

**Is a sodium-restricted diet more effective in the African-American population versus other ethnic groups for reducing blood pressure?
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Multiple guidelines make recommendations regarding dietary sodium intake in patients with hypertension (see Appendix 1 for summary).¹⁻⁵ In general, the guidelines recommend sodium restriction in patients with hypertension as high sodium diets may elevate blood pressure.

Several guidelines also address the effects of sodium in different racial groups. The American Society of Hypertension (ASH) and the International Society of Hypertension (ISH) note that compared to white patients, black patients are more sensitive to the effects of sodium on blood pressure.⁵ The European Society of Hypertension (ESH) and the European Society of Cardiology (ESC) assert that sodium reduction has a greater effect in patients who are older, or black, as well as those patients with diabetes, metabolic syndrome, or chronic kidney disease.^{4,6,7} The International Society on Hypertension in Blacks (ISHIB) (2010) notes that salt hypersensitivity is more common in black patients with hypertension compared to whites.¹

The eighth report of the Joint National Committee for Prevention, Detection, Evaluation, and Treatment of High Blood Pressure (JNC8) and the American Heart Association (AHA), American College of Cardiology (ACC), and the Centers for Disease Control and Prevention (CDC) guidelines for hypertension do not address sodium restriction or make recommendations specific to black patients.^{2,3} However, the JNC8 makes recommendations regarding sodium intake in a supplementary algorithm and suggests reducing sodium intake to $\leq 2,400$ mg/day in all patients.⁸

In addition to the guidelines, a recent Cochrane systematic review evaluated the effects of low- and high-sodium intake on blood pressure, cholesterol, and several hormones.⁹ Graudal et al utilized several databases for randomized controlled trials (1946 – April 2016), which assessed the effects of a low- or high-sodium diet in Asian, black, and white patients who reduced their sodium intake from an average of 11.5 g/day (high) to an average of 3.8 g/day (low).

The authors included 185 trials (N=12,210) in the analysis and reported results based on whether patients had hypertension or normotension.⁹ Specific to hypertension, the authors reported mean differences (MD) in systolic blood pressure (SBP) and diastolic blood pressure (DBP) measurements in Asian, black, and white patients (see Table 1). The SBP and DBP measurements were compared between patients on a low- versus high-sodium diet. Sensitivity analyses also showed no significant differences after exclusion of studies which caused asymmetry.

Table 1: Mean changes in BP after dietary sodium restriction in patients with hypertension (by race).⁹

Patient population*	MD in SBP	MD in DBP
Asian	-7.75 mmHg (95% CI -11.44 to -4.07; p<0.0001)	-2.68 mmHg (95% CI -4.21 to -1.15; p=0.0006)
Black	-6.64 mmHg (95% CI: -9.00 to -4.27; p=0.00001)	-2.91 mmHg (95% CI: -4.52 to -1.30; p=0.0004)
White	-5.51 mmHg (95% CI: -6.45 to -4.57; p<0.00001)	-2.88 mmHg (95% CI: -3.44 to -2.32; p<0.00001)

BP=blood pressure; CI=confidence interval; DBP=diastolic blood pressure; MD=mean differences; SBP=systolic blood pressure.

*For Asian patients: data from 9 studies and 501 patients; for black patients: data from 8 studies and 619 patients; for white patients: data for SBP from 84 studies and 5,925 patients; data for DBP from 85 studies and 6,001 patients.

The authors concluded that dietary sodium reduction may be considered as a supplementary option for white patients with hypertension based on the large number of trials that have been conducted.⁹ Although there was a larger effect on blood pressure in Asian and black patients compared to white patients, the results were limited by the small number of studies in these groups. Other notable limitations involve the large number of trials that were not double-blinded and the heterogeneous patient population across trials in terms of baseline blood pressure, age, and sodium intake.

To summarize, several guidelines address dietary sodium intake and its effects on blood pressure.^{1,4,5,8} The ASH/ISH, ESH/ESC, and ISHIB assert that black patients are more sensitive to the effects of sodium on blood pressure compared to white patients.^{1,4,5} Graudal et al conducted a recent Cochrane systematic review and concluded that Asian and black patients with reduced dietary sodium intake experienced greater blood pressure-lowering effects compared to white patients.⁹ However, the study's limitations preclude a definitive conclusion regarding sodium intake, race, and effects on blood pressure. Therefore, based on these results and guideline recommendations, reduced sodium intake is recommended for all patients with hypertension. However, until additional trials are published, healthcare professionals should emphasize dietary sodium restriction for black patients given that this population may be more sensitive to the effects of sodium on blood pressure.

References:

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Appendix 1: Summary of guidelines' recommendations regarding sodium restriction.

Guideline	Recommendations
AHA/ACC/CDC (2014) ²	<ul style="list-style-type: none"> • Does not address sodium restriction or recommendations specific to black patients
ASH/ISH (2014) ⁵	<ul style="list-style-type: none"> • Recommends sodium restriction for all patients as high sodium diets may cause hypertension • Notes that black patients are more sensitive to the effects of sodium on elevation of BP compared to white patients; cultural differences may account for differences as high sodium foods (e.g., canned goods, fast food, processed meats) are often part of traditional diets
ESH/ESC (2013) ⁴	<ul style="list-style-type: none"> • Recommends sodium restriction (maximum of 5-6 g per day) to reduce BP • Based on studies, sodium reduction has a greater effect in patients who are older, black, and those with diabetes, metabolic syndrome, or chronic kidney disease.^{6,7} Salt restriction may allow for reduced dosages and number of antihypertensive agents
ISHIB (2010) ¹	<ul style="list-style-type: none"> • Notes that salt hypersensitivity is more common in black patients with hypertension compared to whites
JNC8 (2014) ^{3,8}	<ul style="list-style-type: none"> • Full guideline does not address sodium restriction or make recommendations specific to black patients. Supplemental algorithm recommends reducing sodium intake $\leq 2,400$ mg/day

ACC=American College of Cardiology; AHA=American Heart Association; ASH=American Society of Hypertension; BP=blood pressure; CDC=Centers for Disease Prevention and Control; ESC=European Society of Cardiology; ESH=European Society of Hypertension; ISH=International Society of Hypertension; ISHIB=International Society on Hypertension in Blacks; JNC8=Joint National Committee for Prevention, Detection, Evaluation, and Treatment of High Blood Pressure