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COENZYME Q_{10} FOR ATHLETES

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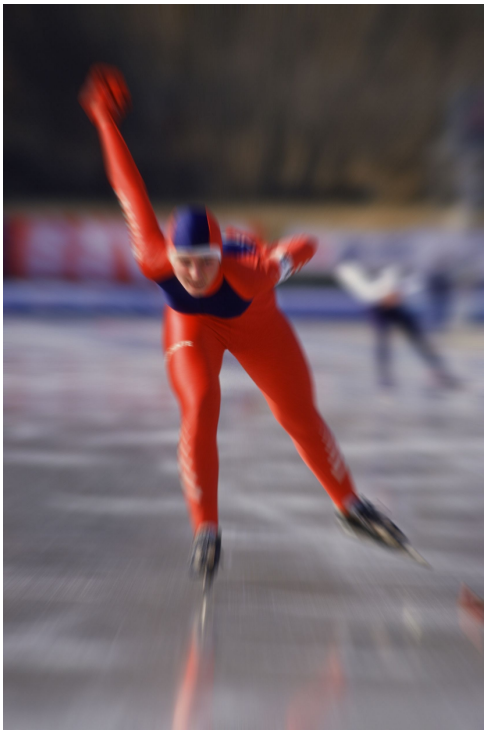
A study appearing in the *British Journal of Nutrition* (2008, 100: 903-9097) looked at coenzyme Q_{10} supplementation and muscle damage after intense exercise. This was a double-blind, placebo controlled study involving 18 athletes who were given either 300 mg of CoQ_{10} or a placebo for 20 days. During the course of the study they exercised intensely for 5 1/2 hours each day for six days. Blood tests were taken to indicate the level of muscle damage (myoglobin, and creatine kinase). The muscle damage indicators increased in both groups, but were significantly lower in the group receiving the CoQ_{10}.



Another double-blind, placebo-controlled study, appearing in the *Journal of the International Society of Sports Nutrition* (2008; 5(1): 8) looked at CoQ_{10} supplementation and athletic performance. The participants of the study were 22 trained athletes and 19 untrained subjects. An hour before a series of exercise tests they were randomly given either a placebo or 200 mg of Coenzyme Q_{10}. Blood samples and muscle biopsies were taken before and after exercise. The subjects were then given either a placebo or 100 mg of Coenzyme Q_{10} twice each day for a period of two weeks. At the end of the period they performed the same exercises and were tested in the same way. A trend for increased time to exhaustion was observed following 2 weeks of CoQ_{10} supplementation.

MERCURY AMALGAMS

Mercury fillings have been around since around 1890. In the early 1900s, German chemist, Alfred Stock warned of mercury toxicity from the fillings. So the mercury fillings and the controversy surrounding them are not new. Mercury fillings contain 50 parts mercury, 35 parts silver and 10 parts tin, copper and zinc. In spite of the propensity of the dental profession to call amalgam fillings "silver", more than 50% of the material in them is mercury, which is toxic.

The American Dental Association has long held the position that amalgam fillings became inert after a few days and were therefore safe. Currently the ADA recognizes that there is some absorption from amalgam fillings, but still holds the position that amalgams are safe. The FDA recommends not placing mercury fillings in children under the age of six. The FDA has produced a lengthy report (posted on its website) that discusses the amount of mercury absorbed from fillings, the effects of mercury toxicity and methods of testing. The report cites a study performed at the University of Tubingen Health Clinic, involving 20,000 subjects with mercury fillings. On average the amount of mercury found in saliva was 11.6 mcg/L; however, gum chewing could triple that figure. Also, those subjects with multiple fillings tended to have higher levels. Some subjects had extremely high levels, with 1% having more than 200 mcg/L and 10% having more than 100 mcg/L.

According to research appearing in the *Journal of Dental Research* (1992;71 (AADR Abstracts);284/1424), polishing fillings increased the mercury released from the fillings. A filling with a surface area of 25 square millimeters released over 3x more mercury vapor after being polished.

A study appearing in the *Archives of Environmental Health* (May/June, 1996;51(3):234-241) evaluated the amount of mercury in blood, hair and breast milk in 30 Swedish women six weeks after giving birth. Researchers found that the amount of inorganic mercury in the blood and breast milk correlated with the number of mercury fillings. The exposure of infants to mercury from breast milk was found to be about half of the tolerable daily intake for adults, as recommended by the World Health Organization.

Research appearing in *Biological Trace Element Research* (1997;56:143-152) looked at mercury absorption from amalgams in pregnant sheep. Three ewes were given 12 mercury amalgams, containing radioactive mercury, while three other ewes (not given amalgam fillings) acted as controls. The lambs born of the ewes with the fillings had mercury (which was found primarily in the liver). Breast feeding provided the newborn lambs with additional mercury, found primarily in the kidney. It has long been noted that mercury crosses the placenta and into the fetus. Mercury also crosses into breast milk.

Cadavers were examined in research appearing in the *Journal of Prosthetic Dentistry* (1987;58

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(6):704-707) to find the relationship between the number of amalgam fillings and the presence of mercury in nerve tissue. The data showed a positive correlation between the number of fillings and the amount of mercury found in brain tissue. Clearly there is a relationship between mercury fillings and the absorption of mercury into the body. Also, the amount absorbed seems to vary between patients, but there is a correlation between the number of fillings and the amount of mercury absorbed. More of a concern is that mothers can pass the mercury on to the fetus.

COENZYME Q 10

Coenzyme Q_{10} is also known as ubiquinone. The letter Q refers to quinone, which is a chemical group derived from aromatic rings. The number 10 refers to the 10 isoprene ($CH_2=C(CH_3)CH=CH_2$) units attached to the molecule. CoQ_{10} is found in all mammalian cells (for that matter, all eukaryotic cells). It is found primarily in the mitochondria and is vital to the electron transport chain; in other words it is important for cellular energy. CoQ_{10} is found in high levels in cells that require a lot of energy, like the cells of the heart, liver and kidney. CoQ_{10} is fat-soluble and also acts as an antioxidant.

Because tissues that need to produce a lot of energy require a lot of CoQ_{10}, supplementation tends to benefit those with cardiac problems. A double-blind, placebo-controlled study appearing in the *European Heart Journal* (2006 November;27(22):2675-81) looked at 23 subjects with stable, chronic heart failure. The study had four phases. In the first phase the subjects were given 300 mg of CoQ10 per day. In phase two, they received the supplement and supervised exercise training. In the third phase they received a placebo and in the final phase they received exercise training along with the placebo. The researchers found that the CoQ_{10} supplementation improved the ability of cardiac arteries to dilate. It also improved the contractility of the left ventricle and generally improved the heart's functional capacity. The benefits of the supplementation were enhanced by exercise. This supports earlier studies. Coenzyme Q_{10} has been shown to be of value in patients with heart failure according to earlier research appearing in the journal *Biofactors* (2006; 25(1-4): 137-45) and the *European Heart Journal* (August 1, 2000).

Research appearing in *Clinical Investigator* (1993;71:S 145-S 149) showed that 54% patients receiving three months of coenzyme Q_{10} supplementation (between 50 and 150 milligrams per day) had improvements in at least three symptoms of heart failure. Large percentages of patients experienced improvements with 81% having less cyanosis, 76.9% with less edema, 54% having less shortness of breath, 62% having less arrhythmia and 73% having less vertigo. Also, the severity of symptoms correlate with low coenzyme Q_{10} levels, according to research that appeared in the *International Journal of Tissue Reactions* (1990;12(3):155-162).

The body is like a piano, and happiness is like music. It is needful to have the instrument in good order.

Beecher

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CHRONIC FATIGUE AND THE ADRENAL GLANDS

The adrenal glands are small glands located on top of the kidney. The adrenal glands produce hormones, like cortisol and epinephrine, that help control heart rate, blood pressure, the way the body uses food, the levels of minerals such as sodium and potassium in the blood, and other functions particularly involved in stress reactions.

Cortisol levels and 24-hour urinary free cortisol levels were tested in 72 normal controls and in 30 patients diagnosed with chronic fatigue syndrome (CFS). The research appeared in the *Journal of Clinical Endocrinology and Metabolism* (1991;73 (6):1224-1234). The patients with CFS had lower evening cortisol levels and lower free cortisol excretion (found in 24-hour urine test).

ACTH stands for Adrenocorticotropic hormone. It stimulates the adrenal cortex to secrete cortisol (a glucocorticoid). The study found that the CFS patients had higher concentrations of ACTH. They had an overall increased sensitivity to ACTH, but a reduced maximal response to the hormone. In general, CFS patients have lower levels of glucocorticoids (like cortisol) than healthy people.

The authors of the study feel that CFS patients may have an adrenal insufficiency, which makes the adrenal glands more sensitive to ACTH. The fact that the adrenal glands do not respond as well to high doses of ACTH may indicate that there may be some atrophy of the glands (perhaps due to overstimulation).

CRH is corticotropin-releasing hormone (CRH), originally named corticotropin-releasing factor (CRF), and also called corticoliberin, is a polypeptide hormone and neurotransmitter involved in the stress response. It stimulates the pituitary to make ACTH and it is inhibited by cortisol. In CFS patients, the adrenal insufficiency may be due to a deficiency of CRH.