

VIEWPOINT

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Hypertension in 2017—What Is the Right Target?

Setting blood pressure (BP) goals is not an exact science. Such goals have generally relied on findings from clinical trials that typically have differed in such important variables as age of participants, entry and exclusion criteria, presence or absence of concomitant illnesses, severity of hypertension, treatment regimens, and therapeutic goals. Furthermore, few previous trials have been designed to compare the effects of lowering BP to different targets.

Controversy exists currently on BP goals. For several years following publication of the JNC 7 report,¹ there appeared to be consensus regarding a goal BP of less than 140/90 mm Hg for most persons with hypertension, irrespective of age, and levels of less than 130/80 mm Hg for those with diabetes, chronic renal diseases, and certain cardiovascular conditions. However, 3 major groups have since made new and differing recommendations regarding BP goals, particularly in older persons, and the results of new trials have become available. The JNC 8 committee raised the systolic BP (SBP) goal for those aged 60 years or older to less than 150 mm Hg.² The European Society of Hypertension/European Society of Cardiology joint committee advocated a goal of less than 140 to 150 mm Hg for those aged 80 years or older.³ A joint committee representing the American Society of Hypertension and the International Society of Hypertension recommended a target of less than 150/90 mm Hg for those aged 80 years or older.⁴

Results of 2 relevant clinical studies, ACCORD and SPRINT, were recently published.⁵⁻⁷ Both trials were randomized, controlled, open-label studies that were designed to compare the effects of lowering SBP to either less than 140 mm Hg (standard care) or less than 120 mm Hg (intensive care) in individuals with hypertension. ACCORD was restricted to patients with both hypertension and diabetes whereas SPRINT excluded patients with diabetes. The treatment protocols were relatively similar in the 2 studies. In ACCORD, there was no significant difference in primary outcome between the intensive and standard care groups for patients with diabetes, although the stroke incidence was significantly decreased and a nonsignificant reduction in cardiovascular disease (CVD) events was observed with intensive treatment.

SPRINT recruited individuals aged 50 years or older who either had a history of or were at high risk for CVD. In addition to patients with diabetes, others excluded from SPRINT were individuals with a history of stroke and those who were not ambulatory or were confined to institutions. The study results revealed significant benefits of intensive vs standard therapy. The group whose designated goal SBP was less than 120 mm Hg, compared with the standard treatment group, experienced a 25% lower relative incidence of CVD (absolute rates, 5.2% vs 6.8%), a 43% lower relative CVD-related mor-

tality rate (absolute rates, 0.8% vs 1.4%), and a 27% lower relative all-cause mortality rate (absolute rates, 3.3% vs 4.5%). Another important finding was that patients aged 75 years or older benefitted to a similar extent as younger persons.⁷ Despite long-standing concerns about excessive lowering of diastolic BP (DBP) among patients with coronary heart disease, benefits were also observed among these patients even though DBP was reduced by an average of 6.2 mm Hg to an average level of 62 mm Hg, or 5 mm Hg less than with standard therapy.

These impressive results from SPRINT need to be examined carefully to assess their relevance to treatment in primary care settings, where most hypertensive persons are managed. Participants selected for clinical trials typically have less pretreatment conditions and complications than patients seen in clinical practices. More specific to SPRINT, because of the exclusion criteria, the SPRINT results would not be applicable directly to individuals with type 2 diabetes or prior stroke, nonambulatory elderly persons, and those residing in institutions. In addition, because SPRINT had to be terminated early for ethical reasons, the full effect of the benefits and adverse events of long-term therapy is unknown. Also, although the average BP achieved in the intensive therapy group was 14.8/7.6 mm Hg less than in the standard care group, the overall average SBP at 123 mm Hg did not achieve the target of less than 120 mm Hg.

A key caveat is that the BP measurements in SPRINT were made after several minutes of rest in contrast to shorter periods of rest used in most clinical settings. This would lead to higher observed SBP values in the typical clinical office setting than at SPRINT sites. How much higher is uncertain, but it may be on the order of 5 to 10 mm Hg, which would need to be corrected for when interpreting the SPRINT data. For example, the SBP goal of less than 120 mm Hg for SPRINT might be the equivalent of less than 125 to 130 mm Hg in the usual primary care setting. Nevertheless, this concern should not diminish the importance of the findings from SPRINT. Few studies in the history of control of hypertension have demonstrated such impressive reductions in mortality.

The HOPE-3 trial⁸ also has raised new issues about treating individuals at low or medium risk of CVD with cholesterol- and BP-lowering drugs, irrespective of pretreatment levels of low-density lipoprotein cholesterol or BP. This double-blind, randomized, placebo-controlled trial enrolled men aged 55 years or older and women aged 65 years or older with at least 1 major CVD risk factor, as well as women aged 60 years or older who had 2 or more CVD risk factors. Those with known CVD were excluded. The effects of rosuvastatin, a combination of candesartan and hydrochlorothiazide, or a triple combination of rosuvastatin-candesartan-hydrochlorothiazide were

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Figure. Suggested Blood Pressure Goals for Treatment of Hypertension

Population	Blood Pressure Goal, mm Hg		
	Age <50 y	Age 50-74 y	Age ≥75 y
General population	<120/80	<130 ^b	<140 ^c
High-risk population ^a	<130	<130 in presence of CVD or increased CVD risk or chronic kidney disease ^b <140 in presence of type 2 diabetes ^c	<140 ^c

^a Presence of cardiovascular disease (CVD) or increased CVD risk, chronic kidney disease, or diabetes.
^b Treat initially to systolic blood pressure of <140 mm Hg. If treatment is well tolerated, proceed to target goal of <130 mm Hg.
^c Treat to target systolic blood pressure goal of <140 mm Hg. If treatment is well tolerated, proceed to lower target of <130 mm Hg.

compared against placebo. In the initial report, which summarized data on the effects of the triple combination vs double placebo, the mean low-density lipoprotein cholesterol level with treatment was reduced by 33.7 mg/dL and the mean BP was reduced by 6.2/3.2 mm Hg compared with double placebo treatment.⁸ A significant decrease in the incidence of CVD (absolute rates, 3.6% vs 5.0%; relative reduction of 29%) was achieved in the total group of treated individuals receiving the rosuvastatin-candesartan-hydrochlorothiazide combination. Subgroup analyses revealed that individuals with pretreatment SBP in the upper tertile of values (>143 mm Hg) had greater benefits from treatment than those in the lower 2 SBP tertiles. While the results of HOPE-3 are of interest, particularly with respect to population-wide strategies to reduce CVD, the findings are not relevant to making practical recommendations about BP goals.

Another approach that has been advocated for guiding treatment of hypertension is to base antihypertensive therapy on total CVD risk rather than on specific BP levels. This issue has been debated for years, including during the deliberations of the JNC 6 and JNC 7 committees. Epidemiological data would support this approach, but controlled clinical trials are still lacking to validate the hypothesis.

Treatment decisions should continue to be guided by the actual BP values, although other factors also need to be considered. Gaps in knowledge exist and create uncertainties, but, as clinicians

know all too well, treatment decisions and recommendations may be required even when the evidence base is not conclusive. Accordingly, based on the available evidence, the following suggestions (Figure) represent a reasonable approach. Because of the importance of diastolic hypertension in younger individuals, DBP goals also are included for those younger than 50 years.

First, for most adults younger than 50 years, despite the lack of definitive clinical trial data, the goal BP of less than 120/80 mm Hg is recommended based on the wealth of epidemiological data demonstrating an almost linear increase in CVD risk with increasing BP levels above this goal. In the presence of CVD, chronic renal disease, or diabetes, an SBP goal of less than 130 mm Hg seems appropriate. Since the majority of young persons with hypertension have stage 1 hypertension, lifestyle measures should be used initially in most before initiating medications.

Second, for individuals between 50 and 74 years old, a long-term SBP goal of less than 130 mm Hg is appropriate for most patients. However, because of some uncertainties, it would be prudent to first achieve a target of less than 140 mm Hg, and then if treatment to that target is well tolerated, proceed to the lower goal. This approach is recommended irrespective of the presence or absence of CVD or chronic kidney disease. In individuals with type 2 diabetes, the long-term target currently should be an SBP level of less than 140 mm Hg, although a somewhat lower target might be considered in view of the observed benefit of reducing stroke incidence with intensive therapy in ACCORD.⁵

Third, for persons aged 75 years or older, more than 75% of whom have hypertension, reduction of SBP is clearly beneficial, but the exact SBP goal is still unclear. At present, a goal of less than 140 mm Hg appears reasonable but should be achieved by careful titration of medications and monitoring for orthostatic hypotension and changes in renal function and cognition. For individuals who tolerate treatment well, further efforts might be made to reach a target of less than 130 mm Hg, but this may occur in a minority of patients.⁹

The ultimate goal should be to prevent hypertension. Efforts should be intensified rather than simply acknowledged. For persons with prehypertension, particularly with BP levels in the 130-139/85-89 mm Hg range, adoption of healthy lifestyles should be stressed by clinicians to their patients. In addition, use of statins and efforts to stop smoking should be considered in all persons with hypertension to reduce cardiovascular complications.

ARTICLE INFORMATION

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REFERENCES

- 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. *JAMA*. 2003; 289(19):2560-2572.
- James PA, Oparil S, Carter BL, et al. 2014 evidence-based guideline for the management of high blood pressure in adults. *JAMA*. 2014;311(5):507-520.
- Mancia G, Fagard R, Narkiewicz K, et al. 2013 ESH/ESC guidelines for the management of arterial hypertension. *J Hypertens*. 2013;31(7):1281-1357.
- Weber MA, Schiffrin EL, White WB, et al. Clinical practice guidelines for the management of hypertension in the community. *J Hypertens*. 2014; 32(1):3-15.
- Cushman WC, Evans GW, Byington RP, et al. Effects of intensive blood-pressure control in type 2 diabetes mellitus. *N Engl J Med*. 2010;362(17):1575-1585.
- Wright JT Jr, Williamson JD, Whelton PK, et al. A randomized trial of intensive vs standard blood-pressure control. *N Engl J Med*. 2015;373(22):2103-2116.
- Williamson JD, Supiano MA, Applegate WB, et al. Intensive vs standard blood pressure control and cardiovascular disease outcomes in adults aged ≥75 years. *JAMA*. 2016;315(24):2673-2682.
- Yusuf S, Lonn E, Pais P, et al. Blood-pressure and cholesterol lowering in persons without cardiovascular disease. *N Engl J Med*. 2016;374(21):2032-2043.
- Chobanian AV. SPRINT results in older patients. *JAMA*. 2016;315(24):2669-2670.