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Recommendation to discontinue L-carnitine supplementation therapy:

A STUDY WAS PUBLISHED IN NATURE MEDICINE (APRIL 7, 2013) INDICATING THAT, IN NON-VEGETARIANS, CONSUMPTION OF L-CARNITINE CAN LEAD TO INCREASED LEVELS OF A SUBSTANCE CALLED TRIMETHYLAMINE N-OXIDE (TMAO) TO THE ARTERIES. A STUDY PUBLISHED IN 2011 EVALUATED 1876 PATIENTS WHO UNDERWENT ANGIOGRAPHY OF THE CORONARY ARTERIES. TMAO LEVELS PREDICTED THE PRESENCE OF ARTERIAL DISEASE INDEPENDENT OF TRADITIONAL RISK FACTORS AND MEDICATIONS. TMAO SUPPRESSES REVERSE CHOLESTEROL TRANSPORT AND CAN CAUSE INCREASED LEVELS OF WHITE BLOOD CELLS IN THE WALL OF THE ARTERY.

L-carnitine was recommended to you due to increased levels of lipo (a) which is known to cause heart attacks. L-carnitine, coupled with a statin, has been shown to reduce lipo(a) levels as much as 30%. L-carnitine also is required to transport fatty acids to mitochondria as a fuel source for a cell's energy. L-carnitine also acts as an anti-oxidant which is beneficial to the heart muscle and inside lining of the artery. L-carnitine also helps prevent osteoporosis. As you can see, there are many potential benefits from L-carnitine which is produced in our body naturally in relatively large amounts.

The recent study linking L-carnitine to potential harm via TMAO production was a shock to many of us. The production of TMAO from L-carnitine is dependent on the microbes contained in the intestines. If a person is a strict vegetarian, their 'normal intestinal flora' does not convert

L-carnitine to TMAO. Most people are omnivores (meat eaters) in which case it appears taking supplemental L-carnitine might be harmful. In fact, the authors of the paper propose it is the L-carnitine that causes the increased cardiovascular risk of eating red meat (8 Oz. steak contains ~ 180 mg of L-carnitine). We believe this story is much more complicated and includes other risks from meat such as the cholesterol, fat and heme content. We would purpose that perhaps L-carnitine contributes to this risk.

TMAO is an oxidant. Therefore, it would drive oxidative stress which we know increases arterial inflammation. We measure the 'gold-standard' test for overall oxidative stress - F2 isoprostane. We asked the investigator if they looked at this measurement in their study. We wonder, if an adjustment were made for F2 isoprostane, would TMAO still be a significant predictor? They did not measure it as they had no urine samples and did not want the expense of measuring it in the blood.

In light of the above information, we feel it is prudent at this time to recommend all of our patients on L-carnitine to stop it unless they are a strict vegetarian and have a normal F2 isoprostane level. This is obviously an evolving story and if our opinion changes, we will notify you promptly.

The two studies referenced can be found on our website at www.baledoneen.com for your review. Please contact us, if you have any questions.

Wishing you wellness!
Bale/Doneen Method