

# The Eight Joint National Committee on Detection, Evaluation and Treatment of Hypertension (JNC 8); How it Differs from JNC 7 and the Clinical Implications

*Okwuonu CG<sup>1\*</sup>, Adejumo OA<sup>2</sup> and Okaka EI<sup>3</sup>*

<sup>1</sup>Nephrology Unit, Department of Internal Medicine, Federal Medical Centre, Umuahia, Abia State, Nigeria

<sup>2</sup>Kidney Care Centre, University of Medical Sciences, Ondo, Ondo State

<sup>3</sup>Nephrology Unit, Department of Internal Medicine, University of Benin Teaching Hospital Benin City Nigeria

## ABSTRACT

The global burden of disease has shifted from communicable to non-communicable disease. Hence, hypertension has achieved global significance. Hypertension related morbidity and mortality is quite high all over the world. Physicians require guidelines in management of hypertension that is based on best available scientific evidence so as to have improved patient's outcome and standardize their clinical practice. The aim of this review was to compare the most recent hypertension guideline released by the Eight Joint National Committee on Detection, Evaluation and Treatment of Hypertension (JNC 8) and the former (JNC 7), highlighting their differences and their clinical implications in patient's management.

## INTRODUCTION

The commonest non-communicable disease and major cause of cardiovascular disease worldwide is hypertension.<sup>1-2</sup> The burden associated with hypertension is high, accounting for death in more than 5.8 % of the population worldwide as well as loss of 11.9 % years of life and adjusted life of 1.4 %.<sup>3</sup> It affects approximately 11% - 42% of Africans<sup>4</sup>

<sup>6</sup> and is the commonest non-communicable diseases in Nigeria<sup>7</sup> with prevalence ranging from 8% - 46.4%.<sup>8-13</sup>

While patients with hypertension are always concerned if blood pressure (BP) treatment would reduce their disease burden, physicians need guidelines for management of hypertension that is supported by the best available scientific evidence.

In February 2014, a new guideline for management of hypertension was released by the Eight Joint National Committee on Detection, Evaluation and Treatment of Hypertension.<sup>14</sup> This evidence-based hypertension guideline gave nine recommendations which addressed thresholds and goals for pharmacologic treatment of hypertension as well as which particular antihypertensive medication would lead to better health outcomes compared with other anti-hypertensives.

Recommendations 1 to 5 addressed questions about thresholds and target for BP treatment. Recommendations 6 to 8 focused on selection of anti-hypertensive medication. Recommendation 9 summarized strategies (based on expert opinion) for commencing and for add-on antihypertensive drugs. The question that readily

comes to the mind of clinicians is how the new guidelines and recommendations differ with the former and how these differences would influence clinical practice? This review is aimed at providing a quick summary of notable differences and possible clinical implications.

### **METHODOLOGY**

The methodology used by the JNC 8 to reach these recommendations differed from that of the Seventh Joint National Committee (JNC 7). Recommendations in JNC 7 were based on non-systematic literature reviews that included a number of study designs. These recommendations were also based on consensus opinion. On the other hand the recommendations in JNC 8 were based on evidence from systematic review of randomized clinical trials using standardized protocol. The panel in JNC 8 restricted its evidence review to randomized clinical trials (RCTs) because such study designs are less subject to bias than other study designs and represent the gold standard for determining efficacy and effectiveness.<sup>15</sup> The implication of this is that JNC 8, at a glance, may be seen to reflect evidence-based medicine. This, perhaps should translate to the propensity of being widely embraced by the medical community. But this has not proven to be so, at least in the recent past. There have been several media debates among physicians on what the BP target should be. Hence, JNC-8 has not been endorsed by other stakeholders such as American Heart Association, American College of Cardiology and National Heart, Lung and Blood Institute. Physicians may, therefore, individualize blood pressure targets for their patients as the safest option.

### **Pre-hypertension**

The definitions of pre-hypertension and hypertension, which were clearly addressed in JNC 7 was not reflected in JNC 8. The term pre-hypertension was firstly introduced as a blood pressure (BP) category by the JNC 7 in 2003, replacing previous categories of “high-normal” and “above-optimal” BP.<sup>16</sup> This report, published in 2003, originally proposed the following classification based upon the average of two or more properly measured blood pressure readings at each of two or more visits after an initial screen;<sup>16</sup> Normal blood pressure - systolic BP <120 mmHg and diastolic BP <80 mmHg Prehypertension

- systolic BP 120 to 139 mmHg or diastolic BP 80 to 89 mmHg. The implication of its non-inclusion in this new guideline (JNC 8) is that the importance of its recognition may be lost with time. According to JNC-7, prehypertension is not a disease entity but helps the physician to know when to intervene in the patients’ lifestyle so as to prevent its progression to hypertension.<sup>16</sup> The JNC 8 rather, addressed thresholds for commencing pharmacologic treatment of hypertension. This is appropriate since physicians need to answer an important question of “when to intervene?”

### **Therapeutic goals**

The JNC7 recommended different treatment goals for patients with “uncomplicated” hypertension and those with other comorbid conditions like diabetes and chronic kidney disease while a treatment goal of < 140/90 mmHg was recommended for all hypertensive populations by the JNC 8. The exception was the sub-group of hypertensive patients aged 60 years and above for whom a treatment goal of < 150/90mmHg was recommended. A follow up to this recommendation was that for patients doing well on a treatment goal of < 140/90 mmHg without adverse effects or reduced quality of life, their treatment should not be adjusted to fit this new recommendation. Although reviewed evidence strongly supports a <150/90mmHg goal for the elderly, some JNC 8 panel members recommended that the JNC 7 goal of <140/90mmHg be maintained in black elderly hypertensives and patients who have other cardiovascular risk factors in order reduce the possibility of adverse cardiovascular outcomes in this group of hypertensives.

This agrees with preliminary results of a landmark clinical trial sponsored by the National Institutes of Health called the Systolic Blood Pressure Intervention Trial (SPRINT),<sup>17</sup> which showed that adjusting the amount or type of blood pressure medication to achieve a target systolic blood pressure of 120 mmHg reduced rates of cardiovascular events, such as heart attack, heart failure, and stroke, by about 30%, and the risk of death by about 25%, compared to the target systolic pressure of 140 mm Hg. This study, when concluded, may suggest alternative recommendations to that by JNC-8.

### **Lifestyle modification**

The JNC 7 recommended lifestyle modifications based on expert opinion and literature review while in JNC 8 it was based on the evidence-based recommendations of the Lifestyle Work Group. These modifications, which in the past were referred to as non-pharmacologic therapy, serve as complimentary therapy for hypertension. It includes weight reduction, increased physical activity, moderation of dietary sodium and alcohol intake and following the Dietary Approach to Stop Hypertension (DASH) eating plan.<sup>16,18</sup> These modifications play a major complimentary role in reduction of BP and other cardiovascular risk factors. Although mentioned in JNC 8, its role was not emphasized as in JNC 7. The implication of this to clinical practice is that patients may therefore lose the benefits that lifestyle modification confers on cardiovascular risk reduction if physicians de-emphasize on it with time.

### **Pharmacotherapy**

In terms of pharmacotherapy, the JNC 7 recommended five classes of drugs to be used as initial therapy for hypertensive patients and thiazide-type diuretics as initial therapy for most patients without compelling indication for other classes. It also specified the antihypertensive medication classes to be considered for patients with compelling indications like diabetes, chronic kidney disease, heart failure, myocardial infarction, stroke, and high cardiovascular disease risk. On the other hand, JNC 8 excluded beta blockers and recommended four classes of BP medication for initiation of pharmacotherapy (angiotensin converting inhibitors or angiotensin receptor blockers, calcium channel blockers or diuretics) and doses based on RCT evidence. It also recommended specific medication classes based on reviewed evidence, for racial, CKD, and diabetic sub-groups. In resource poor clinical settings as is often the case in Africa, BP medication classes like the alpha-2 agonists and centrally acting anti-hypertensives tend to be prescribed as initial therapy because they are relatively cheap. Time will tell if these guidelines would influence the prescription habits of health care providers in such clinical settings.

### **Comprehensiveness**

Finally, JNC 7 discussed multiple issues ranging from measurement of blood pressure methods, patient evaluation components, secondary

hypertension, adherence to regimens, resistant hypertension, hypertension in special populations and adherence to drug regimen. On the other hand, JNC 8 addressed only a limited number of questions, those evaluated by the panel to be of utmost priority

### **REFERENCES**

1. Kearney PM, Whelton M, Reynolds K, Whelton PK, He J. Worldwide prevalence of hypertension: a systematic review. *J Hypertens*. 2004;22:11-19.
2. Kearney PM, Whelton M, Reynolds K, Muntner P, Whelton PK, He J. Global burden of hypertension: analysis of worldwide data. *Lancet*. 2005;365:217-223.
3. Kannel WB. Blood pressure as a cardiovascular risk factor: prevention and treatment. *JAMA*. 1996;275:1571-1576.
4. Adedoyin RA, Mbada CE, Balogun MO, Martins T, Adebayo RA, Akintomide A, et al. Prevalence and pattern of hypertension in a semiurban community in Nigeria. *Eur J Cardiovasc Prev Rehabil*. 2008;15:683-687.
5. Twagirumukiza M, De Bacquer D, Kips JG, de Backer G, Stichele RV, Van Bortel LM. Current and projected prevalence of arterial hypertension in sub-Saharan Africa by sex, age and habitat: an estimate from population studies. *J Hypertens*. 2011;29:1243-1252.
6. Tesfaye F, Byass P, Wall S. Population based prevalence of high blood pressure among adults in Addis Ababa: uncovering a silent epidemic. *BMC Cardiovasc Disord*. 2009;9:39.
7. Akinkugbe OO. Non communicable disease in Nigeria. Final Report of National Survey. Federal Ministry of Health Lagos: 1997:1-118.
8. Ogunlesi A, Osotimehin B, Abbiyessuku F, et al. Blood pressure and educational level among factory workers in Ibadan, Nigeria. *J Hum Hypertens*. 1991;5:375-380.
9. Arogundade F, Sanusi A, Hassan M, Gbadegesin A, Olarinoye F, Otuyemi B. Undiagnosed hypertension and proteinuria in

- a market population in Ile Ife, Nigeria. *AJNT*. 2011;4:141-146.
10. Oladapo OO, Salako L, Sadiq O, Shoyinka K, Adedapo K, Falase AO. A Prevalence of cardiometabolic risk factors among a rural Yoruba South-Western Nigerian population; a population-based survey. *Cardiovasc J Afr*. 2010;21:26-31.
  11. Ulasi II, Ijoma CK, Onodugo OD. Community based study of hypertension and cardiometabolic syndrome in semi-urban and rural communities in Nigeria. *BMC Health Serv Res*. DOI:10.1186/1472-6963-10-71
  12. Ogah OS, Madukwe OO, Onyeonoro UU, Chukwuonye II, Ukaegbu AU, Akhimien MO, et al. Cardiovascular risk factors and non-communicable diseases in Abia state, Nigeria: report of a community-based survey. *Int J Med Biomed Res*. 2013;2:57-68.
  13. Onwubere BJ, Ejim EC, Okafor CI, Emehel A, Mbah AU, Onyia U, et al. Pattern of Blood Pressure Indices among the Residents of a Rural Community in South East Nigeria. *Int J Hypertens*. 2011;2011:621074.
  14. James PA, Oparil S, Carter BL, Cushman WC, Dennison-Himmelfarb C, Handler J, 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;311:507-520.
  15. Finding WhatWorks in Health Care: Standards for Systematic Reviews. 2011. Available at <http://www.iom.edu/Reports/2011/Finding-What-Works-in-Health-Care-Standards-for-systematic-Reviews.aspx> (accesses 22<sup>nd</sup> June 2015)
  16. Chobanian AV, Bakris GL, Black HR, et al. The Seventh Report of the Joint National Committee on Prevention, Detection, Evaluation, and Treatment of High Blood Pressure: the JNC 7 report. *JAMA*. May 21 2003;289:2560-2572.
  17. National Institute of Health. Landmark NIH study shows intensive blood pressure management may save lives. Available at <http://www.nhlbi.nih.gov/news/press-releases/2015/landmark-nih-study-shows-intensive-blood-pressure-management-may-save-lives> (accessed 24<sup>th</sup> October 2015).
  18. Okwuonu CG, Emmanuel CI, Ojimadu NE. Perception and practice of lifestyle modification in the treatment of hypertension among hypertensives in South-East Nigeria. *Int J Med Biomed Res* 2014;3:121-131.