End Fatigue

The Adrenal Gland

(Excerpted from the book *"From Fatigued to Fantastic!"*)

The adrenal glands, which sit on top of the kidneys, are actually two different glands in one. The center of the gland makes epinephrine (also known as adrenaline—for the adrenaline "junkies" out there) and is under the control of the autonomic nervous system. Although it is known that this part of the nervous system is also on the fritz in chronic fatigue patients—contributing to such symptoms as hot and cold sweats, cold sweaty hands, neurally mediated hypotension, and panic attacks—it is not understood if or how this ties into the adrenal's ability to make adrenaline in CFS/FMS. More likely, adrenaline deficiency is a central brain problem.

The outer part of the adrenal gland, the cortex, also makes many important hormones. These include:

1. **Cortisol.** The adrenal glands increase their production of cortisol in response to stress. Cortisol raises blood sugar and blood pressure levels and moderates immune function, in addition to playing numerous other roles. If the cortisol level is low, the person has fatigue, low blood pressure, hypoglycemia, poor immune function, an increased tendency to

allergies and environmental sensitivity, and an inability to deal with stress.

2. **Dehydroepiandrosterone sulfate (DHEA-S).** Although its mechanism of action is not clear, DHEA is the most abundant hormone produced by the adrenal cortex. If it is low, you will feel poorly. DHEA-S levels normally decline with age, but appear to drop prematurely in chronic fatigue patients. Patients often feel much better when their DHEA-S levels are brought to the mid-normal range for a twenty nine year-old.

3. **Aldosterone.** This hormone helps to keep salt and water balanced in the body.

4. **Estrogen and testosterone.** These hormones are produced in small but significant amounts by the adrenals as well as by the ovaries and testicles.

Symptoms of Adrenal Insufficiency

If your adrenal glands are under active, what might you be experiencing? Low adrenal function can cause, among other symptoms:

• Fatigue
• Recurrent infections
• Difficulty shaking off infections
• Poor response and "crashing" during stress
• Achiness
• Hypoglycemia (low blood sugar with irritability when hungry)
• Low blood pressure and dizziness upon first standing

Hypoglycemia deserves special mention. Many people with CFS/FMS

sometimes become shaky and nervous, then dizzy, irritable and fatigued. These people often feel better after they eat sweets, which improve their energy and mood for a short period of time. Because of this, these people often crave sugar, not realizing that it makes their blood sugar level initially shoot back up to normal, which is what makes them feel better, but then makes it continue shooting up beyond normal. The body responds to this by driving the sugar level back down below normal again. The effect, energy-wise, is like a roller coaster.

Dr. Jefferies has noted—and again, my experience confirms his finding—that most people with hypoglycemia have under active adrenal glands. This makes sense because the adrenal glands' responsibilities include maintaining blood sugar at an adequate level during stress. Sugar is the only fuel that the brain can use. When a person's blood sugar level drops, he or she feels anxious, irritable, and then tired.

Causes of Adrenal Insufficiency

About two-thirds of chronic fatigue patients appear to have underactive adrenal glands.[1] One reason may be that the hypothalamus does not make enough corticotrophin-releasing hormone (CRH), which is the brain's way of telling the adrenals that more cortisol is needed. I suspect that many people also have adrenal exhaustion. Dr. Hans Selye, one of the first doctors to research stress reactions, found that if an animal becomes severely overstressed, its adrenal glands bleed and develop signs of adrenal destruction before the animal finally dies from the stress.

If you think back to your biology classes in high school, you may

remember something called the fight-or-flight response. This is a physical reaction that occurs during times of stress. During the Stone Age, when a caveman met an animal that wanted to eat him, the caveman's adrenal glands activated multiple systems in his body that prompted him to either fight or run. This reaction helped the caveman survive. In those days, however, people probably had a couple of weeks or months to recover before facing the next major stress. In today's society though, people often experience stress reactions every few minutes. I suspect that many people suffer exhaustion of their adrenal glands, but without the adrenal gland destruction that Hans Selye saw in his experimental animals. With the kinds of stresses common in modern society, a person's adrenal test may initially show hormonal levels that are actually higher than usual (but possibly still inadequate to deal with the degree of stress), since the adrenal gland increases hormonal output to deal with the many burdens placed on your body. Over time, this may exhaust the adrenal reserve—that is, the adrenal's ability to increase hormone production in response to stress. At this point the hormone levels may then drop to overtly deficient levels. This is why some studies show low adrenal hormone levels and others show normal levels.[2]

In endocrinologist Dr. William Jefferies' experience (and in mine as well), people with either low hormone production or a low reserve often respond dramatically to treatment with a low dose of adrenal hormone.[4,5]

Dr. Jefferies' opinion is that everyone who has unexplained, disabling chronic fatigue should be given a low-dose trial of adrenal hormone.[5] Both natural over the counter adrenal support and bioidentical ultra low

dose cortisol (cortef) can dramatically improve your well being in this setting!

Treating Adrenal Insufficiency

People with hypoglycemia, which in CFS/FMS is most often caused by inadequate adrenal function, can treat low blood sugar symptoms by cutting sugar and caffeine out of their diets; having frequent, small meals; and increasing their intake of proteins while decreasing carbohydrates. It's best to avoid white flour and sugar and to substitute complex carbohydrates such as whole grains and vegetables. Fruit—not fruit juices, which contain concentrated sugar—can be eaten in moderation, about one to two pieces a day, depending on the type of fruit. If you get irritable, eat something with protein. For quick relief, put a quarter to half a teaspoon of sugar (or even just 1 or 2 Tic Tacs) under your tongue at the same time. This is enough to quickly raise your blood sugar levels but not enough to put you on a sugar "roller coaster ride."

More directly, treating the under active adrenal problem with low doses of adrenal hormone usually quickly banishes the symptoms of low blood sugar. I like to begin with natural hydrocortisone such as Cortef (by prescription at most pharmacies) or, better yet, sustained release hydrocortisone from a compounding pharmacy. This immediately gives your body the support that your adrenal gland is unable to give, and may help you feel much better very quickly. The added cortisol also takes some of the strain off your adrenals so that they can heal.

There are also many natural things that you can take that can both help to

support your adrenal glands, while also naturally raising your body's cortisol level.

Natural Adrenal Support

Below are several things that can be very helpful in supporting your adrenal glands to heal:

1. Adrenal glandulars supply the raw materials that your adrenal glands need to heal. It is critical however that you get them from reputable companies (I recommend Enzymatic Therapy) so that the purity and potency is guaranteed and so you can be sure that they come from cows that are not at risk of transmitting infections.

2. Vitamin C is critical for adrenal function. Your body's highest levels of vitamin C are found in the adrenal glands and brain tissues, and the urinary excretion of Vitamin C is increased during stress. Optimizing vitamin C intake by taking 500-1,000 mg a day will also help immune function.

3. Pantothenic acid, a B vitamin, also supports adrenal function, and Pantothenic acid deficiency causes shrinking of your adrenal glands. Optimal levels are approximately 100-150 mg daily, although some physicians use even higher levels for adrenal support.

4. Licorice also slows down the breakdown of adrenal hormones in your body, helping to maintain optimal levels. There is no licorice in licorice candies in the United States because of this. Another beneficial effect of the licorice is that it helps in the treatment of indigestion, and it is even as

effective as the prescription heartburn medication Tagamet. Do not take licorice if you have high blood pressure, as too much licorice can cause excess adrenal function and worsen high blood pressure. You can safely take 200-400 mg a day of a licorice extract standardized to contain 5 percent glycyrrhizic acid.

5. Chromium also helps decrease the symptoms of low blood sugar. Take 200 mcg a day.[49] If you'd rather not take these natural remedies separately, or just to simplify the supplementation, you can take Adrenal Stress End, which I helped the Enzymatic Therapy Company to develop. Take 1-2 capsules in the morning. If symptoms recur in the afternoon, add another capsule at lunch. Adrenal Stress End, combined with the Energy Revitalization System vitamin powder (which supplies outstanding overall nutritional support easily and affordably), will supply everything noted above, as well as many other nutrients that will help support adrenal function.

To summarize, if your symptoms started suddenly after a viral infection, if you suffer from hypoglycemia (irritability when hungry), "crash" with stress, or if you have recurrent infections that take a long time to resolve, you probably have under active adrenal glands. About two-thirds of my severe chronic fatigue patients have under active or marginally functioning adrenal glands or a decreased adrenal reserve. Using Adrenal Stress End, and in more severe cases adding ultra low dose cortisol (cortef by prescription), can be done very safely, can allow your adrenal glands to heal, and can give you back your life!

For more information:

For an in depth discussion of adrenal problems and how to treat them, see my book *"From Fatigued to Fantastic!"*

For an excellent technical/medical review on the safety, effectiveness, and need for adrenal support in CFS/FMS, I refer you to the excellent recent research review below by my friend and colleague Kent Holtorf MD. See full text.

Diagnosis and Treatment of Hypothalamic-Pituitary-Adrenal (HPA) Axis Dysfunction in Patients with Chronic Fatigue Syndrome (CFS) and Fibromyalgia (FM)

There is controversy regarding the incidence and significance of hypothalamic-pituitaryadrenal (HPA) axis dysfunction in Chronic Fatigue Syndrome (CFS) and Fibromyalgia (FM). Studies that utilize central acting stimulation tests, including CRH, IST, d-fenfluramine, ipsapirone, IL-6 and metyrapone testing, have demonstrated that HPA axis dysfunction of central origin is present in a majority of these patients.

However, ACTH stimulation tests and baseline cortisol testing lack the sensitivity to detect this central dysfunction and have resulted in controversy and confusion regarding the incidence of HPA axis dysfunction in these conditions and the appropriateness of treatment.

While both CFS and FM patients are shown to have central HPA dysfunction, the dysfunction in CFS appears to be at the pituitary-hypothalamic level while the dysfunction in FM is more related to dysfunction at the hypothalamic and supra-hypothalamic levels.

Because treatment with low physiologic doses of cortisol (< 15 mg) has been shown to be safe and effective and routine dynamic ACTH testing does not appear to have significant diagnostic sensitivity, it is reasonable to give a therapeutic trial of physiologic doses of cortisol to the majority of patients with CFS and FM, especially to those who have symptoms that are consistent with adrenal dysfunction, have low blood pressure, or have baseline cortisol levels in the low or low-normal range.

Kent Holtorf, MD
Diagnosis and Treatment of Hypothalamic-Pituitary-Adrenal (HPA) Axis Dysfunction in Patients with Chronic Fatigue Syndrome (CFS) and Fibromyalgia (FM)
Journal of Chronic Fatigue Syndrome, vol 14 #3, 2007

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