

CoQ10 May Help AFib, NAFLD and Other Chronic Diseases

Analysis by [Dr. Joseph Mercola](#)

✓ Fact Checked

STORY AT-A-GLANCE

- › CoQ10 is the third-most consumed supplement, after fish oil and multivitamins
- › CoQ10 keeps your mitochondria healthy and plays a crucial role in the production of ATP, the cellular energy required to keep you alive
- › CoQ10 deficiencies have been linked to many health problems, including migraines, heart disease and cancer
- › Conversely, supplementing with CoQ10, or the natural form called ubiquinol, may help improve several chronic health conditions such as AFib, NAFLD and heart failure

This article was previously published October 22, 2020, and has been updated with new information.

Coenzyme Q10 (CoQ10) is the third-most consumed supplement,¹ yet many people don't realize how clinically effective it really is.

Although it's not approved by the U.S. Food and Drug Administration as a treatment or preventative drug, several new studies show that taking CoQ10 supplements may help address several chronic health conditions, including atrial fibrillation (AFib), nonalcoholic fatty liver disease (NAFLD), insulin resistance, heart failure, cancer and migraines, to name a few.

Ubiquinol – the reduced, electron-rich form of CoQ10 that your body produces naturally – plays an important role in the electron transport chain of your mitochondria, where it

facilitates the conversion of energy substrates and oxygen into the biological energy (adenosine triphosphate or ATP) needed by your cells for life, repair and regeneration.

It's a fat-soluble antioxidant, meaning it works in the fat portions of your body, such as your cell membranes, where it mops up potentially harmful byproducts of metabolism known as reactive oxygen species (ROS). As such, ubiquinol and CoQ10 supplements help protect your mitochondrial membranes from oxidative damage, and this in turn has been shown to be helpful for a number of health conditions and chronic diseases.

Why CoQ10 Is so Important

Many conditions, including heart disease and migraines – for which CoQ10 has been found beneficial – appear to be rooted in mitochondrial dysfunction.² CoQ10 is used by every cell in your body, but especially your heart cells.

Cardiac muscle cells have about 5,000 mitochondria per cell, while liver cells have 1,000 to 2,000 mitochondria each.³ As another reference, mitochondria make up about 35% of the volume of cardiac tissue and only 3% to 8% of the volume of skeletal muscle tissue.⁴

About 90% or more of the ROS in your body are made by your mitochondria.⁵ Using the analogy of the mitochondria as an engine, the combustion (metabolism) that takes place in there creates exhaust fumes – damaging byproducts when produced in excessive amounts.

One of the functions of CoQ10, or ubiquinol, is to neutralize those byproducts.⁶ When ubiquinol is lacking, the byproducts remain and begin to damage the cell. Ubiquinol is particularly beneficial for your heart health. C-reactive protein (CRP) is a marker for inflammation, and when your CRP is elevated, it suggests you have a heightened risk for heart disease.⁷

Two other markers for inflammation are gamma-glutamyl transferase (GGT),⁸ which is an early marker of heart failure, and N-terminal pro b-type natriuretic peptide (NT-proBNP).⁹

There's an association between the levels of these two markers and ubiquinol as well. When ubiquinol is supplemented, both these markers go down and genes associated with them are downregulated.

Low CoQ10 levels have also been detected in people with certain types of cancer,¹⁰ including lung, breast and pancreatic cancer, as well as melanoma metastasis, further strengthening the metabolic theory of cancer. The word "coenzyme" also provides a clue to its importance; it works synergistically with other enzymes to digest food, for example.

It also has the ability to increase your body's absorption of important nutrients. More specifically, it helps recycle vitamins C and E,^{11,12} thereby maximizing their beneficial effects.

CoQ10 Can Help Improve Atrial Fibrillation (AFib)

AFib is an abnormal, often rapid, heart rhythm that occurs when the atria, your heart's upper chambers, beat out of sync with the ventricles, the heart's lower chambers. It's a common symptom in those with heart failure or heart disease but can also occur on its own.

Oxidative stress and increased ROS can play a role in the development of AFib. Conversely, scavenging of ROS and a reduction in oxidative stress have been shown to be an essential part of keeping the heart functioning normally.¹³

In one study, 102 patients with AFib were divided into two groups. One group was given a CoQ10 supplement while the other group was given a placebo. After 12 months of supplementation, 12 people in the placebo group had AFib episodes compared to only three people in the CoQ10 group.¹⁴

CoQ10 Can Stop the Progression of NAFLD

NAFLD is the most common cause of chronic liver disease around the world, with a prevalence of 25%.¹⁵ Obesity and insulin resistance increase your risk of NAFLD.

Mitochondrial dysfunction and oxidative stress, two hallmarks of CoQ10 deficiency, have also been shown to play a role,¹⁶ as has choline deficiency.

Currently, there are no approved medical treatments for NAFLD. Lifestyle changes, such as elimination of processed vegetable oils and processed carbs, remain the gold standard for managing NAFLD and, hopefully, preventing its progression. Since CoQ10 levels tend to be depleted in those with NAFLD, supplementation has been shown to help reduce oxidative stress and inflammation.¹⁷

In one study,¹⁸ 44 patients were divided into two groups. One group was given 100 mg of CoQ10 each day, while the other was given a placebo. After four weeks of supplementation, the group taking CoQ10 dropped weight and had lower levels of serum AST, a blood marker that indicates liver disease and/or damage.

CoQ10 May Be the Answer for Several Other Conditions

In addition to helping with AFib and NAFLD, CoQ10 may be the answer to correcting several other chronic health conditions, including the following:

High blood pressure — CoQ10 acts directly on your endothelium, dilating your blood vessels and lowering blood pressure.^{19,20} CoQ10 also decreases aldosterone, a hormone that makes you retain salt and water.^{21,22} When aldosterone goes down, excess salt and water are excreted through your kidneys, often causing your blood pressure to go down.

Dyslipidemia — In one study,²³ 101 participants with dyslipidemia were given 120 mg of Coq10 or a placebo every day for 24 weeks. Without taking any lipid-lower drugs, participants taking the CoQ10 had decreases in harmful LDL and triglycerides and increases in total antioxidant capacity.

Heart failure — CoQ10 deficiency is linked to poorer prognosis for those with heart failure.²⁴ Supplementing with CoQ10 can restore normal CoQ10 levels, helping to prevent heart cell damage and significantly improving heart failure.²⁵

Chronic kidney disease — Increased oxidative stress is a major factor in chronic kidney disease and related cases of cardiovascular disease.²⁶ Patients with chronic kidney disease tend to have decreased levels of CoQ10 in their blood. CoQ10 has been shown to improve mitochondrial function and decrease oxidative stress in chronic kidney disease patients, with and without dialysis.²⁷

Systemic inflammation — Studies^{28,29} show that supplementing with 60 mg to 500 mg of CoQ10 for eight to 12 weeks can significantly reduce tumor necrosis factor alpha (TNF- α), IL-6 and CRP; three measures of widespread inflammation.

Stroke — Systemic inflammation, oxidative stress and nerve cell damage play a role in the development of stroke. Studies³⁰ show that supplementing with CoQ10 can reduce ischemic lesions and improve outcomes in patients who have been treated with a statin after having a stroke (statins reduce CoQ10 levels in your body).

Migraine — CoQ10 deficiency is a common underlying factor of idiopathic migraines. Supplementing with CoQ10 can help reduce frequency and severity of migraines and alleviate associated symptoms such as nausea and sensitivity to light.³¹

Polycystic ovary syndrome (PCOS) — In one study,³² 86 women with PCOS were given CoQ10 alone, CoQ10 with vitamin E, vitamin alone or a placebo. After eight weeks, the group taking CoQ10 alone had improved levels of sex hormones (lower levels of testosterone and luteinizing hormone) and improved insulin resistance.

Cancer — In one study,³³ two women with breast cancer were given fatty acids, antioxidants and 300 mg to 390 mg of CoQ10. After two to three months, mammograms showed no tumors or residual tumor tissue, indicating cancer regression. A review³⁴ in the Journal of Clinical Oncology that looked at how CoQ10 affected cancer treatment found it may help protect the heart and liver from toxicity during treatment.

Insulin resistance — CoQ10 levels are lower in mitochondria in insulin-resistant tissues.³⁵ In one study,³⁶ daily intake of 100 mg of CoQ10 improved insulin resistance

and serum insulin levels in patients with markers of metabolic syndrome.

CoQ10 Versus Ubiquinol

As mentioned, ubiquinol is the reduced version of CoQ10 (aka ubiquinone). They're actually the same molecule, but when CoQ10 is reduced it takes on two electrons, which turns it into ubiquinol. In your body, this conversion occurs thousands of times every second inside your mitochondria.

The flipping back and forth between these two molecular forms is part of the process that transforms food into energy. Ubiquinol production ramps up from early childhood until your mid- to late 20s. By the time you hit 30, it begins to decline.³⁷ Young people are able to use CoQ10 supplements quite well, but older people do better with ubiquinol, as it's more readily absorbed.

How to Supplement With Ubiquinol

Your body can naturally make CoQ10, but genetic alterations in metabolism, poor diet, oxidative stress, chronic conditions and aging can all interfere with CoQ10 production and lead to CoQ10 deficiency. Statin drugs can also deplete CoQ10.

To maintain good health, an adult body should contain 0.5 to 1.5 g of CoQ10³⁸ and sometimes it takes a supplement to keep you there. Dosing requirements will vary depending on your individual situation and needs.

As a general rule, the sicker you are, the more you need. The suggested dose is usually between 30 mg to 100 mg per day if you're healthy, or 60 to 1,200 mg daily if you're sick or have underlying health conditions.³⁹

If you have an active lifestyle, exercise a lot or are under a lot of stress, you may want to increase your dose to 200 to 300 mg per day. Importantly, if you're on a statin drug, you need at least 100 mg to 200 mg of ubiquinol or CoQ10 per day, or more. Ideally, you'll want to work with your physician to determine your ideal dose.

Sources and References

- ^{1, 38, 39} [Comprehensive Reviews in Food Science and Safety. 2020;19\(2\):574-594](#)
- ² [Integr Med \(Encinitas\). 2014;13\(4\):35-43](#)
- ³ [PeerJ. 2018;6:e4790](#)
- ⁴ [Am J Physiol Heart Circ Physiol. 2014;307\(3\):H346-52](#)
- ⁵ [Nat Commun. 2019;10\(1\):1704](#)
- ⁶ [Redox Rep. 2018;23\(1\):136-145](#)
- ⁷ [Clinics. 2016;71\(4\):235-42](#)
- ⁸ [Nutr Metab. 2016;13:37](#)
- ⁹ [Clin Res Cardiol. 2010;99\(7\):445-52](#)
- ¹⁰ [PDQ Cancer Information Summaries. 2020](#)
- ¹¹ [Nutrition and Dietary Supplements. 2018;10:1-11](#)
- ¹² [Subcell Biochem. 1998;30:491-507](#)
- ^{13, 24, 26, 35} [Antioxidants \(Basel\). 2020;9\(4\)](#)
- ¹⁴ [J Investig Med. 2015;63\(5\):735-9](#)
- ¹⁵ [Gastroenterology. 2020;158\(7\):1851-1864](#)
- ^{16, 17} [Journal of Prescribing Practice. 2020;2\(4\)](#)
- ¹⁸ [Arch Med Res. 2014;45\(7\):589-95](#)
- ¹⁹ [Molecular Aspects of Medicine. 1994;15\(1\):s257-s263](#)
- ²⁰ [Circ Res. 1989;65\(1\):1-21](#)
- ²¹ [Am J Physiol. 1965;208:1275-80](#)
- ²² [Molecular Aspects of Medicine. 1994;15\(1\):s265-s272](#)
- ²³ [J Clin Lipidol. 2018;12\(2\):417-427.e5](#)
- ²⁵ [Clin Investig. 1993;71\(8 Suppl\):S134-6](#)
- ²⁷ [BMJ Open. 2019;9\(5\):e029053](#)
- ²⁸ [Pharmacol Res. 2017;119:128-136](#)
- ²⁹ [Pharmacol Res. 2019;148:104290](#)
- ³⁰ [Nutr Neurosci. 2019;22\(4\):264-272](#)
- ³¹ [Headache. 2011;51\(3\):469-483](#)
- ³² [Arch Med Res. 2019;50\(2\):1-10](#)
- ³³ [Biochem Biophys Res Commun. 1994;199\(3\):1504-8](#)
- ³⁴ [J Clin Oncol. 2004;22\(21\):4418-24](#)
- ³⁶ [Eur J Nutr. 2016;55\(8\):2357-2364](#)
- ³⁷ [Biofactors](#)