

# Michigan Quality Improvement Consortium Guideline

## *Medical Management of Adults with Hypertension*

The following guideline recommends diagnostic evaluation, education and pharmacologic treatment that support effective patient self-management.

Eligible Population	Key Components	Recommendation and Level of Evidence
Adult patients $\geq 18$ years of age. Not pregnant.  <b>Classification based on mean of 2 or more seated BP readings on each of 2 or more office visits.</b>  Normal BP $<120/<80$  Prehypertension $120-139/80-89$  Hypertension: <b>Stage 1</b> $140-159/90-99$ <b>Stage 2</b> $\geq 160/\geq 100$	Initial assessment	<ul style="list-style-type: none"> <li>The objectives of the initial evaluation are to assess lifestyle, cardiovascular risk factors, concomitant disorders, reveal identifiable causes of hypertension and check for target organ damage and cardiovascular disease.</li> <li>Physical examination: 2 or more BP measurements using regularly calibrated equipment with the appropriate sized cuff and separated by at least 2 minutes, verification in contralateral arm, funduscopic exam, neck exam (bruits), heart and lung exam, abdominal exam for bruits or aortic aneurysm, extremity pulses. <b>[D]</b></li> <li>Laboratory tests prior to initiating therapy: Potassium, creatinine, glucose, hematocrit, calcium, urinalysis, lipid panel, EKG. <b>[D]</b></li> </ul>
	Patient education and nonpharmacologic interventions	<ul style="list-style-type: none"> <li>Lifestyle modification: weight reduction (BMI goal <math>&lt; 25</math>), reduction of dietary sodium to less than 2.4 gm/day, DASH diet <b>[A]</b> (i.e. diet high in fruits and vegetables, reduced saturated and total fat), aerobic physical activity <math>\geq 30</math> minutes most days of the week, tobacco avoidance, increased dietary potassium and calcium, moderation of alcohol consumption <sup>1</sup>. <b>[A]</b></li> <li>Use of self BP monitoring. Check accuracy of home measurement device regularly. Mean self-measured BP <math>&gt; 135/85</math> generally considered to be hypertensive.</li> </ul>
	Goals of Therapy	<ul style="list-style-type: none"> <li>If no other risk factors: target BP <math>&lt;140/90</math>.</li> <li>Patients with risk factors, including diabetes: target BP <math>&lt;140/80</math> (<math>&lt;130/80</math> for patients with kidney disease). <b>[D]</b></li> <li>Caution: low diastolic or orthostatic symptoms may limit ability to control systolic. Use extreme caution if diastolic is below 60. For diabetics, mortality increases if diastolic is below 70.</li> </ul>
	Pharmacologic interventions	<ul style="list-style-type: none"> <li>Hypertension, <b>Stage 1</b> (<math>140-159/90-99</math>): start with thiazide-type diuretics for most patients. ACE-I and long-acting DHP-CCB<sup>2</sup> (e.g. amlodipine) are first-choice additional agents.</li> <li>Hypertension, <b>Stage 2</b> (<math>\geq 160/\geq 100</math>): consider two-drug combination (thiazide plus ACE-I or DHP-CCB<sup>2</sup>).</li> <li>In general, diuretics and DHP-CCB<sup>2</sup> appear to be more effective as an initial treatment in African-Americans.</li> <li>ACE-I recommended in patients with diabetes or heart failure. <b>[A]</b></li> <li>Beta-blockers are recommended in patients with ischemic heart disease or heart failure.</li> <li>Use angiotensin-receptor blockers (ARB) if ACE-I not tolerated.</li> <li>Intensify treatment until treatment goals are met; 3 or more drugs may be necessary for some patients to achieve goal BP.</li> <li>Caution: NSAIDs may complicate management of hypertension and worsen renal function.</li> </ul>
Monitoring and adjustment of therapy <b>[D]</b>	<ul style="list-style-type: none"> <li>Prehypertension without other risk factors: annual BP check with lifestyle modification counseling.</li> <li>Hypertension, <b>Stage 1</b>: initiate therapy and recheck at monthly intervals until goal is reached.</li> <li>Hypertension, <b>Stage 2</b>: initiate therapy and recheck weekly or more often if indicated. Symptomatic Stage 2 may require hospital monitoring and treatment.</li> <li>Modify antihypertensive therapy as needed if adverse effects become intolerable.</li> <li>Once BP controlled with medication: recheck every 3-6 months.</li> <li>Check serum potassium and creatinine at least annually for patients on diuretics/ACE-I/ARB.</li> </ul>	

<sup>1</sup>Moderate alcohol consumption is generally defined as up to two drinks per day for men, one drink per day for women.

<sup>2</sup>DHP-CCB = long-acting dihydropyridine calcium channel blocker (e.g. amlodipine, felodipine)

**Levels of Evidence for the most significant recommendations:** A = randomized controlled trials; B = controlled trials, no randomization; C = observational studies; D = opinion of expert panel

This guideline represents core management steps. It is based on several sources including: The Seventh Report of the Joint National Committee on Prevention, Detection, Evaluation, and Treatment of High Blood Pressure (JNC7) ([nhlbi.nih.gov/guidelines/hypertension/](http://nhlbi.nih.gov/guidelines/hypertension/)); and Hypertension Diagnosis and Treatment, Institute for Clinical Systems Improvement, November 2010 ([icsi.org](http://icsi.org)). Individual patient considerations and advances in medical science may supersede or modify these recommendations.