

Q&A

by Mike Smith, PhD, MDSc



Many Americans are now taking statin drugs to lower plasma cholesterol levels. Most forms of these drugs have the unwanted side effect of inhibiting the synthesis of coenzyme Q10. This antioxidant has been shown critical for the treatment of Parkinson's and Cardiovascular Disease (CVD); stopping disease progressions. Here are some common but important questions I have fielded and their answers...

Statin drugs & CoEnzyme Q10

Q What is CoQ10 exactly?

A CoQ10 is a vitamin-like substance present in all human cells. It consists of two portions; the first portion is a very long, fatty acid or *polyisoprene* chain which is fat but not water soluble. This polyisoprene chain binds to cell membranes, which are primarily fatty acid and encase the mitochondria and lysosome organelles. The second is the quinone portion which undergoes rapid oxidation-reduction (food burning) reactions and is slightly water soluble. Quinone also gives CoQ10 the yellow-orange coloration. The quinone portion binds with Krebs cycle enzymes to funnel energy from fats and sugars to synthesize ATP, UTP, GTP, NADH, NADPH in the mitochondria.

Q Where do we obtain CoQ10 in our diets?

A Primarily from meats; heart and kidney are the best sources. Fruits and vegetables provide only minuscule amounts of this nutrient. Children can biosynthesize some CoQ10 and gradually we lose our ability to biosynthesize CoQ10 with age.

Q Why supplement with CoQ10?

A As we age and lose our ability to synthesize CoQ10, we become deficient if additional CoQ10 is not supplied. Deficiency in CoQ10 can be serious, especially to the heart, which requires CoQ10 for energy.

Q How does the action of statin drugs interfere with CoQ10?

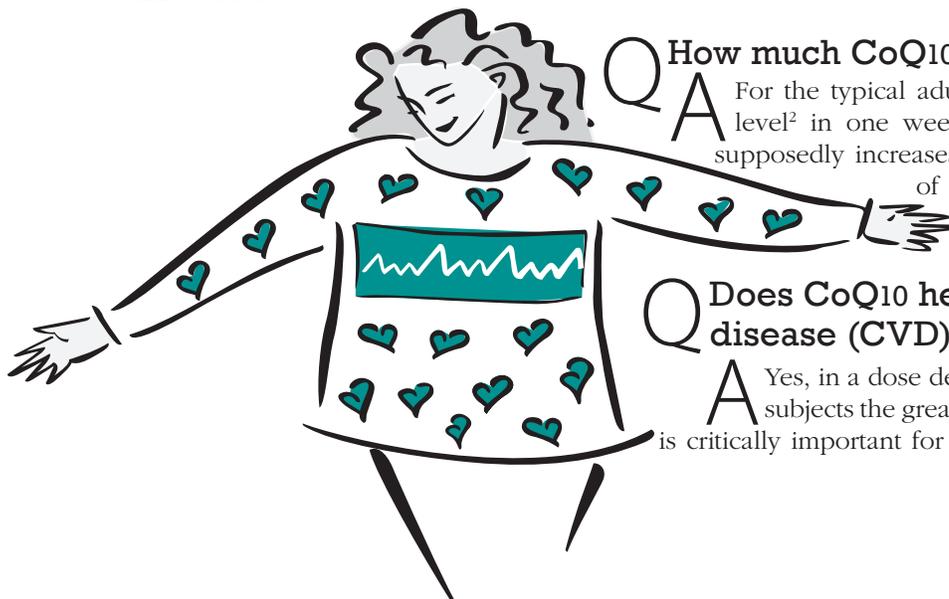
A These drugs compete with the building block of cholesterol at the active site of one of the enzymes biosynthesizing cholesterol. Statin drugs—and there are several varieties of this drug—do successfully lower cholesterol levels in the human bloodstream. However, it turns out that this very building block is also critical for the biosynthesis of CoQ10 and CoQ10 cannot be synthesized without it. Humans exhibit a significant decline in CoQ10 plasma levels when on statin drugs and in a dose-dependent manner¹. And I do mean *significant*².

Q How much CoQ10 to take?

A For the typical adult, 100 mg/day will double your plasma level² in one week. If you take 200 mg/day your CoQ10 supposedly increases six-fold, although I am a bit suspicious of this latter claim³. Older folks need more than younger people.

Q Does CoQ10 help with cardio-vascular disease (CVD)?

A Yes, in a dose dependent manner⁴. The more CoQ10 given subjects the greater the rate of clinical improvement. CoQ10 is critically important for the proper function of the mitochondria.



Continued

Statin drugs & CoEnzyme Q10

continued

These are organelles which create ATP, NADH and the other key high energy chemicals from foodstuffs, such as sugars and fats. Without ATP, NADH etc. (energy), your cells cannot maintain integrity and they die. In fact, the act of organized cell death, called *apoptosis*, is orchestrated by having the cell's mitochondria shut down. Once all ATP and NADH have been depleted, the cell dies. This is only good if the cell is a superfluous leukocyte or a cell becoming cancerous, which is why apoptosis is not a bad term.

Q So statin drugs might be deleterious to the mitochondria?

A There are reports that several types of statin drugs are toxic to rat skeletal muscle mitochondria⁵. Although statin drugs are usually well tolerated, myotoxicity (muscle toxic) is a major problem for some people taking statin drugs—these people feel muscle pain which is exacerbated by exercise⁶. These effects of statin drugs seem not to affect the heart; of course most patients live longer on statin drugs than off⁷. (The most effective behavioral change, however, is to quit smoking⁸.)

Q Which form of CoQ10 is the most bioavailable?

A The bioavailability via the human digestive tract is pretty good. Softgels do deliver slightly more to the bloodstream than hard gel capsules or tablets; the exact percent is dependent on the population selected and study location. CoQ10 absorption via the gut is best with fatty foods; another reason to cook with olive oil.

Q Are there other benefits from CoQ10?

A CoQ10 is also required by the lysosome organelle. This subcellular compartment digests the broken machinery of living cells so that small bits can be expelled into the bloodstream for excretion by the kidneys or recycling by the liver. Lysosome viability may be important in Alzheimer's and Parkinson's diseases.

Q How much CoQ10 to take for Parkinson's Disease?

A CoQ10 has been reported as efficacious treatment of Parkinson's at 300 and 600 mg/day, but 1200 mg/day worked best⁹. Thus, 1200 mg might be the upper limit of our recommended daily intake; with only trivial complaints reported by humans on that dose.

Q What about CoQ10 for fibromyalgia?

A Since deficiency in the number of mitochondria is a leading hypothetical for fibromyalgia, it would certainly be wise to take CoQ10, whether you're taking a statin drug or not.

References

1. Mortensen, SA, et al. (1997). Dose-related decrease of serum coenzyme Q10 during treatment with HMG-CoA reductase inhibitors. *Molecular Aspects of Medicine* 18 (Supplement): S137-144.
2. Crane, FL (2001). Biochemical functions of coenzyme Q10. *Journal of the American College of Nutrition* 20(6): 591-598. Fredrick Crane discovered CoQ10.
3. Kaikkonen, J, et al. (2002). Coenzyme Q10: absorption, antioxidative properties, determinants and plasma levels. *Free Radical Research* 36(4): 389-397.
4. Langsjoen, PH and Langsjoen AM (1999). Overview of the use of CoQ10 in cardiovascular disease. *Biofactors* 9(2-4): 273-284.
5. Kaufmann, P, et al. (2006). Toxicity of statins on rat skeletal muscle mitochondria. *Cell Mol. Life Sci.* 63: 2415-2425.
6. Sacher, J, et al. (2005). Delineation of myotoxicity induced by 3-hydroxy-3-methylglutaryl Co A reductase inhibitors in human skeletal muscle cells. *J. Pharmacol. Exper. Therap.* 314: 1032-1041.
7. Bavry, AA, et al. (2007). Long-term benefit of statin therapy initiated during hospitalization for an acute coronary syndrome: A systematic review of randomized trials. *Am. J. Cardiovasc. Drugs* 7: 135-141.
8. Franco, OH, et al. (2007). Primary prevention of cardiovascular disease: cost-effectiveness comparison. *Intern. J. Tech. Asses. Health Care* 23: 71-79.
9. Shults, CW, et al. (2002). Effects of Coenzyme Q10 in Early Parkinson Disease. *Archives of Neurology* 59: 1541-1550.

©2007-2008 TyH Publications & M.Smith

Dr. Smith pursued advanced studies in biochemistry, physiology and medicine and co-authored more than 30 scientific and medical articles in journals. He became interested in nutritional supplements after reading Linus Pauling and while doing research on oxygen and carbon monoxide toxicities. Dr. Smith is a member of TyH's Advisory Panel.

Published in *Health Points*. This article is protected by copyright and may not be reproduced without written permission. For information on a subscription, please call TyH Publications, 1-800-801-1406 or write TyH Publications, 17007 E. Colony Drive, Suite 107, Fountain Hills, AZ 85268. E-mail editor@e-tyh.com. For information on TyH products, visit our website at www.e-tyh.com.

CoQ10 is **critically important** for the proper function of the mitochondria. These are **organelles which create ATP, NADH** and the other key high energy chemicals from foodstuffs, such as sugars and fats. Without ATP, NADH etc. (energy), your cells **cannot maintain integrity and they die.**