



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. Classification based on 2 or more seated BP readings on each of 2 or more office visits. Hypertension: Stage 1 140-159/90-99 mm Hg Stage 2 \geq 160/ \geq 100 mm Hg	Initial assessment	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. Physical examination: 2 or more BP measurements ¹ on initial visit plus one or more follow-up visits using regularly calibrated equipment with the appropriate sized cuff and separated by at least 2 minutes with the patient seated and standing, verification in contralateral arm, funduscopic exam, neck exam (bruits), heart and lung exam, abdominal exam for bruits or aortic aneurysm, extremity pulses and neurological assessment [D] .
	Patient education and nonpharmacologic interventions	Lifestyle modification: weight reduction (BMI goal < 25), reduction of dietary sodium to less than 2.4 gm/day, DASH diet [A] (i.e. diet high in fruits and vegetables, reduced saturated and total fat), aerobic physical activity \geq 30 minutes most days of the week, tobacco avoidance, increased dietary potassium and calcium, moderation of alcohol consumption ² [A] . Consider self BP monitoring. Check accuracy of home measurement device regularly. Home readings are often 5 mm Hg lower than office.
	Goals of Therapy	If no other risk factors and < 60 years of age: target BP <140/90 [A] . If no other risk factors and \geq 60 years: target BP <150/90 [B] . Patients with risk factors, including diabetes: target BP <140/90 [B] . Consider target BP <130/80 for CKD patients with albuminuria [D] . 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.
	Pharmacologic interventions	Hypertension, Stage 1 based on systolic and/or diastolic (140-159/90-99): start with thiazide-type diuretic, ACE-I, ARB, or DHP-CCB ³ for almost all patients [A] . Hypertension, Stage 2 (\geq 160/ \geq 100): consider two-drug combination (thiazide plus ACE-I or DHP-CCB). In general, diuretics and DHP-CCB appear to be more effective as an initial treatment in African-Americans. ACE-I recommended in patients with diabetes, CKD, or heart failure. [A] Beta-blockers are recommended in patients with ischemic heart disease or heart failure. Intensify treatment until treatment goals are met; 3 or more drugs may be necessary for some patients to achieve goal BP. Caution: NSAIDs may complicate management of hypertension and worsen renal function. Avoid concurrent use of ACE and ARB.
Monitoring and adjustment of therapy [D]	Hypertension, Stage 1 : initiate therapy and recheck within two months until goal is reached. Hypertension, Stage 2 : initiate therapy and recheck weekly or more often if indicated. Symptomatic Stage 2 may require hospital monitoring and treatment. Recheck at each visit. If elevated, measure BP seated 5-10 minutes, feet flat, arm at rest, appropriate size cuff. Check serum potassium and creatinine at least annually for patients on diuretics/ACE-I/ARB.	

¹American Medical Association. Essential Guide to Hypertension: Accurate Blood Pressure Readings (http://mqic.org/pdf/BP_Readings.pdf)

²Moderate alcohol consumption is generally defined as up to two drinks per day for men, one drink per day for women.

³ACE-I = angiotensin converting enzyme inhibitor, ARB = angiotensin receptor blocker, 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 James, PA, Oparil S, Carter, BL, 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. doi:10.1001/jama.2013.284427; and Kidney Disease: Improving Global Outcomes (KDIGO) CKD Work Group. KDIGO 2012 Clinical Practice Guideline for the Evaluation and Management of Chronic Kidney Disease. Individual patient considerations and advances in medical science may supersede or modify these recommendations.