



HOLTORF MEDICAL GROUP, INC.

CENTER FOR HORMONE IMBALANCE, HYPOTHYROIDISM AND FATIGUE

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Mitochondrial Dysfunction in Chronic Fatigue Syndrome and Fibromyalgia

A number of studies have demonstrated that there is mitochondrial dysfunction in chronic fatigue syndrome and fibromyalgia patients. The mitochondria are the energy factories for the cells where sugar is burned and energy is produced in the form of ATP (adenosine-tri-phosphate). When the mitochondria are not working properly, the cells and tissues of the body are starved for energy. This abnormality may be the common endpoint for all the dysfunctions present in chronic fatigue syndrome and fibromyalgia. Not only does the reduced amounts of glucose being metabolized result in weight gain in most individuals, the reduced amount of aerobic energy production requires the body to rely on anaerobic metabolism, resulting in fatigue, muscle pain, poor concentration, gastrointestinal dysfunction, headaches and poor recovery from exercise (post exertional malaise). A Great Britain study demonstrated that 70 percent of chronic fatigue syndrome patients have ultrastructurally abnormal mitochondria. Mitochondria can be poisoned by numerous substances, including environmental toxins, pesticides, chronic bacterial, viral and fungal infections, neurotoxins and nutritional and hormone deficiencies.

Mitochondrial function can be boosted by removing the offending agent when it can be identified, such as infection, toxin or hormone deficiency and by supplementing with mitochondria nutritional support. There are a number of supplements and agents that can be effective. In order to achieve optimal results, one must both remove the offending agent and concurrently boost with mitochondria with nutritional support.