

Scientific Name: Coenzyme Q-10

Other Names: Co Q 10, Ubiquinol, Q 10, Ubidecarenone, Ubiquinone, Vitamin Q

Who is this for?

Uses

Coenzyme Q-10 is used extensively in Japan, and its use is more common in Europe and western Asia than it is in the United States. However, specific coenzyme Q-10 products have been given orphan drug status in the United States. An orphan drug has received FDA approval because it shows effectiveness for treating severe or rare diseases that usually have few other treatment options. In the United States, designated coenzyme Q-10 products are used to treat Huntington's disease, childhood heart failure, and rare, inherited defects in mitochondria, which are tiny structures within body cells. Huntington's disease (also called Huntington's chorea) is an hereditary condition that involves increasing loss of muscle control and decreasing mental function. Generally not apparent until adulthood, Huntington's disease may be passed to children before parents realize they have it. Because mitochondria are responsible for energy production by each cell, many of them are found in cells that use lots of energy – such as muscle cells. Cells that use little energy have few mitochondria. If the mitochondria do not function properly, progressively worsening symptoms that may include muscle weakness, nerve damage, seizures, stroke-like episodes, and eventually death may result. Although coenzyme Q-10 seems to be an effective treatment to prevent, delay, or decrease the symptoms of inherited mitochondrial defects in some individuals, it may take 6 months or longer to produce a noticeable response.

In other countries, coenzyme Q-10 is used widely to treat heart conditions – particularly heart failure (HF), but also angina, heart rhythm disorders, and high blood pressure. Heart failure was formerly called congestive heart failure (CHF). In Japan, coenzyme Q-10 has been prescribed for treating HF since 1974. In several published studies of individuals with HF, taking coenzyme Q-10 has generally reduced symptoms such as shortness of breath, sleep problems, and swelling that are associated with HF. It is believed that coenzyme Q-10 may increase energy production in the heart muscle, which may cause the heart to beat with more force. However, results from other human studies contradict these findings, with little or no improvement seen in the actual pumping action of the heart or in the individual's ability to perform everyday tasks. The best overall results occurred for individuals who took coenzyme Q-10 along with other prescription drugs for HF. Even though coenzyme Q-10 may not affect heart function, it does appear to promote relaxation in both arteries and veins. Therefore, taking it may help relieve angina and reduce high blood pressure. It cannot replace prescription medications, however, and it may interfere with medications that your doctor prescribes. Before taking coenzyme Q-10 for HF or any serious condition, talk to your health care provider.

Based on results from several studies, coenzyme Q-10 appears to be safe for treating heart diseases in individuals with diabetes; but whether it affects blood sugar levels is not known conclusively. Results from some studies may show a slight decrease in blood sugar levels when coenzyme Q-10 is taken by individuals with diabetes, but other studies have found no effects on insulin production or utilization. Coenzyme Q-10 may be slightly effective for individuals with an inherited type of diabetes known as maternally inherited diabetes mellitus and deafness (MIDD).

Low levels of natural coenzyme Q-10 have been observed in individuals with muscle-wasting diseases (conditions that result in decreased muscle size and efficiency). Therefore, coenzyme Q-10 is being studied as a possible treatment for conditions, such as Parkinson's disease (PD), that affect muscle function. Coenzyme Q-10's possible energy-enhancing effects may prevent the deterioration of muscle activity. Additionally, in animal and human studies, increasing amounts of coenzyme Q-10 also seemed to increase levels of a neurotransmitter known as dopamine. Neurotransmitters are chemicals that carry messages from nerve cells to other cells. Individuals with PD generally have low dopamine in levels, so raising dopamine may relieve their PD symptoms. Additionally, coenzyme Q-10 may reduce other factors, such as inflammation and damage by oxygen free radicals, that may cause or worsen PD. Studies are less conclusive, however, for coenzyme Q-10's possible effectiveness for other muscle-wasting conditions such as Huntington's disease and muscular dystrophy. While these and similar conditions may have a connection to low coenzyme Q-10 levels, it is not known if the lowered levels of coenzyme Q-10 are a cause or a result of the conditions. Much more research is needed in these areas.

As an antioxidant, coenzyme Q-10 may also have potential as an anticancer and immune-stimulating agent. Antioxidants are thought to protect body cells from damage caused by a chemical process called oxidation. Oxygen free radicals, natural chemicals that may also suppress immune function, are produced during oxidation. In one study, coenzyme Q-10 levels were found to be low in women who have cancer of the cervix or who have conditions that may lead to cervical cancer. As shown in case reports of women with breast cancer, supplementing prescription cancer treatments with coenzyme Q-10 may have helped to slow or stop the cancer from growing. In some cases, the spread of cancer to other parts of the body appeared to be prevented. Separate studies of people living with AIDS, may show

that the numbers of certain white blood cells reached levels that are more normal when coenzyme Q-10 was taken. In general, white blood cells, especially the kind known as T cells, are responsible for attacking abnormal substances – such as cancer cells. This apparent strengthening of the immune system may help prevent and treat AIDS and other infectious diseases. The antioxidant effects of coenzyme Q-10 may also protect the liver from some of the damage caused by certain drugs or chemicals or by chronic alcohol abuse. Some additional evidence from recent studies may also show that coenzyme Q-10 has potential to prevent or lessen the severity of migraine headaches. All these possible effects need further study to prove or disprove them.

Coenzyme Q-10 has also been used, both topically and orally, to treat periodontal (gum) disease. Increasing levels of coenzyme Q-10, which are usually low in individuals with gum disease, appeared to improve symptoms such as looseness and inflammation of the teeth in small studies of individuals with gum disease related to low coenzyme Q-10 levels. These studies were conducted nearly 30 years ago, though, and more recent research has failed to show a definite effect on periodontal disease from coenzyme Q-10 supplementation.

When should I be careful taking it?

Individuals with diabetes should avoid using large amounts of coenzyme Q-10 because it can lower blood sugar levels, potentially resulting in hypoglycemia (blood sugar that is too low). Symptoms of low blood sugar include shakiness, sweating, confusion, distorted speech, and loss of muscle control. If not corrected, low blood sugar can lead to unconsciousness and even death.

Precautions

Results from a recent small study done in Italy suggest that coenzyme Q-10 may pass from a mother to her infant in breast milk, but not in blood before birth. Very little other information is available on how coenzyme Q-10 might affect a developing fetus, an infant, or a small child. Therefore, its use is not recommended during pregnancy, while breast-feeding, or during early childhood.

What side effects should I watch for?

No serious side effects have been associated with taking coenzyme Q-10, although some individuals have reported minor gastrointestinal disturbances such as diarrhea, indigestion, and nausea while taking it.

What interactions should I watch for?

Prescription Drugs

Due to its possible blood sugar-lowering effects, coenzyme Q-10 may interfere with insulin and oral drugs for diabetes, such as:

- Actos
- Amaryl
- Avandia
- glipizide (Glucotrol XL)
- glyburide (Glynase)
- Glyset
- metformin (Glucophage)
- Prandin
- Precose

Due to its potential ability to lower blood pressure, coenzyme Q-10 may increase the effects of drugs that also lower blood pressure. Some blood pressure-lowering drugs are:

- ACE inhibitors such as captopril, enalapril, lisinopril, and Monopril
- Beta blockers such as atenolol, metoprolol, and propranolol
- Calcium channel blockers such as nifedipine, Norvasc, and verapamil
- Diuretics such as Dyazide, furosemide, and hydrochlorothiazide

Because coenzyme Q-10 is similar in structure to vitamin K, which increases the blood's ability to clot, coenzyme Q-10 may interfere with anti-clotting medications such as warfarin or heparin.

Coenzyme Q-10 may increase the effects of dopamine, so taking it may also increase the effectiveness of drugs that increase dopamine. Dopamine-enhancing drugs often are used to treat Parkinson's disease. They include:

- bromocriptine (Parlodel)
- cabergoline (Dostinex)

- levodopa (Dopar, Sinemet)
- pergolide (Permax)
- pramipexole (Mirapex)
- ropinirole (Requip)

Taking certain cholesterol-lowering drugs known as HMG Co-A reductase inhibitors or statins, seems to lower coenzyme Q-10 levels in the body. The consequences of this effect are not completely understood, but this interaction may account in part for severe muscle deterioration that is rarely associated with taking statins. Statins thought to affect coenzyme Q-10 include:

- lovastatin (Mevacor)
- pravastatin (Pravachol)
- Zocor

Propranolol (Inderal), a drug often used to treat hypertension, and doxorubicin (Adriamycin, Doxil, Rubex), an anticancer drug; may also limit or block the energy-producing activity of coenzyme Q-10.

Herbal Products

Because coenzyme Q-10 may decrease blood sugar levels, taking it with other blood sugar-lowering herbal products may result in hypoglycemia -- blood sugar that is too low. Herbs that may reduce blood sugar include:

- Eleuthero
- Fenugreek
- Ginger (in high amounts)
- Kudzu
- Panax Ginseng

Some interactions between herbal products and medications can be more severe than others. The best way for you to avoid harmful interactions is to tell your doctor and/or pharmacist what medications you are currently taking, including any over-the-counter products, vitamins, and herbs. For specific information on how coenzyme Q-10 interacts with drugs, other herbs, and foods and the severity of those interactions, please use our [Drug Interactions Checker](#) to check for possible interactions.

Should I take it?

Coenzyme Q-10 is a natural body chemical that was identified in the late 1950s. Small amounts of it are obtained from eating meat and seafood, but the majority of the body's supply is made within the body. Although nearly all body cells make it, coenzyme Q-10 concentrates in the muscles and in the heart, kidneys, liver, and pancreas. About half of the body's stores of coenzyme Q-10 are found in the mitochondria of the cells. Mitochondria are parts of body cells that convert dietary carbohydrates into energy. While coenzyme Q-10 is involved in strengthening body membranes, its main function is to carry electrons that are needed in the energy generation process. Various types of coenzyme Q are found in most living organisms, including bacteria, but only humans produce coenzyme Q-10 naturally. Commercial coenzyme Q-10 supplements are made by a fermentation process that includes beets, sugar cane, and specific yeasts.

Normal production of coenzyme Q-10 by humans is highest at about 20 years of age and then it declines gradually. Deficiencies of coenzyme Q-10 are rare, but they result in serious symptoms that include fatigue, muscle weakness, and seizures. Smoking cigarettes reduces the amounts of coenzyme Q-10 in the body, and taking certain drugs such as doxorubicin, some beta-blockers, or certain statins may also lower coenzyme Q-10 levels. Low levels of coenzyme Q-10 are associated with conditions ranging from AIDS and some cancers to periodontal disease. Generally, the extent of coenzyme Q-10 deficiency seems to correlate to the severity of the condition. That is, conditions affected by coenzyme Q-10 levels seem to worsen as coenzyme Q-10 decreases.

Athletes sometimes take supplemental coenzyme Q-10 in the belief that it may increase their ability to perform extended exercise, but study evidence has failed to support this belief.

Dosage and Administration

Coenzyme Q-10 supplements are available in a number of oral dosage forms, including capsules and tablets made from dried, powdered coenzyme Q-10. However, only a small percentage of oral coenzyme Q-10 supplements are thought to be absorbed from the intestines, with large percentages eliminated in the bile. Because coenzyme Q-10 dissolves in fats, soft gelatin capsules that contain coenzyme Q-10 in soy bean oil may be absorbed more easily and more completely than dried, powdered forms of coenzyme Q-10 by the body. Taking coenzyme Q-10 with a meal that includes fats may increase its absorption, as well. For topical application, usually a soft gelatin capsule of coenzyme Q-10 is opened and the contents applied to the gums with a cotton swab.

Oral dosage recommendations for coenzyme Q-10 supplementation range from 100 mg per day to 3,000 mg (0.1 gram to 3 grams) per day or more, depending on the condition being treated. For HF, a common oral dose is 100 mg per day, taken as two or three doses. If you decide to take coenzyme Q-10, follow the directions on the package that you purchase.

Summary

Coenzyme Q-10 is a natural body chemical that is essential for the production of energy by cells. Low levels of it have been associated with a number of diseases. Coenzyme Q-10 supplementation is used to treat genetic coenzyme Q-10 deficiencies, heart conditions, and periodontal disease. It may be useful in delaying the progression of Parkinson's disease and other conditions that affect muscle function. Its antioxidant and immune stimulating effects may give it anti-AIDS, anticancer, and liver protectant properties.

Risks

Blood sugar levels may be lowered by taking coenzyme Q-10, so individuals with diabetes may want to avoid it. Not enough is known about its possible effects to recommend coenzyme Q-10 supplementation for pregnant or breast-feeding women.

Side Effects

Mild occasional gastrointestinal disturbances are the only side effects that have been reported from taking coenzyme Q-10.

Interactions

The risk of low blood sugar may increase if coenzyme Q-10 is taken with drugs or herbals that treat diabetes. Coenzyme Q-10 may increase the effects of drugs that lower blood pressure. Because it may increase amounts of dopamine in the body, coenzyme Q-10 may increase the effectiveness of drugs that raise dopamine levels. Doxorubicin, propranolol, and some statins may decrease body levels of coenzyme Q-10.

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