

Patient's Guide to Chronic Hypertension: An Evidence-Based Review of Dietary, Nutritional, Exercise, and Integrative Treatments for High Blood Pressure



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*"Every day is an opportunity
to become healthier!"*

Dr Alex Vasquez

Western States Chiropractic College, Class of March 1996

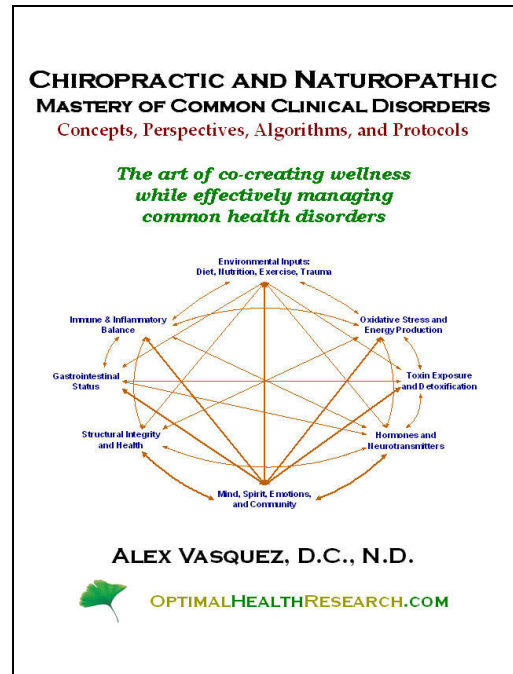
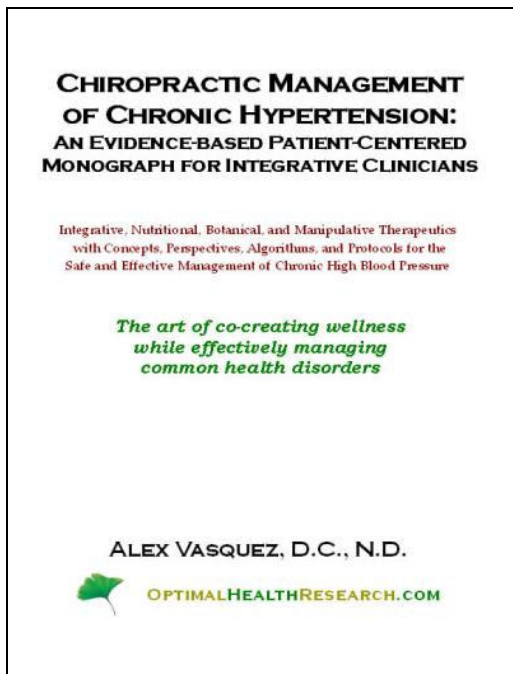
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Notice to Doctors: The information in this book for patients is derived from a textbook for doctors written by Dr Alex Vasquez entitled “*Chiropractic Management of Chronic Hypertension: An Evidence-Based Patient-Centered Monograph for Integrative Clinicians*” available from http://OptimalHealthResearch.com/monograph_hypertension_chiropractic.html; this monograph on hypertension is an update from the chapter on hypertension published in “*Chiropractic and Naturopathic Mastery of Common Clinical Disorders*” and available from http://OptimalHealthResearch.com/clinical_mastery.html



Coenzyme Q-10 (CoQ-10): A vitamin-like substance produced within the body and present in each cell, CoQ-10 when taken as a dietary supplement helps to reduce high blood pressure and to protect the heart and kidneys

Introduction and Summary: Co-enzyme Q-10 is also called “ubiquinone” (you’-bick-win’-öne), CoQ-10, and Co-Q. Here, we will refer to it as CoQ-10; it is found in every cell of the body, where it is produced from cholesterol. While it is available in limited amounts from food (average dietary intake of CoQ-10 is 2-5 mg/d), most CoQ-10 in the body is made endogenously, within the body. Some patients—particularly those with migraines, asthma, hypertension, allergies, heart failure and a heart disease called idiopathic dilated cardiomyopathy—may have an inborn or acquired error of metabolism that prevents them from making sufficient amounts of this vitally important substance. These patients tend to benefit from supplementation with CoQ-10. The standard dose for supplementation is 180-240 mg per day according to most studies; however doses ranging from 60 mg up to 1,500 mg can also be used.

Safety: Because it is present in every cell of the body and is required for life, CoQ-10 is very safe when taken as a dietary supplement. Hardly any risks are present for the vast majority of people. People taking the drug Coumadin (also known as warfarin) should take CoQ-10 a few hours away from their warfarin/Coumadin because CoQ-10 may interfere with the absorption of the drug; these patients should continue to have their regularly scheduled laboratory tests (ie, INR) in order to ensure that their medication continues to work properly. With very high doses of CoQ-10 in the ranges of 1,000 – 3,000 mg, some patients might show signs of mild liver involvement which is reversible when the dose is reduced; most patients don’t need to take such high doses and therefore CoQ-10 is very safe for the vast majority of people.

Laboratory testing: Laboratory testing is not required before the use of CoQ-10 supplementation, and certainly the vast majority of people who have benefited from and who have use CoQ-10 supplementation have done so without the use of laboratory testing. As mentioned previously certain diseases are associated with low blood levels of CoQ-10. Whether this deficiency causes the disease or results from the disease is sometimes not clear; but what is clear is that these patient groups tend to benefit from CoQ-10 supplementation. The conditions with the best research support for showing benefit from CoQ-10 supplementation are migraine headaches, asthma (particularly in children), high blood pressure (chronic hypertension), allergies, heart failure and a heart disease called idiopathic dilated cardiomyopathy. New research has also shown benefit for patients with chronic renal failure, including patients requiring dialysis. Typical blood levels of CoQ-10 range from 0.7-1 mcg/ml; however clinical benefit in the treatment of cardiovascular disease may require serum levels of 2-3 and up to 4 mcg/ml to attain maximal clinical benefit.⁹⁰ While testing of serum CoQ-10 levels is not necessary before starting treatment; patients who do not benefit as expected should have their CoQ-10 levels measured and supplementation increased to attain optimal serum levels before deciding that treatment is ineffective. While clinical benefit may occur within the first week of supplementation, maximal

⁹⁰ Kumar A, Kaur H, Devi P, Mohan V. Role of coenzyme Q10 (CoQ10) in cardiac disease, hypertension and Meniere-like syndrome. *Pharmacol Ther.* 2009 Dec;124(3):259-68

improvement generally takes 4-8 weeks in order to obtain tissue saturation and beneficial changes in cell physiology.

Forms available: CoQ-10 has generally been produced and studied in its form as “ubiquinone” however some newer research suggest that the reduced form “ubiquinol” is better absorbed and is a more effective antioxidant; the clinical benefit of this newer form of CoQ-10 is not clear, and it’s increased cost may not be justifiable, particularly as CoQ-10 is already one of the more expensive nutritional supplements. Furthermore, CoQ-10 is available as a powder in capsules, as liquid gels, and in emulsified forms; generally, the dry powder provides the best cost-effectiveness. The other forms may provide slightly better absorption when taken on an empty stomach, but if CoQ-10 is taken with a small amount of fatty food, the absorption is about the same while the cost is certainly lower with dry CoQ-10 powder in capsules.

Clinical applications—Focus on High Blood Pressure (Hypertension): High blood pressure (increased pressure of the blood inside the arteries) causes damage to the artery walls and promotes occlusion of arteries; when the blood can no longer flow to the organ being serviced, the organ itself can be damaged (partially or completely) due to lack of oxygen and nutrient delivery. Occlusion of an artery servicing the heart can result in heart attack, while occlusion of an artery servicing the brain can lead to a stroke; occlusion of an artery to a limb or the intestine can cause that part of the body to be damaged or die. In addition to *heart attack* and *stroke* and other forms of *peripheral vascular disease*, chronic HBP can also cause *heart failure* and *kidney damage*. **Effective lowering of blood pressure in patients with HBP is generally considered the single most important preventive measure in helping people avoid cardiovascular disease (any one of the triad of heart attack, stroke, or heart failure), hypertensive kidney damage, and peripheral vascular disease.**

In hypertensive patients, CoQ-10 doses of 60-120 mg/d can typically lower BP by about -15/-9 mm Hg. CoQ-10 can be safely used with antihypertensive medications and is generally safer than antihypertensive medications. This is not necessarily to say that CoQ-10 is superior in all clinical situations when managing HTN; fast-acting drugs are needed in urgent and emergency situations. However, CoQ-10’s numerous collateral benefits and its superior safety make CoQ-10 a very reasonable treatment option for many people with HBP. In the paragraphs that follow here, various representative examples of published research will be reviewed to present CoQ-10’s beneficial effects on cardiovascular health.

1. Review: Role of coenzyme Q10 (CoQ10) in cardiac disease, hypertension and Meniere-like syndrome: In this excellent review that covers the role of CoQ-10 in the treatment of various cardiovascular diseases (heart failure, HTN, heart attack, arrhythmia, Kumar et al⁹¹ review the research literature to conclude that CoQ-10 provides major clinical benefit in all of these conditions and without adverse effects. Cardioprotective properties of CoQ-10 include its role as an antioxidant, vasodilator, and membrane stabilizer in

⁹¹ Kumar A, Kaur H, Devi P, Mohan V. Role of coenzyme Q10 (CoQ10) in cardiac disease, hypertension and Meniere-like syndrome. *Pharmacol Ther.* 2009 Dec;124(3):259-68

addition to its ability to decrease blood viscosity (ie, CoQ-10 makes blood flow more easily), proinflammatory chemicals called cytokines, insulin resistance (ie, CoQ-10 makes insulin work better; this is very important for diabetics), and to help the heart function as a more efficient pump. According to this review article, **blood pressure reduction with use of CoQ10 can be as high as -18/-11**, depending on the dose and the attained blood levels. To improve effectiveness, other common nutritional deficiencies such as magnesium, potassium, and vitamin D can also be addressed to improve effectiveness and to promote further normalization of blood pressure. Maximal improvement might take 4-8 weeks; however, some patients will respond more quickly—within the first week. Patients with HBP who are taking medications need to monitor their blood pressure on a regular basis so that once CoQ-10 begins to take effect (perhaps as soon as the first week), their drug doses can be reduced so that blood pressure does not become *too low*. By itself, CoQ-10 never causes blood pressure to get too low; however, if someone has high blood pressure due to CoQ-10 deficiency and then that deficiency is corrected, blood pressure lowering drugs—if still being used—could cause the blood pressure to get too low. Low blood pressure can contribute to a feeling of fatigue, but it can also cause dizziness and faintness.

2. Randomized, double-blind, placebo-controlled trial of coenzyme Q10 in isolated systolic hypertension: Twice daily administration of 60 mg of oral CoQ-10 (total dose per day = 120 mg) was given to 46 men and 37 women with isolated systolic hypertension in a 12-week randomized, double-blind, placebo-controlled trial. The authors of this study published in *Southern Medical Journal* concluded, “RESULTS: The mean reduction in systolic blood pressure of the CoQ-treated group was -17.8 mm Hg. None of the patients exhibited orthostatic blood pressure changes [This means that the patients did not get dizzy or faint]. CONCLUSIONS: Our results suggest **CoQ may be safely offered to hypertensive patients as an alternative treatment option.**”⁹²
3. Clinical trial with water-soluble CoQ-10: Effect of hydrosoluble coenzyme Q10 on blood pressures and insulin resistance in hypertensive patients with coronary artery disease: In this randomized double-blind placebo-controlled trial among 59 patients receiving antihypertensive medication and with coronary artery disease, patients received oral coenzyme Q10 (60 mg twice daily = 120 mg per day) for 8 weeks. **In the coenzyme Q10 group, beneficial reductions were noted in systolic and diastolic blood pressures. The average blood pressure of 168/106 was reduced by CoQ-10 to 152/97 for a drop of -16/-9.** Other benefits included a reduction in heart rate (ie, heart rate was reduced because the heart was working more efficiently), reduction in waist-hip ratio (ie, better body fat distribution), insulin and glucose levels (ie, better diabetic control), reduction in triglyceride levels (ie, reductions in the amount of fat in the blood) and reductions in angina (ie, less chest pain). An additional benefit is that CoQ-10 supplementation raised the “good cholesterol” known as HDL-cholesterol. The authors of this research, published in *Journal of Human Hypertension*, concluded, “These findings indicate that **treatment with coenzyme Q10 decreases blood pressure** possibly by decreasing

⁹² Burke BE, Neuenschwander R, Olson RD. Randomized, double-blind, placebo-controlled trial of coenzyme Q10 in isolated systolic hypertension. *South Med J*. 2001 Nov;94(11):1112-7

- oxidative stress and insulin response in patients with known hypertension receiving conventional antihypertensive drugs.”⁹³
4. Open trial using average dose of CoQ-10 225 mg/d for the treatment of essential hypertension with coenzyme Q10: This is an important study because it is one of the few studies that actually tailored the dose of the CoQ-10 to the patient’s response by monitoring CoQ-10 levels in the blood. Researchers customized the dose to attain blood CoQ10 levels of at least 2 mcg/ml. The authors of this study, published in a medical journal named *Molecular Aspects of Medicine*, describe the design and findings of their study as follows: “A total of 109 patients with symptomatic essential hypertension presenting to a private cardiology practice were observed after the addition of **CoQ10 (average dose, 225 mg/day by mouth)** to their existing antihypertensive drug regimen. ... **A definite and gradual improvement in functional status was observed with the concomitant need to gradually decrease antihypertensive drug therapy within the first one to six months.** Thereafter, clinical status and cardiovascular drug requirements stabilized with a **significantly improved systolic and diastolic blood pressure.** Overall New York Heart Association (NYHA) functional class improved from a mean of 2.40 to 1.36 ($P < 0.001$) and **51% of patients came completely off of between one and three antihypertensive drugs at an average of 4.4 months after starting CoQ10.** ... In the 9.4% of patients with echocardiograms both before and during treatment, we observed a highly significant improvement in left ventricular wall thickness and diastolic function.”⁹⁴
 - Open trial with low-dose CoQ-10 reduced BP -18/-12, reduced total cholesterol -9, and raised HDL +2: In this open trial with no comparative placebo group (*just like clinical practice!*), 26 patients with essential hypertension received oral CoQ-10 50 mg twice daily (100 mg per day) for 10 weeks. For this study published in *Molecular Aspects of Medicine*⁹⁵, major findings were as follows: systolic blood pressure (SBP) decreased from 164.5 to 146.7 mmHg and diastolic blood pressure (DBP) decreased from 98.1 to 86.1 mmHg; thus **the blood pressure reduction by CoQ-10 was -17.8/-12.** Serum total cholesterol decreased from 222.9 mg/dl to 213.3 mg/dl and the good HDL cholesterol increased from 41.1 mg/dl to 43.1 mg/dl. In a subset of patients for whom appropriate measures were obtained, total peripheral resistance decreased from 2,283 to 1,627 dyne/sec/cm-5—this means that their artery walls were more distensible, and arterial wall distensibility is an important marker for cardiovascular health. These anti-hypertensive results, the collateral benefits, and the absence of adverse effects make CoQ-10 appear superior to drug treatment for chronic HTN.
 - Correlational study: CoQ-10 is an independent predictor of mortality in chronic heart failure: Plasma samples from 236 patients admitted to the hospital with heart failure were assayed for LDL and total cholesterol, and total CoQ-10. Authors of this study, published in *American Journal of Cardiology*, wrote, “CONCLUSIONS: Plasma CoQ-10 concentration was an independent predictor of mortality in this cohort. The **CoQ-10 deficiency might be detrimental to the long-term prognosis of CHF [chronic heart failure]**, and there is a rationale for controlled intervention studies with CoQ-10.”⁹⁶

⁹³ Singh RB, Niaz MA, Rastogi SS, Shukla PK, Thakur AS. Effect of hydrosoluble coenzyme Q10 on blood pressures and insulin resistance in hypertensive patients with coronary artery disease. *J Hum Hypertens.* 1999 Mar;13(3):203-8

⁹⁴ Langsjoen P, Langsjoen P, Willis R, Folkers K. Treatment of essential hypertension with coenzyme Q10. *Mol Aspects Med.* 1994;15 Suppl:S265-72

⁹⁵ Digiesi V, Cantini F, Oradei A, Bisi G, Guarino GC, Brocchi A, Bellandi F, Mancini M, Littarru GP. Coenzyme Q10 in essential hypertension. *Mol Aspects Med.* 1994;15 Suppl:s257-63

⁹⁶ Molyneux SL, Florkowski CM, George PM, Pilbrow AP, Frampton CM, Lever M, Richards AM. Coenzyme Q10: an independent predictor of mortality in chronic heart failure. *J Am Coll Cardiol.* 2008 Oct 28;52(18):1435-41