



Coenzyme Q10 (CoQ10)



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What's the Bottom Line?

How much do we know about CoQ10?

We have some information from high quality studies done in people about the safety and effectiveness of CoQ10 for different conditions.

What do we know about the effectiveness of CoQ10?

CoQ10 supplements may benefit some patients with cardiovascular disorders, but research on other conditions is not conclusive.

What do we know about the safety of CoQ10?

CoQ10 has mild side effects and is generally well tolerated. However, it may make warfarin, an anticoagulant (blood thinner), less effective.

What Is CoQ10 and Why Is It Important?

Coenzyme Q10 (CoQ10) is an antioxidant that is necessary for cells to function properly. It is found in plants, bacteria, animals, and people. Cells use CoQ10 to make the energy they need to grow and stay healthy. CoQ10 can be found in highest amounts in the heart, liver, kidneys, and pancreas. Levels of CoQ10 decrease as you age. A variety of diseases, including some genetic disorders, are associated with low levels of CoQ10. Fish, meats, and whole grains all have small amounts of CoQ10, but not enough to significantly boost the levels in your body.

What the Science Says About the Effectiveness of CoQ10

CoQ10 supplements may benefit some patients with cardiovascular disorders. Researchers have also looked at the effects of CoQ10 for drug-induced muscle weakness, reproductive disorders, cancer, and other diseases. However, results from these studies are limited and not conclusive.

The following information highlights the research status on CoQ10 for the conditions for which it has been studied.

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Heart Conditions

- For patients with heart failure, taking CoQ10 was associated with improved heart function and also feeling better, according to research reviews published in 2007 and 2009. A 2013 meta-analysis also found an association between taking CoQ10 and improved heart function.
- Taking a combination of nutrients including CoQ10 was associated with quicker recovery after bypass and heart valve surgeries, according to a 2011 randomized controlled trial of 117 patients.
- For people with high blood pressure, the results of taking CoQ10 supplements have been mixed.
 - Some studies suggest that CoQ10 is associated with blood pressure control, but the findings are limited, a 2009 systematic review showed.
 - CoQ10 does not reduce high blood pressure or heart rate in patients with metabolic syndrome (a group of conditions that put you at risk for heart disease and diabetes), a small, randomized clinical trial reported in 2012.

Muscle Weakness From Statins (Cholesterol-lowering Drugs)

- A 2010 review described research showing that CoQ10 may help ease the myopathy (muscle weakness) sometimes associated with taking statins. However, the findings are not definite, the review concluded.
- A 2012 clinical trial of 76 patients who developed muscle pain within 60 days of starting statins found that CoQ10 was no better for pain than a placebo.

Reproductive Disorders

There is evidence that CoQ10 may improve semen quality and sperm count in infertile men, a 2010 review noted. However, it is uncertain whether this improvement affects the likelihood of conception.

Cancer

There is no convincing evidence that CoQ10 prevents or treats cancer, but two large studies from 2010 and 2011 found that women who developed breast cancer were more likely than others to have abnormal CoQ10 levels, either very low or unusually high.

Other Research on CoQ10

Studies have examined CoQ10 for **amyotrophic lateral sclerosis** (ALS, also known as Lou Gehrig's disease), **Down syndrome, diabetes, Huntington's disease, migraines, Parkinson's disease, neuromuscular diseases**, and age-related changes in cells and genes. The research on CoQ10 for these conditions is limited, so we can't draw conclusions about its effectiveness.

What the Science Says About the Safety and Side Effects of CoQ10

- Studies have not reported serious side effects related to CoQ10 use.
- The most common side effects of CoQ10 include insomnia, increased liver enzymes, rashes, nausea, upper abdominal pain, dizziness, sensitivity to light, irritability, headaches, heartburn, and fatigue.
- CoQ10 should not be used by women who are pregnant or breastfeeding.

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- Statins may lower the levels of CoQ10 in the blood. However, it is unclear what type of health effect this may have on an individual.
- CoQ10 may make warfarin, an anticoagulant (blood thinner), less effective.

National Institutes of Health (NIH)-Funded Research

NIH is currently sponsoring studies investigating the effects of CoQ10 on mild-to-moderate muscle pain in people who take statins, fertility in older women, and breast cancer treatments.

More to Consider

- Do not use CoQ10 supplements to replace a healthful diet or conventional medical care, or as a reason to postpone seeing a health care provider about a medical problem.
- If you're thinking about using a dietary supplement, first get information on it from reliable sources. Keep in mind that dietary supplements may interact with medications or other supplements and may contain ingredients not listed on the label. Your health care provider can advise you.
- If you're pregnant or nursing a child, or if you're considering giving a child a dietary supplement, it is especially important to consult your (or your child's) health care provider.
- Look for published research studies on CoQ10 for the health condition that interests you.
- Tell all your health care providers about any complementary or integrative health approaches you use. Give them a full picture of what you do to manage your health. This will help ensure coordinated and safe care.

For More Information

NCCIH Clearinghouse

The NCCIH Clearinghouse provides information on NCCIH and complementary and integrative health approaches, including publications and searches of Federal databases of scientific and medical literature. The Clearinghouse does not provide medical advice, treatment recommendations, or referrals to practitioners.

Toll-free in the U.S.: 1-888-644-6226

TTY (for deaf and hard-of-hearing callers): 1-866-464-3615

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Web site: www.ncbi.nlm.nih.gov/pubmed

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NIH Clinical Research Trials and You

NIH has created a Web site, NIH Clinical Research Trials and You, to help people learn about clinical trials, why they matter, and how to participate. The site includes questions and answers about clinical trials, guidance on how to find clinical trials through ClinicalTrials.gov and other resources, and stories about the personal experiences of clinical trial participants. Clinical trials are necessary to find better ways to prevent, diagnose, and treat diseases.

Web site: www.nih.gov/health/clinicaltrials/

Research Portfolio Online Reporting Tools Expenditures & Results (RePORTER)

RePORTER is a database of information on federally funded scientific and medical research projects being conducted at research institutions.

Web site: projectreporter.nih.gov/reporter.cfm

MedlinePlus

To provide resources that help answer health questions, MedlinePlus (a service of NLM) brings together authoritative information from NIH as well as other Government agencies and health-related organizations.

Web site: www.nlm.nih.gov/medlineplus/

Key References

- Bookstaver DA, Burkhalter NA, Hatzigeorgiou C. Effect of coenzyme Q10 supplementation on statin-induced myalgias. *American Journal of Cardiology*. 2012;110(4):526-529.
- Chai W, Cooney RV, Franke AA, et al. Plasma coenzyme Q10 levels and postmenopausal breast cancer risk: the multiethnic cohort study. *Cancer Epidemiology, Biomarkers & Prevention*. 2010;19(9):2351-2356.
- Hidaka T, Fujii K, Funahashi I, et al. Safety assessment of coenzyme Q10 (CoQ10). *BioFactors*. 2008; 32(1-4):199-208.
- Ho MJ, Bellusci A, Wright JM. Blood pressure lowering efficacy of coenzyme Q10 for primary hypertension. *Cochrane Database of Systematic Reviews*. 2009;(4):CD007435. Accessed at www.cochranelibrary.com on December 31, 2013.
- Kumar A, Kaur H, Devi P, et al. Role of coenzyme Q10 (CoQ10) in cardiac disease, hypertension and Meniere-like syndrome. *Pharmacology & Therapeutics*. 2009;124(3):259-268.
- Littarru GP, Tiano L. [Clinical aspects of coenzyme Q10: an update](#). *Nutrition*. 2010;26(3):250-254.
- Mancuso M, Orsucci D, Volpi L, et al. Coenzyme Q10 in neuromuscular and neurodegenerative disorders. *Current Drug Targets*. 2010;11(1):111-121.
- Singh U, Devaraj S, Jialal I. Coenzyme Q10 supplementation and heart failure. *Nutrition Reviews*. 2007; 65(6 Pt 1):286-293.
- Spindler M, Beal MF, Henchcliffe C. Coenzyme Q10 effects in neurodegenerative disease. *Neuropsychiatric Disease and Treatment*. 2009;5:597-610.
- Tiano L, Busciglio J. Mitochondrial dysfunction and Down's syndrome: is there a role for coenzyme Q(10)? *BioFactors*. 2011;37(5):386-392.

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