

# Recent changes in the treatment of hypertension

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## ABSTRACT

Hypertension affects a large portion of the United States' population and is a significant risk factor for cardiovascular events. A variety of treatment guidelines exist including the American Diabetes Association, European Society of Hypertension/European Society of Cardiology and the Joint National Committee on Prevention, Detection, Evaluation, and Treatment of High Blood Pressure guidelines. The following is a summary of these guidelines regarding the effective treatment of hypertension.

## KEYWORDS

Hypertension, guidelines, JNC7

## INTRODUCTION

Hypertension is defined by having a blood pressure greater than or equal to 140/90 mmHg, being currently prescribed antihypertensive medications or being told by a healthcare provider twice that one has hypertension. In the United States, hypertension affects between 67 and 78 million adults and is estimated to cost \$69.9 billion.<sup>1</sup> Hypertension control has been a target of many initiatives likely due to estimates that only 52.5% of patients with hypertension are considered to have their hypertension controlled, and because it is considered to be the greatest risk factor for stroke.<sup>1,2</sup> Hypertension is also a risk factor for a variety of cardiovascular events including, myocardial infarction, sudden death, heart failure, and peripheral artery disease.<sup>2</sup> Although hypertension is considered a cardiovascular risk, a comprehensive total cardiovascular risk assessment is imperative in regards to treatment.

The long awaited update to the Seventh Report of the Joint National Committee on Prevention, Detection, Evaluation, and Treatment of High Blood Pressure guidelines (JNC 7) was released in December 2013. Prior to the release of these guidelines a number of entities had provided updates including, the American Diabetes Association, European Society of Hypertension (ESH), European Society of Cardiology (ESC), the American Heart Association (AHA), the American College of Cardiology (ACC), and the Center for Disease Control and Prevention (CDC), which released a statement regarding the treatment of hypertension in November 2013.

## AMERICAN DIABETES ASSOCIATION

In January 2013 the American Diabetes Association (ADA) released the Standards of Medical Care in Diabetes that recommended a change in previous hypertension goal for patients with diabetes. This recommendation was the same for the 2014 Standard of Medicare Care released in January 2014. The goal blood pressure for patients with diabetes is systolic blood pressure (SBP) < 140 mmHg and a diastolic blood pressure (DBP) of < 80 mmHg.<sup>3,4</sup> The 2013 and 2014 guidelines recognize that a lower goal of < 130 mmHg may be appropriate for patients who are younger (patients with a long life expectancy), or with an increased stroke risk, and for those that can achieve this goal without undue treatment burden.<sup>3,4</sup> The previous 2012 ADA guidelines recommended a systolic blood pressure of < 130 mmHg and DBP < 80 mmHg for most patients with diabetes, and also mentioned that the SBP can be higher or lower than 130 mmHg based on certain patient characteristics.<sup>5</sup> The blood pressure goal change from a SBP of < 130 mmHg to SBP < 140 mmHg is based on evidence from clinical trials that a SBP < 130 mmHg was not associated with improved cardiovascular outcomes compared to a SBP target of 130 – 149 mmHg.<sup>3,4</sup> The guidelines do recognize that a lower SBP target may reduce the risk of stroke and albuminuria, which supports the recommendation of a lower SBP target of < 130 mmHg for some patients.<sup>3,4</sup> First-line pharmacotherapy treatment options include an angiotensin converting enzyme (ACE) inhibitor or angiotensin receptor blocker (ARB) due to the ability to block the renin-angiotensin system (RAS) and the positive benefits this effect has on reducing cardiovascular outcomes.<sup>3,4</sup> Additional pharmacological treatment options include a diuretic, calcium channel blocker or

beta-blocker.<sup>3,5</sup> Dual pharmacotherapy is generally required, and the ADA does recommend that one of these medications be given at bedtime based on a randomized controlled trial that demonstrated that bedtime administration reduced cardiovascular events and mortality.<sup>4,5</sup> Non-pharmacologic options to consider include weight loss if obese, adhering to Dietary Approaches to Stop Hypertension (DASH) diet, moderate alcohol intake, and increased physical activity.<sup>3,6</sup>

### THE EUROPEAN SOCIETY OF HYPERTENSION (ESH) AND EUROPEAN SOCIETY OF CARDIOLOGY (ESC)

The European Society of Hypertension (ESH) and European Society of Cardiology (ESC) released guidelines for hypertension management in July 2013. The ESH and ESC blood pressure goal is less than 140/90 mmHg with the exception of less than 140/85 mmHg in patients with diabetes. The ESH/ESC guidelines also allow for some variation based on age, with a SBP goal between 140 – 150 mmHg for patients over 80. The guidelines allow for a flexible SBP goal for elderly patients less than 80 years of age and older than 65 years of age with a goal of < 140 mmHg if physically fit. First-line pharmacological treatment options as monotherapy or combination therapy include, diuretics, beta-blockers, calcium antagonists, angiotensin converting enzyme (ACE) inhibitors and angiotensin receptor blockers (ARB). Preferred combination therapy includes, thiazide + ACE inhibitors, thiazide + ARB, thiazide + calcium antagonists, ACE + calcium antagonists or ARB + calcium antagonists. The guidelines do provide a table of hypertensive drugs to be considered in the presence of compelling indications and possible contraindications for use. Non-pharmacological interventions to help reduce blood pressure include salt restriction, moderate alcohol consumption, high consumption of vegetables and fruits and low fat and other diets, reduce and/or maintain weight, and regular physical activity. These guidelines also specifically recommend the use of pharmacists or nurses in the team-based care of patients with hypertension.<sup>2</sup>

### AHA/ACC/CDC SCIENCE ADVISORY

In November 2013 the American Heart Association (AHA), the American College of Cardiology (ACC), and the Center for Disease Control and Prevention (CDC) released a science advisory discussing the effective approach to high blood pressure control. This science advisory includes a treatment algorithm that recommends the following based on SBP and DBP:

1. Stage 1 hypertension diagnosed if SBP is 140-159 or DBP 90-99
  - a. Initiate lifestyle modifications
  - b. Consider addition of a thiazide diuretic
2. Stage 2 hypertension diagnosed if SBP > 160 or DBP > 100
  - a. Initiate lifestyle modifications
  - b. Initiation of a two drug combination is preferred; acceptable combinations include:
    - Thiazide plus an ACE inhibitor, ARB, or calcium channel blocker (CCB)
    - ACE inhibitor and CCB

The advisory recommends a blood pressure goal of < 140 and < 90 for most people but the goal may be lower in patients with diabetes, African-Americans, elderly, patients with left ventricular hypertrophy, systolic or diastolic dysfunction, or chronic kidney disease. The advisory encourages lifestyle modifications including weight reduction (maintain BMI of 18.5 – 24.9 kg/m<sup>2</sup>), diet rich in fruits, vegetables, and low-fat dairy products (DASH diet), lower sodium intake (no more than 2400 mg/day), regular physical activity of at least 30 minutes per day most days of the week and to limit alcohol consumption.<sup>1</sup>

### 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)

In December 2013 a report from the panel members appointed to the JNC 8 guidelines were released and recommended the following blood pressure treatment recommendations.<sup>7</sup>

- General population ≥ 60 years: treat to a SBP <150 mmHg and DBP < 90 mmHg. This population can achieve a lower SBP of < 140 if well tolerated.
- General population < 60 years: treat to a SBP < 140 mmHg and DBP < 90 mmHg. This is also the blood pressure goal for patients with diabetes and those with chronic kidney disease.
- The change in blood pressure goals from previous recommendations is based on the literature available since 2003, which is when JNC 7 was released.
- The report recognizes that patients controlled with a SBP < 140 mmHg can continue current therapy.

The JNC 7 guidelines were released in 2003 and recommended the following blood pressure goals.<sup>8</sup>

**Table 1: Summary of blood pressure goals<sup>1-4,7</sup>**

	Patient Population	Blood Pressure Goals	Comments
<b>American Diabetes Association</b>	Patients with diabetes	SBP < 140 mmHg DBP < 80 mmHg	SBP goal of < 130 mmHg may be appropriate for patients who are younger (patients with a long life expectancy), an increased stroke risk, or if this goal can be achieved without side effects and with few pharmacological options
<b>The European Society of Hypertension (ESH) and European Society of Cardiology (ESC)</b>	General Population	SBP < 140 mmHg DBP < 90 mmHg	Patients > 80 years of age, a SBP goal 140 – 150 mmHg Patients < 80 years of age, a SBP goal < 140 mmHg if physically fit
	Patients with diabetes	SBP < 140 mmHg DBP < 85 mmHg	
<b>AHA/ACC/CDC Science Advisory</b>	General Population	SBP < 140 mmHg DBP < 90 mmHg	Lower goals may be appropriate in specific patient populations (diabetes, African-Americans, elderly, left ventricular hypertrophy, systolic or diastolic dysfunction, or chronic kidney disease)
<b>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)</b>	General population ≥ 60 years	SBP < 150 mmHg DBP < 90 mmHg	If patients are currently tolerating a lower SBP goal of < 140 mmHg, continue current therapy.
	General population < 60 years	SBP < 140 mmHg DBP < 90 mmHg	
	Patients with diabetes and those with chronic kidney disease	SBP < 140 mmHg DBP < 90 mmHg	

- General population SBP < 140 mmHg and DBP < 90 mmHg
- Population with diabetes or chronic kidney disease SBP < 130 mmHg and DBP < 80 mmHg. This goal was consistent with the ADA guidelines until their update in 2013.

The 2013 report from the JNC-8 panel members recommend that initial hypertensive therapy include the use of thiazide-type diuretic, calcium channel blocker (CCB), angiotensin converting enzyme inhibitor, or angiotensin receptor blocker for most patients, including those with diabetes. Combination therapy can include any of the medication classes with the exception of combination with an ACE inhibitor and ARB. Recommendation for initial hypertension therapy was a change from JNC-7 guidelines that had recommended thiazide-type diuretics for most patients as initial therapy. The exception is the use of thiazide-type diuretic or CCB as first line treatment for the African American patient population.<sup>7</sup>

## CONCLUSION

The biggest change with the updated hypertension treatment guidelines is the simplified goal of < 140/90 for most patients. Consistent across guidelines is the extensive role that lifestyle changes can have on blood pressure treatment.

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