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**Thyroidism: “Hyper-“ or “Hypo-“ ?**

Problems with thyroid function are really quite common. How would you tell if your thyroid was under-functioning (hypothyroidism) or over-functioning (hyperthyroidism)? The two have distinctly different symptoms affecting some of the same systems.

The thyroid gland sits in the front at the base of the neck. It's hormones T3 (Tri-iodothyronine) and T4 (Thyroxine) regulate the resting rate of energy metabolism. The thyroid gland adds onto the amino acid tyrosine, 3 (T3) or 4 (T4) iodine molecules to make these hormones. T3 is about 200 times more physiologically active than T4, so some experts consider T4 to be almost a pro-hormone. Though the thyroid gland produces about 80% T4 & 20% T3, the liver & kidneys are able to convert T4 to T3 in a reaction that requires Selenium. If Selenium deficiency exists, the conversion from T4 to T3 may be blocked, producing low thyroid function. This is why Synthroid (Levothyroxine) may not work as well as NP-Thyroid or Armour Thyroid (extracts of real thyroid). Free T3 & free T4 are the levels unbound to serum proteins, & the physiologically active component. Sometimes the thyroid makes elevated quantities of reverse T3 (with the iodine in the opposite position from normal T3), which act as a thyroid function blocker. The pituitary master gland of the body produces Thyroid Stimulating Hormone (TSH), which stimulates the thyroid gland to make more thyroid hormones. When the TSH level is above 4.5, the thyroid gland is having to be flogged to produce sufficient hormones, & hypothyroidism is developing or exists. When the TSH is below 0.35, usually there is excess thyroid hormone present (though there are exceptions).

Symptoms of low thyroid levels (Hypothyroidism) include:

Fatigue Low body temperature Coarse, dry skin Hair loss

Feeling cold Mental sluggishness Slow heart rate Depression

Weight gain Elevated Cholesterol Constipation Slowed reflexes

Symptoms of high thyroid levels (Hyperthyroidism):

Fatigue Irritability Smooth, sweaty skin

Feeling hot Elevated body temperature Fast heart rate

Diarrhea Reduced Cholesterol Hyper reflexes Weight loss

If symptoms are suggestive, laboratory tests can help confirm low or high thyroid levels. However, there are several situations where the laboratory tests can be normal, and low thyroid function can exist. It is well known that in diabetes, insulin levels can be normal or even elevated, but elevated blood sugar occurs because the effect of the hormone is blunted by resistance at the level of the insulin receptor on cells, or insulin resistance. It is not widely appreciated that symptoms of low thyroid can be caused by normal circulating thyroid hormone levels with resistance at the thyroid receptor on cells. Vitamin A deficiency is at least one factor that can contribute to this phenomenon.

It is also possible for various toxins (such as those produced by the bacteria in Lyme disease) to impair the pituitary's ability to appropriately produce TSH. This results in inappropriately low TSH with T3 and T4 running in the lower ranges of normal. It's important to know that the ranges listed as normal on a laboratory test are a statistical norm (2 standard deviations from the mean) for a population of people without overt symptoms of low or high thyroid. These normal ranges are not a given individual's optimal level, so numbers in the low normal range may reflect deficiency if that person's norm is in the high range of normal. If symptoms of a low thyroid are present, it is often worth a trial of thyroid hormone replacement to see if the symptoms improve. 11/22