

Chronic Fatigue Syndrome and Electromedicine

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Chronic Fatigue Syndrome (CFS) is a condition that has become quite prevalent in the last 50 years. It is defined as a debilitating lack of vitality that includes symptoms lasting at least 6 months. These symptoms may include:

- Sore throat
- Muscle pain
- Tender lymph nodes
- Joint pain
- Interrupted sleep
- Unexplained persistent and relapsing fatigue that is not alleviated by rest
- Substantial reduction in previous levels of activity

More women are affected than men are by this syndrome. Even more disturbing, a muscle disorder that also causes weakness, called fibromyalgia, has been found in many CFS patients, according to a study conducted by the Center for Disease Control (www.cdc.gov). With more than three-quarters of a million people in the United States exhibiting a CFS-like condition, it is becoming a serious health concern.¹

The causes for CFS are still undetermined. Some studies suggest multiple nutrient deficiencies can trigger chronic fatigue. Therefore, proper nutrition, consisting of a well balanced diet is vitally important. Fresh fruits and raw foods are especially recommended. Herbs that are helpful include ginkgo, astragalus, red clover, dandelion and short term use of echinacea to help boost the immune system, which is always affected by CFS. To help improve the interrupted sleep pattern, valerian root or melatonin at bedtime is helpful.

Although numerous studies have been conducted to find the underlying causes of CFS, *none have succeeded in understanding its physiological or chemical pathways.*² Some studies have shown that deficiencies of the adrenal or thyroid glands have been found in CFS patients. This has prompted the belief that stress can trigger CFS, whether it is of mental or physical origin. Therefore energy boosting therapies as well as vitamins and antioxidant supplementation to combat free radical proliferation is often considered to be extremely important.

¹ Gerrity TR, et al., "Chronic fatigue syndrome: what role does the autonomic nervous system play in the pathophysiology of this complex illness?" *NeuroImmunoModulation*, V. 10, p. 134-141, 2002

² Fukuda K, et al., "The chronic fatigue syndrome: a comprehensive approach to its definition and study." *Annals of Internal Medicine*, V. 121, p. 953-959, 1994

How do free radicals deplete cellular energy? Free radical proliferation is linked to pathological changes that cause cellular malfunction or mutation (i.e. cancer) as well as protein degradation. Free radicals also play a large role in causing damage to all cells of the body but particularly the immune system. Free radicals also *deplete cellular energy* by interfering with mitochondrial function and contribute to shortened lifespan, according to studies with animal species.³ Cellular energy generation in the mitochondria is both a key source and key target of oxidative stress in the cells. Seeking an electron to complete the radical, free radicals cause chain reactions as electrons are ripped from molecules, creating another free radical. Cellular energy generation in the mitochondria is both a key source and key target of oxidant stress in the cell. One can therefore envision a model whereby the inevitable increased production of free radicals compromises mitochondrial efficiency and eventually energy output in a detrimental feedback loop.⁴

Antioxidants such as vitamin A, vitamin E, selenium and coenzyme Q10 supply free electrons and are usually prescribed by naturopathic doctors in order to provide limited relief in counteracting free radical ravages, as long as they are taken regularly. However, electronic antioxidants produced by bioelectromagnetic (BEM) therapy can also satisfy and terminate free radicals, by abundantly supplying the key ingredient usually found only in encapsulated antioxidant supplements...the electron.⁵ Indeed, such a pattern of confirmation has been found through our preliminary studies before and after electrotherapy with the *Pharmanex BioPhotonic Scanner* which tests for carotenoid (vitamin A) levels in the blood. The carotenoid levels of the blood are noticeably higher after high voltage electrotherapy, suggesting that free radical levels have dropped since they are not consuming carotenoids at the same rate as before therapy.

Another indicator of immune system status and energy storage level of the body is the voltage that is maintained across all of its cell membranes. The so-called transmembrane potential (TMP), typically in the hundred thousand volt range per centimeter, is often found to be much lower during stress and disease states, indicating lower energy levels in the body. In this case, modern medicine does not offer a chemical supplement or pharmaceutical concoction to provide relief. However, the high voltage electric fields presented to the body by bioelectromagnetic therapy can be reasonably expected to boost the TMP directly.⁶

It is known that damaged or diseased cells present an abnormally low TMP about 80% lower than healthy cells.^{7,8} This signifies a greatly reduced metabolism and, in particular, impairment of the electrogenic sodium-potassium (Na-K) pump activity and therefore, reduced ATP production. The sodium-potassium pump, within the membrane, forces a ratio of 3Na ions out of the cell for every 2K ions pumped in, for proper metabolism. An impaired Na-K pump results in

³ Smith P, editor, "Pathways of aging" *Life Extension*, January, 2004, p. 33

⁴ Campisi J. "Aging, chromatin, and food restriction—connecting the dots" *Science*, Sept., 2000, V. 289, No. 5487, p. 2062-3

⁵ Valone TF, *Bioelectromagnetic Healing: A Rationale for Its Use*, Integrity Research Institute, 2003, p. 37

⁶ Valone, p. 27

⁷ Ceve, G. "Membrane Electrostatics," *Biochim Biophys Acta*, 103(3):311-82, 1990 **Medline 91027827**

⁸ Malzone, A. et al, "Effect on cellular and tissue metabolism of induced electrical currents" *Arch Stomatolgy* 30(2):371-82 **Medline 90314754**

edema (cellular water accumulation) and a tendency toward fermentation, a condition known to be favorable toward cancerous activity.

A Nobel Prize winner, Dr. Albert Szent-Gyorgi, proposed that cell membranes also rectify alternating currents since structured proteins behave like solid-state diodes.⁹ (A diode passes electricity in only one direction.) It is reasonable therefore to conclude, based on these biophysical principles, that an endogenous high voltage EMF potential of sufficient strength will theoretically *stimulate the TMP, normal cell metabolism, the sodium pump, ATP production and healing*. This far-reaching generalization has already been found in the literature: “*TMP is proportional to the activity of this pump and thus to the rate of healing.*”¹⁰ Furthermore, “increases in the membrane potential have also been found to increase the uptake of amino acids.”¹¹ Electromedicine therefore, appears to connect to and recharge the storage battery of the TMP, just as sunlight baths connect to and recharge the storage battery of biophotons in cellular DNA.

Will high voltage electrotherapy become the medicine of the future? Similar expectations were voiced 100 years ago when pioneers such as Tesla, Rife, and Lakhovsky served medical doctors with their remarkable inventions in electromedicine. Only superior clinical studies along with perseverance and determination to change the pharmaceutical dependency in this country may make the difference this time around. In the meantime, those suffering from chronic fatigue syndrome may find that relatively simple steps can be taken to reduce debilitating free radical attack and boost ATP production through TMP recharging by regular, brief electromedicine treatments.

⁹ Szent-Gyorgi, A., *Introduction to Submolecular Biology*, Academic Press, NY, 1960. Also, *Bioelectronics*, Academic Press, NY 1968, and *Electronic Biology*, Marcel Dekker, NY 1976 (See Appendix, p. 46)

¹⁰ Jorgenson, W. A. and B.M. Frome, C. Wallach. “Electrochemical Therapy of Pelvic Pain: Effects of Pulsed Electromagnetic Fields (PEMF) on Tissue Trauma,” *European Journal of Surgery*, 1994, Supplement 574, p. 86

¹¹ Bockris, J.M. et al. *Modern Aspects of Electrochemistry*, No. 14, Plenum Pub., New York, 1982, p. 512