

BRIEF CLINICAL UPDATE

Brief Review of Hypertension Management Based on the 2014 Joint National Committee (JNC8) Guideline

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JNC 7 Compared to JNC 8

The national high blood pressure education program and coordinating committee, a coalition of 39 major professionals, public and voluntary organizations, and 7 federal agencies had reviewed the 2003 JNC 7 guidelines. They addressed multiple issues including BP measurement methods, patients evaluation components, secondary hypertension, adherence to regimen, resistant hypertension, and hypertension in special population based on non-systematic literature review and expert opinion. The recently released 2014 guidelines are based on data from systematic review, restricted to randomized controlled trials. Consequently they addressed a limited number of questions. Experts including those affiliated with professional and public organizations and federal agencies have reviewed the 2014 guidelines.

Definition

The definition of hypertension in JNC 8 is unchanged from JNC 7, which is blood pressure more than 140/90 mmHg.

The JNC7 recommended five classes of drug for initial therapy with the choice of a thiazide type diuretic for most of patients without compelling indication for another classes. They also specified the compelling indication such as diabetes mellitus (DM) or chronic kidney disease (CKD) for the choice of antihypertensive medication. However, the 2014 guideline recommends four classes of medications as the first line agents including calcium channel blockers (CCBs), angiotensin-converting enzyme inhibitor (ACEI), angiotensin-receptor blocker (ARB) or diuretics with specific recommendations for racial, and CKD and DM subgroups based on evidence review.

Three main questions, which JNC 8 focused on:

- 1) In adults with hypertension, does initiating antihypertensive pharmacologic therapy at specific BP thresholds improve health outcomes?
- 2) In adults with hypertension, does treatment with antihypertensive pharmacologic therapy to a specified BP goal lead to improvements in health outcomes?

- 3) In adults with hypertension, do various antihypertensive drugs or drug classes differ in comparative benefits and harms on specific health outcomes?

Strength of Recommendations

The panel recommendations are graded from strong recommendation (Grade A) to no recommendation (Grade N). **Grade A** is used when there is high certainty based on evidence indicating substantial net benefit. **Grade B** is used when there is moderate certainty of moderate-substantial net benefit or high certainty of moderate net benefit. Weak recommendation (**Grade C**) is used when there is at least moderate certainty of small net benefit. They also graded the “recommendation against” as (**Grade D**), which there is at least moderate certainty of having no benefit or risks/harms outweigh benefits. (**Grade E**) indicates the recommendations based on expert opinions when the panel thought it is important to provide clinical guidance despite insufficient or lack of evidence. (**Grade N**) indicates that the panel decided not to make any recommendations for or against given the insufficient or lack of evidence.

Grade A Recommendations

- For patients with age >60 without DM or CKD, goal for BP of < 150/90 mmHg.
- For patients with age 30-59 without DM or CKD, goal for BP of < 140/90 mmHg.

Grade B-E Recommendations

- In patients with age >60 with DM, CKD or both, the goal for BP <140/90.
- In patients with age 18-59 without major comorbidities, the goal for BP <140/90.
- In African descent patients without CKD, the CCBs or thiazide is recommended.
- In African descent patients with CKD, the ACEI or ARB is recommended.
- In all patients age < 75 with CKD, ACEI or ARB is recommended.

- In patients with age >75 with CKD, CCBs or thiazide can be used instead of ACEI or ARB due to potential electrolytes abnormalities such as hyperkalemia.
- Beta blockers are not recommended as initial treatment of hypertension.

Based on the expert opinion (Grade E recommendation), if lower blood pressure is achieved and well-tolerated, treatment does not need to be adjusted. A very recent large observational study in the United States veterans with CKD² showed stricter SBP control is associated with higher all-cause mortality. More than 70,000 individuals were included in the study with median follow up of 6 years. The mortality hazard ratio associated with SBP < 120 vs. 120 to 139 mm Hg was 1.70 after adjustment for propensity scores. Well-designed randomized controlled trials are needed to address the effects of lower blood pressure on health outcomes. JNC 8 has recommended less strict blood pressure control compared to previous guidelines. While await the result of ongoing clinical trials such as the Systolic Blood Pressure Interventional Trial (SPRINT), it appears reasonable to consider that a blood pressure of <120/80 mmHg in hypertensive individuals who are taking antihypertensive drugs may not be safe.

Antihypertensive Medications Alternative

- First-line and later-line treatments can be any of 4 classes of medications: thiazide-type diuretics, CCBs, ACEI or ARB.
- In all patients with CKD regardless of ethnic background either as first-line therapy or in addition to first-line therapy ACEI or ARB is recommended.
- Second- and third-line alternatives included higher doses or combinations of ACE inhibitors, ARBs, thiazide-type diuretics, and CCBs.
- Several medications are now designated as later-line alternatives, including the following: beta-blockers, alphablockers, alpha1/beta-blockers (eg, carvedilol), vasodilating beta-blockers (eg, nebivolol), central alpha2/-adrenergic agonists (eg, clonidine), direct vasodilators (eg, hydralazine), loop diuretics (eg, furosemide), aldosterone antagonists (eg, spironolactone), and peripherally acting adrenergic antagonists (eg, reserpine).
- CCBs and thiazide-type diuretics should be used instead of angiotensin-converting enzyme inhibitor (ACEI), or angiotensin-receptor blocker (ARB) in patients over the age of 75 years with impaired kidney function due to the risk of hyperkalemia, increased creatinine, and further renal impairment.
- Beta-blockers are no longer recommended as for the initial treatment of hypertension.
- ACE inhibitors and ARBs should not be used in the same patient simultaneously (Grade E).

Conclusion

Current recommendations will not substitute for clinical judgment, and treatment must be individualized based on the clinical characteristics of each patient.

For all persons with hypertension, the potential benefits of a healthy diet, weight control, and regular exercise cannot be overemphasized.

It is more important to achieve the blood pressure target than which agent is used to achieve. Consider referral to a hypertension specialist for patients in whom blood pressure goal cannot be achieved with this suggested strategy.

Table 1: 2014 Evidence-Based Guideline on Hypertension Management

Patient population		goal SBP	goal DBP	First line agent
Age>60	w/o CKD or DM	<150	<90	1
Age>60	with CKD or DM or both	<140	<90	2
Age 18-59	w/o major comorbidities	<140	<90	1
African descent	w/o CKD or DM	<140	<90	3
Age<75	with CKD	<140	<90	2
Age>75	With CKD or DM	<150	<90	1

Systolic Blood Pressure(SBP), Diastolic Blood Pressure(DBP), Chronic Kidney Disease (CKD), Diabetes Mellitus (DM), 1- calcium channel blockers (CCBs), angiotensin-converting enzyme inhibitor (ACEI), angiotensin-receptor blocker (ARB), thiazide , 2-ACEI or ARB, 3-CCBs or thiazide

REFERENCES

1. **James PA, Oparil S, Carter BL, Cushman WC, Dennison-Himmelfarb C, Handler J, Lackland DT, LeFevre ML, MacKenzie TD, Oggedegbe O, Smith SC Jr, Svetkey LP, Taler SJ, Townsend RR, Wright JT Jr, Narva AS, Ortiz E.** 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 Feb 5;311(5):507-20. doi: 10.1001/jama.2013.284427. 2014.
2. **Kovesdy CP, Lu JL, Molnar MZ, Ma JZ, Canada RB, Streja E, Kalantar-Zadeh K, Bleyer AJ.** Observational Modeling of Strict vs Conventional Blood Pressure Control in Patients With Chronic Kidney Disease. *JAMA Intern Med*. 2014 Sep 1;174(9):1442-9. doi: 10.1001/jamainternmed.2014.3279.

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