

New Hypertension Guidelines: Do Blood Pressure Goals Need to Change with Age?

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The later part of 2013, saw a new wave of hypertension (HTN) guidelines. The long awaited Eighth Report of the Joint National Committee (JNC8) was released along with several other guidelines.^{1,2,3} These guidelines are not uniform in their recommendations and have varied blood pressure (BP) goals and pharmacological treatment recommendations. The focus of this newsletter is to highlight the key recommendations and controversies with JNC8 guidelines in the context of the scientific literature to date.

JNC8 Guidelines

There are nine general recommendations made in JNC 8 which are based on quantitative systematic reviews of randomized clinical trials (RCTs) summarized in **Table 1**. The quality of evidence and strength of recommendations were rated based on NHLBI grading format. The NHLBI appoints expert panels to conduct systematic evidence reviews to enable clinical practice guideline development. The NHLBI grading methodologies range from A – Strong evidence to support the recommendation to E – Expert Opinions support the recommendation and the evidence is not clear.

Table 1. JNC8 Recommendations for Management of Hypertension¹

Recommendations	Grade
1. Population age ≥ 60 years, initiate therapy at BP ≥ 150/90 mm Hg to lower BP to <150/90 mmHg	A-Strong
2. Population age <60 years, initiate therapy at DBP ≥ 90 mm Hg to lower DBP to < 90 mmHg	A-Strong (age 30-59) E-Expert Opinion (age 18-29)
3. Population age < 60 years, initiate therapy at SBP > 140 mmHg to lower SBP to <140 mmHg	E-Expert Opinion
4. Population age ≥ 18 years with CKD or Diabetes, initiate therapy at BP ≥140/90 mmHg to lower BP to < 140/90 mmHg	E-Expert Opinion
5. Population age ≥ 18 years with diabetes, initiate therapy at BP ≥140/90 mmHg to lower BP to < 140/90 mmHg	E-Expert Opinion
6. In nonblack population, initial antihypertensive treatment should include a thiazide, CCB, ACEI/ARB	B-Moderate
7. In black population, initial antihypertensive treatment should include a thiazide or CCB	B-Moderate (without diabetes) C-Weak (with diabetes)
8. Population age ≥ 18 years with CKD, regardless of race, initial antihypertensive treatment should include an ACEI/ARB	B-Moderate
9. If goal BP is not reached within 1 month, increase the dose or add second agent. If goal BP not reach with 2 drugs, add and titrate a third drug. Do not use an ACEI and an ARB together. If goal BP cannot be reached with recommended medications, antihypertensive drugs from other classes can be used. Referral to a hypertensive specialist may be indicated.	E-Expert Opinion
Abbreviations: ACEI- angiotensin converting enzyme inhibitor, ARB- angiotensin receptor blocker, BP- blood pressure, CCB- calcium channel blocker, CKD- chronic kidney disease, DBP- diastolic blood pressure, SBP-systolic blood pressure	

Treatment

The JNC8 recommendations for initial pharmacologic treatment are summarized in **Table 2**. Like the JNC7 panel, the JNC8 panel recommended thiazide-type diuretics as initial therapy for most patients. Although angiotensin converting enzyme inhibitors (ACEIs), angiotensin receptor blockers (ARBs), and calcium channel blockers (CCBs) are acceptable alternatives, thiazide-type diuretics still have the best evidence for outcomes such as decreased stroke and all-cause mortality. The JNC 8 panel does not recommended first-

line therapy with beta-blockers (BB) and alpha-blockers due to higher rate of CV events when compared to ARBs and diuretics, respectively.

According to JNC8 guidelines, if the goal BP is not reached within 1 month of treatment initiation there are two recommended strategies: 1) the dose of the drug can be increased, 2) a second or third agent from the recommended drug classes can be initiated. The patient may be referred to a hypertension specialist if goal BP cannot be attained using the above strategies or for the management of complicated patients. The panel recommends that those who have achieved tighter BP control than the stated goal and are tolerating their treatment without adverse effects on health or quality of life can continue current treatment without adjustment.

The guidelines do not recommend the concomitant use of ACEI and ARB. This combination has not been shown to improve mortality and morbidity rates from cardiovascular (CV) causes and is associated with increased risk of side effects such as hypotension and renal impairment.¹

Similar to JNC7, lifestyle modifications are strongly emphasized in JNC8 and include the Dietary Approaches to Stop Hypertension (DASH) eating plan, weight loss, sodium intake of less than 2.4 grams per day, and at least 30 minutes of aerobic activity most days of the week.

Table 2: Comparison of Goal BP and Initial Drug Therapy for Adults with Hypertension^{1-3, 8}

Guideline	Population	Initiation Trigger (mm Hg)	Goal BP (mm Hg)	Initial Drug Treatment Options
JNC 8 (2013)	≥ 60 y	≥150/90	<150/90	Non-Black: thiazide, ACEI, ARB, or CCB Black: thiazide or CCB
	< 60 y	≥140/90	<140/90	
	Diabetes	≥140/90	<140/90	Thiazide, ACEI, ARB, or CCB
	CKD	≥140/90	<140/90	ACEI or ARB
CHEP (2014)	≥ 80	≥160/100	<150/90	Non-Black: thiazide, ACEI, ARB, or CCB Black: thiazide, ARB, BB, CCB
	<80	≥160/100	<140/90	
	Pt w/ CV risk or target organ damage	≥140/90	<140/90	ACEI or ARB
	Diabetes	≥130/80	<130/80	Thiazide, ACEI, ARB, or CCB
ASH/ISH	< 80 y	≥140/90	<140/90	Non-Black (<60 y): ACEI or ARB Non-Black (≥60 y): CCB or thiazide (may consider ACEI or ARB) Black (all ages): CCB or thiazide
	≥ 80 y	≥150/90	<150/90	
	Diabetes	≥ 140/90	< 140/90	ACEI or ARB (black can consider CCB or thiazide)
	CKD	≥140/90	<140/90	ACEI or ARB
AHA/ACC /CDC	General population	≥140/90	<140/90	CAD/Post MI: BB, ACEI Systolic HF: ACEI or ARB, BB, aldosterone-antagonist, thiazide Diastolic HF: ACEI or ARB, BB, thiazide Diabetes: ACEI or ARB, thiazide, BB, CCB CKD: ACEI or ARB Stroke/TIA: thiazide or ACEI
Abbreviations: BB- beta-blocker, ACEI- angiotensin converting enzyme inhibitor, ARB- angiotensin receptor blocker, CAD - coronary artery disease, CCB - calcium channel blocker, CKD- chronic kidney disease, HF- heart failure, MI- myocardial infarction, TIA- transient ischemic attack.				

Special Therapeutic Consideration

The JNC8 recommends ACEI or ARBS for all patients with chronic kidney disease (CKD) and HTN, regardless of their ethnic background or diabetes status, to protect kidney function. One exception is noted for patients over the age of 75. The panel cited that ACEIs and ARBs may increase serum creatinine and risk of hyperkalemia. As a result, thiazide-type diuretics or CCBs are an acceptable alternative for patients over the age of 75 with decreased renal function.

Discussion

Even with the grade A rating, there is some controversy regarding the first recommendation which raises the BP goal in the general population of adults 60 years of age and older. For these patients, without diabetes or CKD, JNC8 recommends to initiate pharmacologic treatment when BP is $\geq 150/90$ to a goal of $< 150/90$ mm Hg. Currently, most guidelines are in agreement for BP goals of $< 150/90$ mm Hg for the oldest adults (those 80 years old or older); however, there remains controversy on BP goals in "young" older adults (65-80 years old).

There were six key studies used to support the goal blood pressure recommendations for the JNC8 guideline. The Hypertension in the Very Elderly Trial (HYVET), is the only study to date that demonstrated that antihypertensive treatment to a SBP goal of < 150 mm Hg in individuals aged 80 years and older is associated with reduction in CV outcomes.⁴ Three other RCTs (JATOS, VALISH, CARDIO-SIS) cited by JNC8 compare different SBP goals on CV outcomes among older adults. In the Japanese Trial to Assess Optimal Systolic BP in Elderly Hypertensive Patients (JATOS), the benefit of SBP reduction to < 140 mmHg (strict control) versus 140 to 159 mm Hg (mild-treatment) was evaluated in 4418 individuals aged 65 to 84 years with SBP ≥ 160 mm Hg at baseline. Differences in outcomes and mortality were not statistically significant.⁵ In another trial the benefit of SBP reduction to < 140 mmHg (strict control) versus 140 to 149 mm Hg (moderate-treatment) was evaluated in individuals aged 70 to 84.⁶ In both trials the incidences of CV outcomes were not significantly different across randomized arms. It is important to note that the lengths of study in both trials were relatively short and study cohorts were relatively healthy. Therefore, these trials had inadequate statistical power to detect benefits of the lower SBP goals. Additionally, generalizability of the Japanese trials to other patient populations is limited.

Recent guidelines from Europe⁷ and Canada⁸ have concluded that the appropriate cut point for an age-related differential SBP goal is 80 years or older and not 60 years, recommending a BP goal of $< 140/90$ mm Hg for patients aged 60-80 years (see Table 1). The American College of Cardiology Foundation/American Heart Association (ACCF/AHA) 2011, is the only guideline specifically tailored to hypertension in older adults and suggested that a target BP of $< 140/90$ mm Hg in persons aged 65 to 79 years and a target SBP of 140 to 145 mm Hg in persons aged 80 years and older, if tolerated.⁹ The authors of each of these guidelines have emphasized that very limited data exist to make definitive recommendations on the target BP goal in the elderly.

The 2013 European Society of Hypertension (ESH)/European Society of Cardiology (ESH/ESC) guidelines for the management of hypertension emphasized that available randomized trials of antihypertensive treatments in the elderly showed a reduction in cardiovascular disease (CVD) events by lowering BP but the average SBP achieved in trials was never < 140 mm Hg. Therefore, they suggested that elderly individuals with HTN should be treated to SBP levels of 140-149 mm Hg. In "fit" persons, aged less than 80 years, a SBP goal < 140 mm Hg may be considered, whereas in frail elderly individuals, they recommended that SBP goals be adapted to individual tolerability.⁷

The Canadian Hypertension Education Program (CHEP) guideline, is in agreement with ESH/ESC and recommends BP targets of SBP < 150 mm Hg for patients aged 80 years or older. However, it is a grade C recommendation

based on low-quality trials, invalidated surrogate outcomes, or results from non-randomized observational studies.⁸

Although these trials provide new knowledge about hypertensive treatment in the elderly, the optimal BP goal for the "young" elderly population remains unknown. Further studies, with longer durations of follow-up and populations with comorbidities are needed to guide clinical practice. Some experts believe increasing the target BP goal will reduce the intensity of antihypertensive treatment in a large population at high risk for CVD. This change would apply to populations who are underrepresented in the literature and considered to be at higher cardiovascular risk: African Americans, people with multiple chronic conditions, and those with established CVD. Some experts speculate that a higher SBP goal in individuals aged 60 years and older may reverse the decades-long trend of declining in CVD in particularly vulnerable American populations.¹⁰ Adding to the complexity of getting the elderly to their blood pressure goal is the issue of adverse effects, such as dehydration, orthostatic hypotension and renal insufficiency, which can be more pronounced in the elderly.

Conclusion

Clinical guidelines set out to identify, summarize, and evaluate quality evidence with the aim of guiding clinical decisions. However, high quality evidence regarding hypertension treatment goals remains limited, especially in special populations. There remains a critical knowledge gap on the optimal SBP target and a single SBP goal may not be appropriate for all older adults.

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References:

- 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*. 2013.
- Go AS, Bauman M, Coleman King SM, et al. An Effective Approach to High Blood Pressure Control: A Science Advisory From the American Heart Association, the American College of Cardiology, and the Centers for Disease Control and Prevention. *J Am Coll Cardiol*. 2014;63(12):1230-1238.
- Weber MA, Schiffrin EL, White WB, et al. Clinical practice guidelines for the management of hypertension in the community. A statement by the American Society of Hypertension and the International Society of Hypertension. *J Clin Hypertens* 2013.
- Bulpitt CJ, Beckett NS, Cooke J, et al. Hypertension in the Very Elderly Trial Working Group. Results of the pilot trial for the Hypertension in the Very Elderly Trial. *J Hypertens*. 2003;21:2409-17.
- JATOS Study Group. The Japanese Trial to Assess Optimal Systolic Blood Pressure in Elderly Hypertensive Patients (JATOS): protocol, patient characteristics, and blood pressure during the first 12 months. *Hypertens Res*. 2005;28:513-20.
- Ogihara T, Saruta T, Rakugi H, et al. Target blood pressure for treatment of isolated systolic hypertension in the elderly: valsartan in elderly isolated systolic hypertension study. *Hypertension*. 2010;56:196-202.
- Mancia G, Fagard R, Narkiewicz K, et al. 2013 ESH/ESC guidelines for the management of arterial hypertension: the task force for the management of arterial hypertension of the European Society of Hypertension (ESH) and of the European Society of Cardiology (ESC). *J Hypertens*. 2013;31:1281-357.
- DG, Quinn RR, Ravani P, et al. The 2013 Canadian Hypertension Education Program recommendations for blood pressure measurement, diagnosis, assessment of risk, prevention, and treatment of hypertension. *Can J Cardiol*. 2013; 29:528-542.
- Aronow WS, Fleg JL, Pepine CJ, et al. ACCF/AHA 2011 expert consensus document on hypertension in the elderly: a report of the American College of Cardiology Foundation Task Force on Clinical Expert Consensus Documents. *Circulation*. 2011;123:2434-506.
- Lackland DT, Roccella EJ, Deutsch AF, et al. American Heart Association Stroke Council, Council on Cardiovascular and Stroke Nursing, Council on Quality of Care and Outcomes Research, and Council on Functional Genomics and Translational Biology. Factors influencing the decline in stroke mortality: a statement from the American Heart Association/American Stroke Association. *Stroke*. 2014; 45:315-53.