

# Abstract

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## The Role of Vascular Biology, Nutrition and Nutraceuticals in the Prevention and Treatment of Hypertension

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**BACKGROUND:** Vascular biology plays a primary and pivotal role in the initiation and perpetuation of hypertension and subsequent target organ damage. Endothelial activation and dysfunction, oxidative stress and vascular smooth muscle dysfunction (hypertrophy, hyperplasia, remodeling) may be some of the first events that trigger essential hypertension. Nutrient-gene interactions determine specific phenotype consequences of either vascular health, vascular disease or hypertension. Optimal nutrition, nutraceutical supplements, vitamins, antioxidants, minerals, weight loss, exercise, smoking cessation and judicious restriction of alcohol and caffeine as well as other lifestyle modifications can prevent, delay the onset, reduce the severity, treat and control the essential hypertension of many patients. An integrative and synergistic approach combining these lifestyle modifications with appropriate pharmacologic treatment is most likely to achieve new goal blood pressure levels, reduce risk factors for vascular disease, improve vascular biology and vascular health, optimize target organ protection and reduce coronary heart disease, stroke, congestive heart failure and renal disease.

**SUMMARY:** This paper will review the expanded scientific roles for nutrition and nutraceutical supplements in the prevention and treatment of essential hypertension with specific emphasis on mechanisms of action, clinical use and integration with drug therapy as indicated, based in part on the Joint National Committee's 6<sup>th</sup> Report (JNC-VI) and other national and global hypertension guidelines.

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