



HYPERTENSION PRACTICE GUIDELINES

Risk Intervention	Recommendations
<p>Goals</p>	<p>Minimize risk of increased comorbidities associated with uncontrolled or undetected hypertension.</p> <p>Provide optimal pharmacotherapy for hypertensive patients with little or no side effects.</p> <p>Monitor patient and improve compliance with therapy.</p> <p>Meet patients' and families' expectations and satisfaction with care and education in regards to hypertension.</p>
<p>Medication Reconciliation</p>	<p>Accurately and completely reconcile all medications patient is taking across the continuum.</p> <p><i>(National Patient Safety Goal)</i></p>
<p>Initial Assessment</p>	<p>Medical History</p> <ul style="list-style-type: none"> ▪ Focus on modifiable risk factors such as weight control, sodium and cholesterol intake, physical activity, stress, alcohol use, and smoking. ▪ Assess all medications being used including prescription, over the counter, and illicit drugs. ▪ Document any family history of hypertension, cerebrovascular disease, cardiovascular disease, diabetes mellitus, or dyslipidemia. <p>Physical Exam</p> <ul style="list-style-type: none"> ▪ Measurement of blood pressure with verification in the contra lateral arm. ▪ Height and weight. ▪ Calculation of body mass index (BMI). ▪ Fundoscopic exam for hypertensive retinopathy. ▪ Auscultation for carotid, abdominal, and femoral bruits. ▪ Palpation of the thyroid gland. ▪ Assessment of the heart for abnormal rate and rhythm, additional heart sounds, murmurs, or increased size. ▪ Auscultation of lung sounds for rales or evidence of bronchospasms.

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	<ul style="list-style-type: none"> ▪ Examination of abdomen for abnormal aortic pulsation, masses, enlarged kidneys. <p>(cont.)</p> <ul style="list-style-type: none"> ▪ Extremity evaluations for decreased or absent peripheral pulses, bruits, or edema. ▪ Neurological assessment. <p>Laboratory Studies</p> <ul style="list-style-type: none"> ▪ Potassium ▪ Creatinine (or the corresponding estimated GFR) ▪ Glucose ▪ Hematocrit ▪ Calcium ▪ Urinalysis ▪ Lipid Profile, after a 9- to 12-hour fast ▪ EKG ▪ Optional tests include measurement of urinary albumin excretion or albumin/creatinine ratio 																				
Classification	<p>For adults age 18 years of age and older who are not taking antihypertensives or acutely ill.</p> <table border="1" data-bbox="391 1087 1476 1430"> <thead> <tr> <th data-bbox="391 1087 808 1119">Category</th> <th data-bbox="808 1087 1133 1119">Systolic</th> <th data-bbox="1133 1087 1328 1119"></th> <th data-bbox="1328 1087 1476 1119">Diastolic</th> </tr> </thead> <tbody> <tr> <td data-bbox="391 1150 808 1182">Normal</td> <td data-bbox="808 1150 1133 1182"><120</td> <td data-bbox="1133 1150 1328 1182">and</td> <td data-bbox="1328 1150 1476 1182"><80</td> </tr> <tr> <td data-bbox="391 1213 808 1245">Pre-hypertension</td> <td data-bbox="808 1213 1133 1245">120-139</td> <td data-bbox="1133 1213 1328 1245">or</td> <td data-bbox="1328 1213 1476 1245">80-90</td> </tr> <tr> <td data-bbox="391 1276 808 1350">Hypertension <i>Stage 1</i></td> <td data-bbox="808 1276 1133 1350">140-159</td> <td data-bbox="1133 1276 1328 1350">or</td> <td data-bbox="1328 1276 1476 1350">90-99</td> </tr> <tr> <td data-bbox="391 1381 808 1413"><i>Stage 2</i></td> <td data-bbox="808 1381 1133 1413">>160</td> <td data-bbox="1133 1381 1328 1413">or</td> <td data-bbox="1328 1381 1476 1413">>100</td> </tr> </tbody> </table>	Category	Systolic		Diastolic	Normal	<120	and	<80	Pre-hypertension	120-139	or	80-90	Hypertension <i>Stage 1</i>	140-159	or	90-99	<i>Stage 2</i>	>160	or	>100
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Risk Intervention	Recommendations			
Treatment Recommendations	Blood Pressure Classification Indicators*	Lifestyle Modification	Initial Drug Therapy Without Compelling Indications**	Initial Drug Therapy With Compelling Indications
	Normal <120/80	Encouraged		
	Pre-hypertension 120-139/80-89	Yes	No antihypertensive drug indicated	Drug(s) for compelling indications**
	Stage 1 Hypertension 140-159/90-99	Yes	Thiazide-type diuretics for most. May consider ACEI or ARB, BB, CCB or combination	Drug(s) for the compelling indications.* Other antihypertensive drugs (diuretics, ACEI, ARB, BB, CCB) as needed.
	Stage 2 Hypertension	Yes	Two-drug combination for most*** (usually thiazide-type and ACEI, ARB, BB or CCB)	Drug(s) for the compelling indications.** Other antihypertensive drugs (diuretics, ACEI)
Follow-Up Assessment	Recommend a minimum of 2 visits per year after BP is at goal and stable with increased frequency as indicated by clinical presentation.			
	Medical History <ul style="list-style-type: none"> ▪ Continue to focus on modifiable risk factors. ▪ Reassess all medications being used. ▪ Document any new family history to include hypertension, cerebrovascular disease, cardiovascular disease, diabetes mellitus, or dyslipidemia. Physical Exam			

*Compelling indications (heart failure, post MI, high coronary disease risk, diabetes, chronic kidney disease, recurrent stroke prevention) for antihypertensive drugs are based on benefits from outcome studies or existing clinical guidelines; the compelling indication is managed in parallel with the BP.

**Treat patients with chronic kidney disease or diabetes to BP goal of <130/80 mmHg.

***Initial combined therapy should be used cautiously in those at risk for orthostatic hypotension.

Risk Intervention	Recommendations
	<ul style="list-style-type: none"> ▪ Measurement of blood pressure with verification in the contra lateral arm. ▪ Weight to be included with each exam. (Height to be recorded once a year.) ▪ Auscultation for carotid, abdominal, and femoral bruits. ▪ Palpation of thyroid gland. ▪ Assessment of the heart for abnormal rate and rhythm, additional heart sounds murmurs, or increased size. ▪ Auscultation of lung sounds for rales or evidence of bronchospasms. ▪ Examination of the abdomen for abnormal aortic pulsation, masses, or enlarged kidneys. ▪ Extremity evaluations for decreased or absent peripheral pulses, bruits, or edema. <p>Laboratory Studies</p> <ul style="list-style-type: none"> ▪ Serum potassium and creatinine at least 1-2 times every year. ▪ Additional tests may be ordered at the discretion of the provider based on exam and other clinical findings.
Lifestyle Modification	<p><i>Reviewed and evaluated at least once a year.</i></p> <ul style="list-style-type: none"> ▪ Maintain optimal weight ▪ Limit sodium intake ▪ Adopt the Dietary Approaches to Stop Hypertension (DASH) eating plan which is rich in potassium and calcium ▪ Moderation in the use of alcohol ▪ Regular exercise ▪ Smoking cessation ▪ Stress management
Self Management Education	<ul style="list-style-type: none"> ▪ Assess educational needs and provide self-management education. ▪ Provide access to an interdisciplinary team (RN, CDE, nutritionist, PCP) ▪ Develop individualized educational plans
Psychosocial assessment	<p>Screening completed at every office visit.</p> <p>Should include but is not limited to:</p> <ul style="list-style-type: none"> ▪ Attitudes about the illness ▪ Expectations for medical management ▪ General quality of life

Risk Intervention	Recommendations
	Reassess periodically during assessment contacts to mental health specialist should occur when the patient exhibits any of the following: <ul style="list-style-type: none"> ▪ Gross noncompliance with medical regimen (due to self or others) ▪ Depression ▪ Cognitive functioning that significantly impairs judgment.
Smoking <u>Goal:</u> Complete Cessation	Follow: Ask, Assess, Advise, Assist, and Arrange method. <ul style="list-style-type: none"> ▪ Strongly encourage patient and family to stop smoking. ▪ Provide counseling, nicotine replacement, and formal cessation programs as appropriate.

Source:

The Seventh Report of the Joint National Committee (JNC VII)

<http://www.nhlbi.nih.gov/guidelines/hypertension/phycard.pdf>

JNC VIII due Fall 2011

Guidelines reviewed/updated: 9/24/02 Clinical Quality Committee

7/22/03 Clinical Quality Committee

8/4/05 Clinical Quality & Resource Management Committee

6/7/07 Clinical Quality & Resource Management Committee

6/5/08 Clinical Quality & Resource Management Committee

6/3/2010 Clinical Quality & Resource Management Committee



Reference Card From the Seventh Report of the Joint National Committee on Prevention, Detection, Evaluation, and Treatment of High Blood Pressure (JNC 7)

EVALUATION

CLASSIFICATION OF BLOOD PRESSURE (BP)*			
CATEGORY	SBP MMHg	and	DBP MMHg
Normal	<120	and	<80
Prehypertension	120–139	or	80–89
Hypertension, Stage 1	140–159	or	90–99
Hypertension, Stage 2	≥160	or	≥100

* See Blood Pressure Measurement Techniques (reverse side)
Key: SBP = systolic blood pressure; DBP = diastolic blood pressure

DIAGNOSTIC WORKUP OF HYPERTENSION

- Assess risk factors and comorbidities.
- Reveal identifiable causes of hypertension.
- Assess presence of target organ damage.
- Conduct history and physical examination.
- Obtain laboratory tests: urinalysis, blood glucose, hematocrit and lipid panel, serum potassium, creatinine, and calcium. Optional: urinary albumin/creatinine ratio.
- Obtain electrocardiogram.

ASSESS FOR MAJOR CARDIOVASCULAR DISEASE (CVD) RISK FACTORS

- Hypertension
- Obesity (body mass index ≥ 30 kg/m²)
- Dyslipidemia
- Diabetes mellitus
- Cigarette smoking
- Physical inactivity
- Microalbuminuria, estimated glomerular filtration rate < 60 mL/min
- Age > 55 for men, > 65 for women)
- Family history of premature CVD (men age < 55 , women age < 65)

ASSESS FOR IDENTIFIABLE CAUSES OF HYPERTENSION

- Sleep apnea
- Drug induced/related
- Chronic kidney disease
- Primary aldosteronism
- Renovascular disease
- Cushing's syndrome or steroid therapy
- Pheochromocytoma
- Coarctation of aorta
- Thyroid/parathyroid disease



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National Institutes of Health
National Heart, Lung, and Blood Institute

BLOOD PRESSURE MEASUREMENT TECHNIQUES

METHOD	NOTES
In-office	Two readings, 5 minutes apart, sitting in chair. Confirm elevated reading in contralateral arm.
Ambulatory BP monitoring	Indicated for evaluation of "white coat hypertension." Absence of 10–20 percent BP decrease during sleep may indicate increased CVD risk.
Patient self-check	Provides information on response to therapy. May help improve adherence to therapy and is useful for evaluating "white coat hypertension."

CAUSES OF RESISTANT HYPERTENSION

- Improper BP measurement
- Excess sodium intake
- Inadequate diuretic therapy
- Medication
 - 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 (see reverse side)

COMPELLING INDICATIONS FOR INDIVIDUAL DRUG CLASSES

COMPELLING INDICATION	INITIAL THERAPY OPTIONS
• Heart failure	THIAZ, BB, ACEI, ARB, ALDO ANT
• Post myocardial infarction	BB, ACEI, ALDO ANT
• High CVD risk	THIAZ, BB, ACEI, CCB
• Diabetes	THIAZ, BB, ACEI, ARB, CCB
• Chronic kidney disease	ACEI, ARB
• Recurrent stroke prevention	THIAZ, ACEI

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

- Clinician empathy increases patient trust, motivation, and adherence to therapy.
- Physicians should consider their patients' cultural beliefs and individual attitudes in formulating therapy.

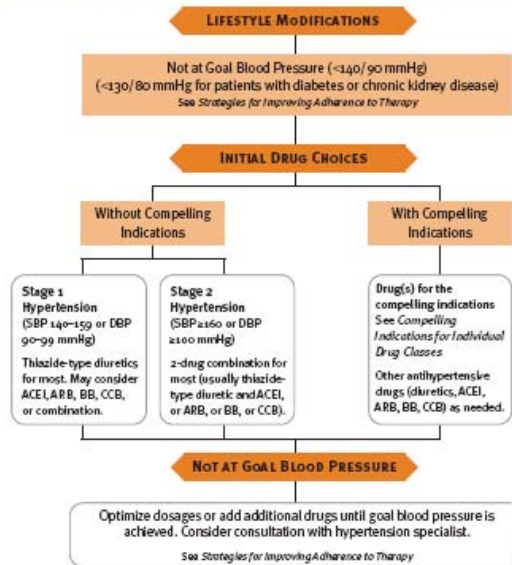
The National High Blood Pressure Education Program is coordinated by the National Heart, Lung, and Blood Institute (NHLBI) at the National Institutes of Health. Copies of the JNC 7 Report are available on the NHLBI Web site at <http://www.nhlbi.nih.gov> or from the NHLBI Health Information Center, P.O. Box 30105, Bethesda, MD 20824-0105; Phone: 301-592-8573 or 240-629-3255 (TTY); Fax: 301-592-8563.

TREATMENT

PRINCIPLES OF HYPERTENSION TREATMENT

- Treat to BP $< 140/90$ mmHg or BP $< 130/80$ mmHg in patients with diabetes or chronic kidney disease.
- Majority of patients will require two medications to reach goal.

ALGORITHM FOR TREATMENT OF HYPERTENSION



PRINCIPLES OF LIFESTYLE MODIFICATION

- 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, and moderation of alcohol consumption.

LIFESTYLE MODIFICATION RECOMMENDATIONS

MODIFICATION	RECOMMENDATION	AVG. SBP REDUCTION RANGE†
Weight reduction	Maintain normal body weight (body mass index 18.5–24.9 kg/m ²).	5–20 mmHg/10 kg
DASH eating plan	Adopt a diet rich in fruits, vegetables, and lowfat 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).	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

* 1 drink = 1/2 oz or 15 mL ethanol (e.g., 12 oz beer, 5 oz wine, 1.5 oz 80-proof whiskey).
† Effects are dose and time dependent.



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