



JNC 8 versus JNC 7 – Understanding the Evidences

Annas Clara Joseph, Karthik MS, Sivasakthi R, Venkatanarayanan R, Sam Johnson Udaya Chander J*

RVS College of Pharmaceutical Sciences, Coimbatore, TN, India.

*Corresponding author's E-mail: mail2samjohnson@gmail.com

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ABSTRACT

Hypertension is growing as a global burden now. It is essential to provide a standard and harmonized guideline for hypertension treatment. There is strong evidence to support treating hypertensive persons aged 60 years or older to a BP goal of less than 150/90 mmHg, however, there is insufficient evidence in hypertensive persons younger than 60 years for a systolic goal, or in those younger than 30 years for a diastolic goal, so the panel of Eighth Joint National Committee (JNC 8) recommends a BP of less than 140/90 mmHg for those groups based on expert opinion. The same thresholds and goals are recommended for hypertensive adults with diabetes or nondiabetic chronic kidney disease (CKD) as for the general hypertensive population younger than 60 years. There is moderate evidence to support initiating drug treatment with an angiotensin-converting enzyme inhibitor, angiotensin receptor blocker, calcium channel blocker, or Thiazide-type diuretic in the nonblack hypertensive population, including those with diabetes. In the black hypertensive population, including those with diabetes, a calcium channel blocker or Thiazide-type diuretic is recommended as initial therapy. There is moderate evidence to support initial or add-on antihypertensive therapy with an angiotensin-converting enzyme inhibitor or angiotensin receptor blocker in persons with CKD to improve kidney outcomes. This educational material debates the recommendations and limitations of JNC 8 Guidelines in the management of hypertension.

Keywords: JNC 8 Guidelines, Chronic Kidney Disease, Diabetes mellitus, diuretic, angiotensin-converting enzyme inhibitor, angiotensin receptor blocker.

INTRODUCTION

In present scenario one of the most common condition seen in primary care is hypertension, which leads to stroke, renal failure, myocardial infarction and death if not detected early and treated appropriately. Patients want to be assured that blood pressure (BP) treatment will reduce their disease burden, while clinicians want guidance on hypertension management using the best scientific evidence.¹ Many guidelines are available for the treatment of hypertension. Each one was developed after continuous study and randomized control trials. Although these guidelines provide evidence-based recommendations for the management of hypertension and meet the clinical needs of most patients, these are not a substitute for clinical judgment, and decisions about care must carefully consider and incorporate the clinical characteristics and circumstances of each individual patient.²

JNC (Joint National Committee)

Joint National Committee is a panel appointed by the National Heart, Lung, and Blood Institute (NHLBI). The first guidelines (JNC-1) was published in 1977, subsequent updates were published in 3 to 6 year intervals, JNC-2 (1980), JNC-3 (1984), JNC-4 (1988), JNC-5 (1992), JNC-6 (1997), and JNC-7 (2004) and the latest edition is JNC-8 published in 2013.³

Development of JNC-8

It was commissioned by the NHLBI in 2008. Panel members were appointed and developed focused critical

questions relevant to practice. Then, they conducted a search of literature. It is limited to randomized controlled trials (RCTs) published between 1966 and 2009. This included a sample of 100 patients or more who were 18 years and above with hypertension. Subsequent search of studies from 2009 to 2013 required samples of 2000 or more patients. The panel members raised three critical questions for adults with hypertension:

- Does initiating antihypertensive pharmacologic therapy at specific blood pressure thresholds improve health outcomes? [When to start therapy?]
- Does treatment with antihypertensive pharmacologic therapy to a specified blood pressure goal lead to improvements in health outcomes? [How low should I go?]
- Do various antihypertensive drugs or drug classes differ in comparative benefits and harms on specific health outcomes? [What drug do I use?]

In 2013, the NHLBI decided that it will no longer publish clinical guidelines, proposed to work collaboratively with other organizations. The appointed panel members for JNC-8 decided to publish their findings independently and published online in JAMA in December 2013, received no endorsements from other organizations. A multitude of other hypertension guidelines were also published in 2013 viz.; AHA/ACC/CDC advisory algorithm, American Society of Hypertension/International Society of Hypertension (ASH/ISH), European Society of Hypertension and European Society of Cardiology



(ESH/ESC), and Canadian Hypertension Education Program (CHEP).⁴

JNC-8 Recommendations

The following recommendations were based on the systematic evidence review. Recommendations 1 through 5 address questions 1 and 2 concerning thresholds and goals for BP treatment. Recommendations 6, 7, and 8 address question 3 concerning selection of antihypertensive drugs.

Recommendation 9 is a summary of strategies based on expert opinion for starting and adding antihypertensive drugs.

The evidence statements supporting the recommendations are in the online supplement.

Recommendation 1

In the general population aged 60 years and above, initiate pharmacologic treatment to lower blood pressure (BP) at systolic blood pressure (SBP) ≥ 150 mmHg or diastolic blood pressure (DBP) ≥ 90 mmHg and treat to a goal SBP < 150 mmHg and goal DBP < 90 mmHg. (Strong Recommendation – Grade A)

Corollary Recommendation

In the general population aged 60 years and above, if pharmacologic treatment for high BP results in lower achieved SBP (for example, < 140 mmHg) and treatment is well tolerated and without adverse effects on health or quality of life, treatment does not need to be adjusted.

Recommendation 2

In the general population less than 60 years, initiate pharmacologic treatment to lower BP at DBP ≥ 90 mmHg and treat to a goal DBP < 90 mmHg.

(For ages 30-59 years, Strong Recommendation – Grade A; For ages 18-29 years, Expert Opinion – Grade E)

Recommendation 3

In the general population less than 60 years, initiate pharmacologic treatment to lower BP at SBP ≥ 140 mmHg and treat to a goal SBP < 140 mmHg. (Expert Opinion – Grade E)

Recommendation 4

In the population aged 18 years and above with chronic kidney disease (CKD), initiate pharmacologic treatment to lower BP at SBP ≥ 140 mmHg or DBP ≥ 90 mmHg and treat to goal SBP < 140 mmHg and goal DBP < 90 mmHg. (Expert Opinion – Grade E)

Recommendation 5

In the population aged 18 years and above with diabetes, initiate pharmacologic treatment to lower BP at SBP ≥ 140 mmHg or DBP ≥ 90 mmHg and treat to a goal SBP < 140 mmHg and goal DBP < 90 mmHg. (Expert Opinion – Grade E)

Recommendation 6

In the general nonblack population, including those with diabetes, initial antihypertensive treatment should include a Thiazide-type diuretic, calcium channel blocker (CCB), angiotensin-converting enzyme inhibitor (ACEI), or angiotensin receptor blocker (ARB). Moderate Recommendation – Grade B)

Recommendation 7

In the general black population, including those with diabetes, initial antihypertensive treatment should include a Thiazide-type diuretic or CCB. (For general black population: Moderate Recommendation – Grade B; for black patients with diabetes: Weak Recommendation – Grade C)

Recommendation 8

In the population aged 18 years and above with CKD, initial (or add-on) antihypertensive treatment should include an ACEI or ARB to improve kidney outcomes. This applies to all CKD patients with hypertension regardless of race or diabetes status. (Moderate Recommendation – Grade B)

Recommendation 9

The main objective of hypertension treatment is to attain and maintain goal BP. If goal BP is not reached within a month of treatment, increase the dose of the initial drug or add a second drug from one of the classes in recommendation 6 (Thiazide-type diuretic, CCB, ACEI, or ARB).

The clinician should continue to assess BP and adjust the treatment regimen until goal BP is reached. If goal BP cannot be reached with two drugs, add and titrate a third drug from the list provided. Do not use an ACEI and an ARB together in the same patient.

If goal BP cannot be reached using only the drugs in recommendation 6 because of a contraindication or the need to use more than three drugs to reach goal BP, antihypertensive drugs from other classes can be used.

Referral to a hypertension specialist may be indicated for patients in whom goal BP cannot be attained using the above strategy or for the management of complicated patients for whom additional clinical consultation is needed. (Expert Opinion – Grade E).^{5,6}

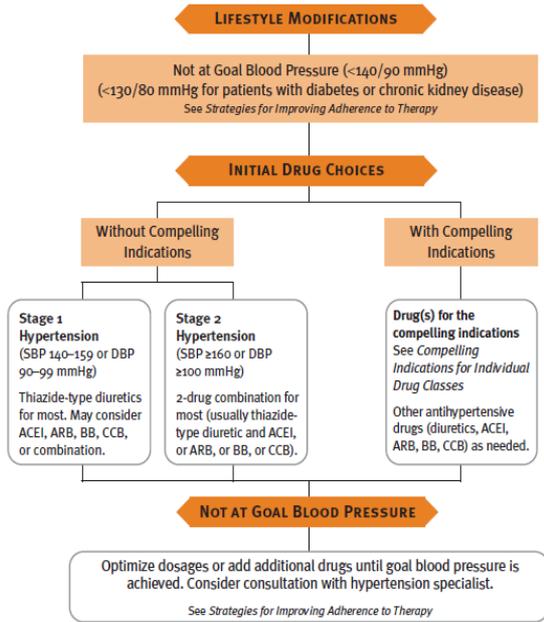
Comparison Between JNC-7 and JNC-8

JNC-7 Blood Pressure Classification⁷

Blood Pressure Classification	Systolic blood pressure (mmHg)	Diastolic blood pressure (mmHg)
Normal	< 120 and	< 80
Pre-hypertension	120-139 or	80-89
Stage 1 hypertension	140-159 or	90-99
Stage 2 hypertension	≥ 160 or	≥ 100



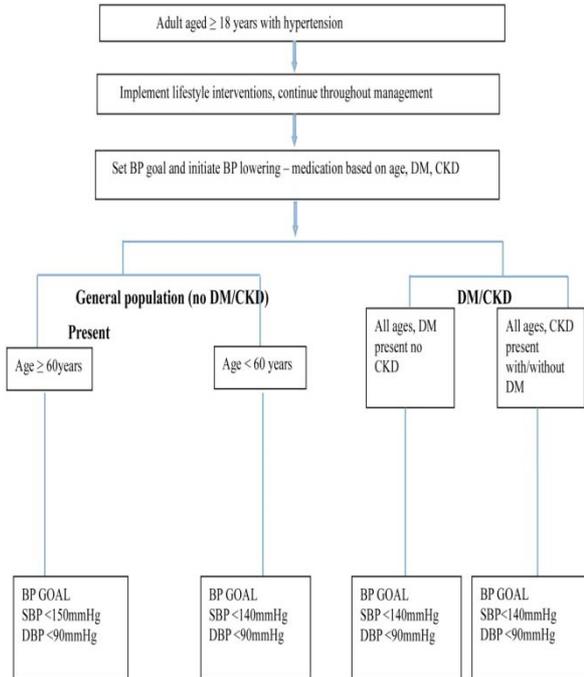
JNC-7 Treatment Algorithm⁷



Hypertension Classification According to JNC 8

CLASSIFICATION:-

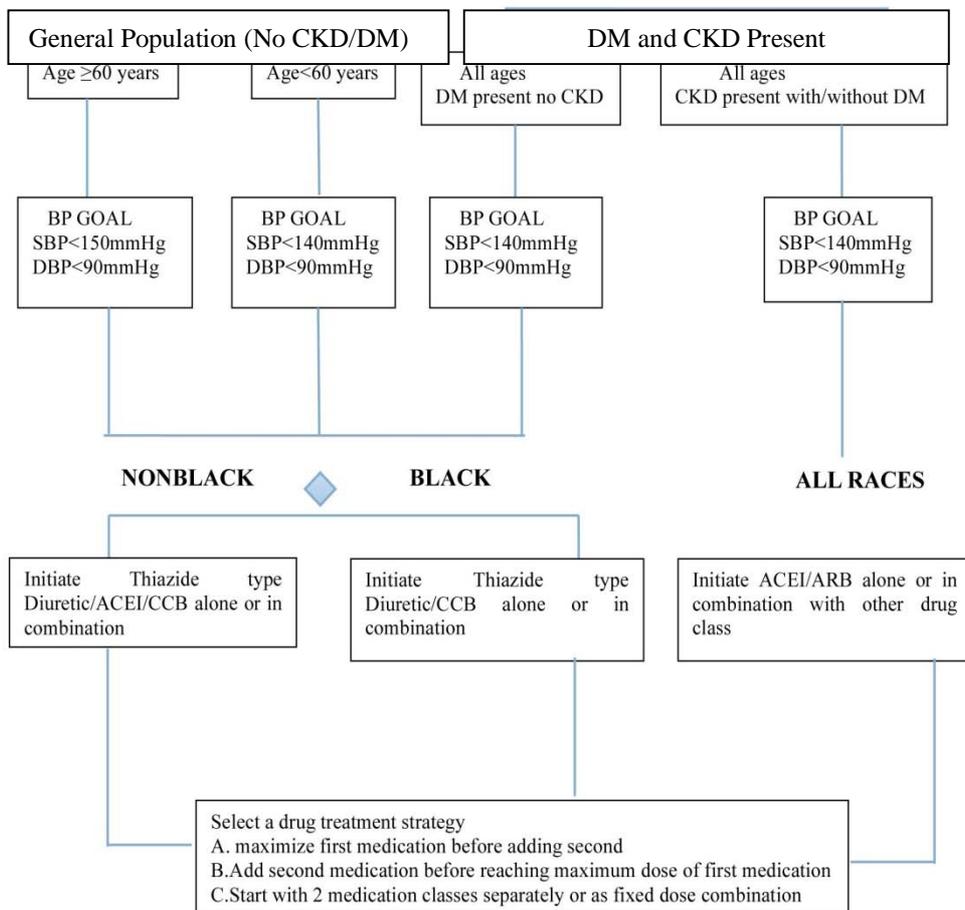
JNC-8 Classification of Blood Pressure



Source: Chobanian AV, Bakris GL, Black HR. Seventh Report of the Joint National Committee on Prevention, Detection, Evaluation, and Treatment of High Blood Pressure. Hypertension, 42, 2003, 1206-52.

TREATMENT GOAL:-

Treatment algorithm for hypertension



Summary of JNC 7 and JNC 8 Recommendations



Topic	JNC 7	JNC 8
Methodology	<ul style="list-style-type: none"> ➤ Nonsystematic literature review by expert committee including a range of study designs. ➤ Recommendations based on consensus. 	<ul style="list-style-type: none"> ➤ Critical questions and review criteria defined by expert panel with input from methodology team. Initial systematic review by methodologists restricted to RCT evidence. ➤ Subsequent review of RCT evidence and recommendations by the panel according to a standardized protocol.
Definitions	<ul style="list-style-type: none"> ➤ Defined hypertension and pre-hypertension. 	<ul style="list-style-type: none"> ➤ Definitions of hypertension and pre-hypertension not addressed, but thresholds for pharmacologic treatment were defined.
Treatment Goals	<ul style="list-style-type: none"> ➤ Separate treatment goals defined for “uncomplicated” hypertension and for subsets with various comorbid conditions (diabetes and CKD). 	<ul style="list-style-type: none"> ➤ Similar treatment goals defined for all hypertensive populations except when evidence review supports different goals for a particular subpopulation.
Lifestyle recommendations	<ul style="list-style-type: none"> ➤ Recommended lifestyle modifications based on literature review and expert opinion. 	<ul style="list-style-type: none"> ➤ Lifestyle modifications recommended by endorsing the evidence based recommendations of the Lifestyle Work Group.
Drug therapy	<ul style="list-style-type: none"> ➤ Recommended five classes to be considered as initial therapy, but recommended thiazide-type diuretics as initial therapy for most patients without compelling indication for another class. ➤ Specified particular antihypertensive medication classes for patients with compelling indications, ie, diabetes, CKD, heart failure, myocardial infarction, stroke, and high CVD risk. ➤ Included a comprehensive table of oral antihypertensive drugs including names and usual dose range. 	<ul style="list-style-type: none"> ➤ Recommended selection among four specific medication classes (ACEI or ARB, CCB or diuretics) and doses based on RCT evidence. ➤ Recommended specific medication classes based on evidence review for racial, CKD, and diabetic subgroups. ➤ Panel created a table of drugs and doses used in the outcome trials.
Scope of topics	<ul style="list-style-type: none"> ➤ Addressed multiple issues (blood pressure measurement methods, patient evaluation components, secondary hypertension, adherence to regimens, resistant hypertension, and hypertension in special populations) based on literature review and expert opinion. 	<ul style="list-style-type: none"> ➤ Evidence review of RCTs addressed a limited number of questions, those judged by the panel to be of highest priority.
Review process prior to publication	<ul style="list-style-type: none"> ➤ Reviewed by the National High Blood Pressure Education Program Coordinating Committee, a coalition of 39 major professional, public, and voluntary organizations and 7 federal agencies. 	<ul style="list-style-type: none"> ➤ Reviewed by experts including those affiliated with professional and public organizations and federal agencies. ➤ No official sponsorship by any organization should be inferred.

Source: James PA, Oparil S, Carter BL. 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*. 311(5), 2014, 507-20.

Comparison with other Guidelines⁸

BP Goal	JNC-7	JNC-8	ASH/ISH	ESC/ESH
Age				
Age < 60	<140/90	<140/90	<140/90	<140/90
Age 60-79	<140/90	<150/90	<140/90	<140/90
Age 80+	<140/90	<150/90	<150/90	<150/90
Co-morbidities				
Diabetes	<130/80	<140/90	<140/90	<140/85
CKD	<130/80	<140/90	<140/90	<130/90
Therapy				
Non-black (no DM or CKD)	Thiazide	Thiazide, ACEI, ARB, CCB	<60: ACEI, ARB >60: CCB, Thiazide	Thiazide, ACEI, ARB, CCB, BB
Black (no DM or CKD)	Thiazide	Thiazide, CCB	Thiazide, CCB	Thiazide, ACEI, ARB, CCB, BB
Diabetes	ACEI, ARB, CCB, BB, Thiazide	CCB, Thiazide	ACEI, ARB, CCB, Thiazide	ACEI, ARB
CKD	ACEI, ARB	ACEI, ARB	ACEI, ARB	ACEI, ARB



Limitations of JNC 8 Guideline

JNC 8 guideline is not a comprehensive guideline and is limited in scope because of the focused evidence review to address the three specific questions. The decision on choice of drug was made to focus on three questions considered to be relevant to most physicians and patients. Treatment adherence and medication costs were thought to be beyond the scope of this review, but the reviewers acknowledge the importance of both issues. In addition, the ability to compare studies from different time periods was limited by differences in clinical trial design and analytic techniques. Moreover, this guideline was not endorsed by any federal agency or professional society prior to publication and thus is a departure from previous JNC reports.⁹

DISCUSSION

The recommendations based on RCT evidence in this guideline differ from recommendations in other currently used guidelines supported by expert consensus. For example, JNC 7 and other guidelines recommended treatment to lower BP goals in patients with diabetes and CKD based on observational studies.⁴ There are nine recommendations given in JNC 8, if older than 60 years, the new guideline is to treat for a blood pressure of less than 150/90 mm Hg. If younger than 60 years, the goal is less than 140/90 mm Hg. For patients who have kidney disease and diabetes, the goal is 140/90 mm Hg. Thiazide diuretics, CCB, ARBS, and ACEIs are the four drug class suggested as first line therapy. Alpha- and beta-blockers were not recommended for initial therapy, alpha-blockers: worse cerebrovascular, heart failure, and combined cardiovascular outcomes vs initial treatment with a diuretic and beta-blockers lead to higher rate of primary composite outcome of cardiovascular death, MI, or stroke compared with use of an ARB.¹⁰ It takes a lot of time for physicians to instruct patients and to get them on board with the new goals and to have the patients actually know their numbers, to be invested in the numbers. With these new guidelines, patient education has obviously changed, and this confusion can create a lot of issues. Guideline writers should come to a consensus. The guideline was published in *JAMA*, and the opposing views were in the *Annals of Internal Medicine*. This makes it difficult for the practicing physician to try and sort out the pertaining issues.¹¹ The observations from a study conducted by current researchers MSK and ACJ on assessment of prescribing pattern in hypertensive patients and comparison with JNC 8 guidelines shows that most of the prescriptions (56%) were not following the JNC 8 guideline. This recommends the policy makers of the country to make the practicing physicians aware of the JNC 8 guideline, and if possible, adopt the same.

CONCLUSION

It is important to note that this evidence-based guideline has not redefined high BP, and the panel believes that the 140/90 mmHg definition from JNC 7 remains reasonable.

The relationship between naturally occurring BP and risk is linear down to very low BP, but the benefit of treating to these lower levels with antihypertensive drugs is not established. For all persons with hypertension, the potential benefits of a healthy diet, weight control, and regular exercise cannot be over emphasized. These lifestyle treatments have the potential to improve BP control and even reduce medication needs. The recommendations from this evidence-based guideline from panel members appointed to the Eighth Joint National Committee (JNC 8) offer clinicians an analysis of what is known and not known about BP treatment thresholds, goals, and drug treatment strategies to achieve those goals based on evidence from RCTs. However, these recommendations are not a substitute for clinical judgment, and decisions about care must carefully consider and incorporate the clinical characteristics and circumstances of each individual patient. We hope that the algorithm will facilitate implementation and be useful to busy clinicians. The strong evidence base of this report should inform quality measures for the treatment of patients with hypertension; however, JNC 8 guideline are evidence based, more simplified, with clear-cut target range and it can surely serve a handy reference in the hands of clinicians and clinical pharmacists in managing hypertensive patients.

Conflict of Interest: None.

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