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## Are All Chronic Fatigue Syndrome and Fibromyalgia Patients Low Thyroid?

There is mounting evidence that there is low thyroid activity present in the majority of chronic fatigue syndrome and fibromyalgia patients. Studies demonstrate that in addition to an increased incidence of primary hypothyroidism in chronic fatigue syndrome and fibromyalgia, there is a combination of secondary, tertiary and thyroid resistance in the overwhelming majority of CFS and FM patients, despite having normal thyroid tests because these latter forms of tissue hypothyroidism are not detected by standard thyroid function tests. Thus, many chronic fatigue syndrome and fibromyalgia patients are erroneously told over and over that their thyroid levels are fine.

TSH is secreted by the pituitary in the brain and stimulates the thyroid to secrete T4, which is not the active thyroid hormone. T4 must then be converted in the body to the active thyroid hormone T3. When T4 and T3 levels drop, the TSH should increase indicating hypothyroidism. This is the standard way to diagnose hypothyroidism and is the only way that the majority of physicians (endocrinologists, internists, family practitioners, ect.) know how to test for low thyroid levels. There are, however, multiple abnormalities in CFS and FM that result in tissue hypothyroidism that are not detected using the standard TSH, T4 and T3 testing. In fact, standard thyroid tests fail to detect tissue hypothyroidism 80-90% of the time in patients with chronic fatigue syndrome and fibromyalgia.

There is clearly hypothalamic and pituitary dysfunction in these conditions (can potentially be caused by viruses, bacteria, stress, yeast, inflammation, toxins, pesticides, plastics and mitochondria dysfunction). The hypothalamic dysfunction results in the production of TSH that has diminished biological activity so there are lower T4 and T3 levels for any given level of TSH. In addition, the pituitary dysfunction results in a diminished secretion of TSH, masking low

tissue thyroid levels as the TSH is usually in the normal range. Very few doctors understand the significance of this and incorrectly state that the thyroid is fine based on a normal TSH level.

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Furthermore, many chronic fatigue syndrome and fibromyalgia patients have relatively diminished T4 to T3 conversion and a relatively increased T4 to reverse T3 conversion, also resulting in low tissue levels of active thyroid hormone levels despite having a normal TSH. (See the handout *Fatigued, Depressed, Difficulty Losing Weight*). The type II deiodinase that converts T4 to T3 is down regulated in chronic fatigue syndrome and fibromyalgia while the type III deiodinase enzyme that increases T4 to reverse T3 (rT3) is unregulated in these conditions. This maladaptive response decreases the T3/rT3 ratio, further diminishing tissue thyroid levels but are also not detected by standard testing. The T3 and rT3 levels can be measured and the ratio calculated, but merely finding normal T3 and reverse T3 levels is not adequate to detect this abnormality.

Another significant cause of low tissue thy-

roid levels in chronic fatigue syndrome and fibromyalgia that is not detected by standard testing is the fact that there has been shown to be a peripheral thyroid hormone resistance found in these patients, meaning that there is a diminished thyroid effect for a given amount of thyroid hormone in the blood. This has been discounted in the past, but more and more evidence is surfacing proving that this is indeed a significant problem with these conditions.

The combination of factors present in chronic fatigue syndrome and fibromyalgia, including hypothalamic and pituitary dysfunction, diminished T3/rT3 production ratios and thyroid resistance, results in most, if not all, chronic fatigue syndrome and fibromyalgia patients having inadequate tissue thyroid effect. T4 preparations such as Synthroid and Levoxyl rarely work and Armour thyroid, a pig glandular product, is somewhat better, but definitely not adequate for most patients. The treating physician must know when to use a T4/T3 combination or straight T3. T3 works the best for many of these patients, but Cytomel, a very short acting T3 available at normal pharmacies, is also a poor choice because the varying blood levels can cause significant side effects. Compounded timed release T3 is usually the best treatment. However, to achieve significant improvement, the treating physician must be very knowledgeable about T3 and must realize that when on T3, standard bloods blood test will lead one to dose incorrectly and not obtain significant benefits. This includes doctors who previously felt that they were thyroid experts and had been using thyroid with in chronic fatigue syndrome and fibromyalgia for a long time. Ultimately, it is the expertise and dosing of the T3 or T4/T3 combinations and the makeup of the medications that determines the optimal treatment regimen and is one major component in the treatment of in chronic fatigue syndrome and fibromyalgia.