Michigan Quality Improvement Consortium Guideline

November 2018

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 ≥ 18 years of age. Not pregnant. **Diagnosis and Management:** **2 measures - throw out 1st,** **Rest between,** **Feet flat,** **Hard back,** **Appropriate size cuff** Hypertension: **Stage 1** 130/80-139/89 mm Hg **Stage 2** ≥140/90 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 ≥ 30 minutes most days of the week, tobacco avoidance, increased dietary potassium and calcium, moderation of alcohol consumption[2] **[A].** Encourage out of office BP measures with communication of results, frequent checks for accuracy, and lifestyle and medication adjustments. 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 ≥ 60 years: target BP <150/90 **[B]**. Patients with risk factors, including diabetes, ASCVD, CKD: target BP < 130/80 **[B]**. 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. Goal: <130/80 mm Hg if at risk (ASCVD, CKD, diabetes) and ambulatory. <140/90 mm Hg if no risk factors.
	Pharmacologic interventions	Hypertension, **Stage 1** based on systolic and/or diastolic (130/80-139/89): start with thiazide-type diuretic, ACE-I, ARB, DHP-CCB[3] for almost all patients **[A]**. Hypertension, **Stage 2** (≥140/90): 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 or ARB 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. Multi-drug regimen at moderate dose is preferable to maximum dose monotherapy. Add spironolactone for resistant hypertension. Avoid concurrent use of ACE-I and ARB. Caution: NSAIDs may complicate management of hypertension and worsen renal function.
	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.

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

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

[3]ACE-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 Whelton PK, Carey RM, Aronow WS, Casey DE Jr, Collins KJ, Dennison Himmelfarb C, DePalma SM, Gidding S, Jamerson KA, Jones DW, MacLaughlin EJ, Muntner P, Ovbiagele B, Smith SC Jr, Spencer CC, Stafford RS, Taler SJ, Thomas RJ, Williams KA Sr, Williamson JD, Wright JT Jr. 2017 ACC/AHA/AAPA/ABC/ACPM/AGS/APhA/ASH/ASPC/NMA/PCNA guideline for the prevention, detection, evaluation, and management of high blood pressure in adults: a report of the American College of Cardiology/American Heart Association Task Force on Clinical Practice Guidelines. J Am Coll Cardiol 2018;71:e127–248; 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.