):507-520. Available from: <http://jama.jamanetwork.com/article.aspx?articleid=1791497>

Mancia G, Fagard R, Narkiewicz K, Redon J, Zanchetti A, Bořhm M, et al. 2013 ESH/ESC Guidelines for the management of arterial hypertension. The Task Force for the management of arterial hypertension of the European Society of Hypertension (ESH) and of the European Society of Cardiology (ESC). Journal of Hypertension 2013, 31:1281–1357. Available from: <http://www.esh2013.org/wordpress/wp-content/uploads/2013/06/ESC-ESH-Guidelines-2013.pdf>

Monroe County Adult Health Survey, 2012. September 2013. Available from: <http://www2.monroecounty.gov/files/health/DataReports/final%20AHS%20results%20-%202011-11.pdf>

Nwankwo T, Yoon SS, Burt V, Gu Q. Hypertension among adults in the United States: National Health and Nutrition Examination Survey, 2011–2012. NCHS data brief, no 133. Hyattsville, MD: National Center for Health Statistics. 2013. Available from: <http://www.cdc.gov/nchs/data/databriefs/db133.pdf>

Weber MA, Schiffrin EL, White WB, Mann S, Lindholm LH, Kenerson JG, et al. Clinical Practice Guidelines for the Management of Hypertension in the Community A Statement by the American Society of Hypertension and the International Society of Hypertension. The Journal of Clinical Hypertension. 2014 Jan 26;16(1):14-26