Alpha Lipoic Acid

Common Indications:

- Strong Antioxidant
- Reduces peripheral neuropathy by blocking glycation
- Improves insulin signaling and regulation of appetite
- Heavy metal detoxification
- Improved cholesterol balance via antioxidant and glucose regulation
- Reduces bone loss

General Comments:

Alpha-lipoic acid (ALA) is a type of naturally occurring organosulfur compound with two thiol functional groups. It is naturally occurring antioxidant[1-3] and plays a key role in mitochondrial function thus energy production. In the body ALA is converted into dihydro-lipoic acid (DHLA) which is the active form. DHLA increases intracellular glutathione by reducing cystine to cysteine and enhances cellular cysteine uptake.[4,5,6] DHLA is a unique antioxidant given its ability to quenching every known free radical that occurs in living tissue, including both fat and water-soluble tissues. It has unequalled potential as a highly effective therapeutic agent in clinical conditions associated with free radical damage such as Parkinson's disease, Alzheimer's disease and other neurodegenerative illnesses.

Benefits & Mechanism of Action:

Antioxidant

Alpha lipoic acid is a powerful antioxidant in all tissues of the body.[7,8] It functions as a cofactor with several enzymes in the production of energy and is able to recycle antioxidants such as vitamin C, vitamin E, glutathione, and coenzyme Q10.[9,10]

Peripheral neuropathy

A human study found that supplementation with alpha lipoic acid may reduce neuropathy associated with diabetes.[11]

Improves insulin signaling and regulation of appetite

Alpha lipoic acid increases glucose uptake into muscle cells and activates AMP-activated protein kinase (AMPK) which upregulates PGC-1 alpha.[12,13,14,15,16] This reduces insulin secretion,

improves fatty acid and glucose utilization in the cells and regulates cell growth.

Heavy metal detoxification

ALA reduces neurotoxic effects of exposure to mercury, and appears to have positive effects for cadmium toxicity, providing a protective effect for cadmium-induced cell dysfunction and membrane damage in hepatocytes.[17,18,19]

Cholesterol imbalances

Helps improve lipid profiles by decreasing oxidation of LDL cholesterol.[20,21]

Bone loss

May help mitigate bone loss in osteopenic postmenopausal women.[22]

Dose: 100-300mg, 2-3 times daily with food.

Higher doses of 600mg twice per day may be used for a short time but will enhance potential for low biotin levels.

Symptoms of Deficiency:

Since alpha lipoic acid is not an essential nutrient, no deficiency condition has been identified. A deficiency of LASY, the enzyme needed to produce ALA, may result in depletion of the antioxidant defense system, leading to increased inflammation, insulin resistance, and mitochondrial dysfunction. Animal studies have concluded that the absence of LA is incompatible with life.[23]

Cautions & Side Effects:

No side effects or toxicity have been reported with alpha lipoic acid.

Food Sources:

Organ meat and spinach are the best dietary sources of alpha-lipoic acid. Smaller amounts occur in the leaves of some plants and in potatoes, carrots, tomatoes, brussel sprouts, rice bran, yeast extract, and sweet potatoes.

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Antioxidant

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Peripheral neuropathy

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Insulin signaling & regulation of appetite

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Bone loss

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Symptoms of Deficiency

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