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Take Control of Your Health

Unlocking the Secrets of Hormone Health and Vitality

Analysis by Dr. Joseph Mercola | November 29, 2026

STORY AT-A-GLANCE

- I interviewed U.K. clinician Keith Littlewood about endocrine health, revealing details that may be useful for understanding and supporting your endocrine health
- Littlewood, who splits his time between consulting with patients and completing a Ph.D. in endocrine research, bases his work on that of scientists like Ray Peat and has extensive clinical experience
- Littlewood believes estrogen dominance and estrogen excess are among the primary causes of thyroid disruption
- Littlewood recommends targeting your diet first to address your thyroid health, including getting enough protein, calories, and healthy carbohydrates, and making sure you can utilize those carbohydrates
- Addressing thyroid problems involves a comprehensive approach that addresses what you're eating — avoiding low-carb and low-calorie diets — your stress levels and your exposure to environmental pollutants, like endocrine-disrupting chemicals, along with exercise, such as walking

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Endocrinology is a branch of medicine that focuses on the study of hormones and the glands and tissues that produce them. It addresses the intricate balance of hormones that regulate many of your body's essential functions, and how to keep them in the

proper equilibrium. I interviewed U.K. clinician Keith Littlewood on this topic, revealing details that may be useful for understanding and supporting your endocrine health.

Littlewood, who splits his time between consulting with patients and completing a Ph.D. in endocrine research, bases much of his work on Ray Peat and has extensive clinical experience on how to improve energy, metabolism, digestion, sleep, fertility, and other key foundations of optimal health.

The Importance of Understanding Thyroid Physiology

One of Littlewood's areas of focus is looking at how endocrine disruptors affect thyroid physiology at the molecular level and the super molecular level. Of the many hormones in your body, thyroid hormones are perhaps the most important, as they regulate your metabolism and are required for nearly every physiological process in your body. When your thyroid levels are unbalanced, the effects can be wide-ranging.

Thyroid dysfunction has been associated in the clinical literature with a range of health issues, including fibromyalgia, irritable bowel syndrome, eczema, gum disease, and autoimmune disorders. However, observational associations of this kind do not establish that thyroid imbalance causes these conditions.

This is because your thyroid impacts various parts of your body, making the symptoms of dysfunction diverse. Your hypothalamus secretes thyrotropin-releasing hormone (TRH) that triggers your pituitary gland to release thyroid-stimulating hormone (TSH) that then causes your thyroid to release T4.

Approximately 90% of **your thyroid hormone** is released in the relatively inactive form T4, according to standard endocrinology references.[1] Deiodinase enzymes then convert T4 into the active form, T3 — primarily in your liver and kidneys, though the conversion also takes place in other tissues. Thyroid problems may exist, however, even when standard thyroid function tests show normal results. Littlewood says:

"TSH can be just a completely redundant test for multiple reasons … even abundance of T4 can be problematic and stimulate certain pathways. And that's really why … T3 should be being looked at as opposed to TSH because stressed people have generally suppressed TSH values.

Chronic dieters can have suppressed TSH values. There are hormone-disrupting chemicals in the environment that can suppress how thyroid function is being modulated.

And I think that makes it even more complex when a clinician would just look at TSH and T4 and go, 'Well, your blood tests are completely normal, let's move on to something else or it's in your head.' This is a common theme that I've seen well over a decade now with clients who've had their blood tests and just because they looked at these two markers, they're euthyroid [normal thyroid function] rather than potentially hypothyroid.

… just looking at TSH and T4 on its own, it can be very muddy water to look into. That's why the relatively crude test of temperature and pulse can be pretty useful. But again, you want other markers as well. You want cholesterol, you might want to look at prolactin, other hormone levels, you might want to look at lactate, all of these other markers that could be useful in getting you to understand what thyroid is actually doing."

While people with subclinical hypothyroidism will often have normal lab work, low body temperature and pulse rate have long been used clinically as supporting signs worth investigating — though neither is diagnostic on its own. Also, a TSH toward the lower end of the reference range is often viewed favorably, but it can also be suppressed by cortisol and adrenaline — so, a low reading is not automatically reassuring. Checking your temperature and pulse after eating is one way to double-check that.

A cholesterol test can also be helpful. In the bioenergetic literature, elevated cholesterol (mid- to high-200s) is interpreted as a possible sign that the conversion of cholesterol into steroid hormones is sluggish, and low cholesterol is associated with infection.

These interpretations are not established in conventional endocrinology and are best reviewed with a clinician who knows your history. If you decide to go on this route, talk to your health care provider about whether this testing is appropriate for you.

The Primary Causes of Thyroid Disruption

While there are dozens of factors that may disrupt thyroid function, Littlewood believes estrogen dominance and **estrogen excess** are among the primary causes.

> *"I think if we look to the major kind of cohort who tend to suffer the most, it's women … estrogen will suppress thyroid function and when there's an estrogen dominance and estrogen excess, it will suppress how much thyroid hormone is being produced," he says. "This kind of state will need supplementing with thyroid hormone because thyroid hormone will help increase estrogen metabolism."*

That said, note that thyroid hormone is a prescription therapy. Whether it is appropriate, and at what dose, is a decision for a qualified clinician who can diagnose and monitor treatment — not something to start on your own.

Other factors, including diet and environmental pollution, also need to be addressed. "The diet becomes intricately involved with trying to resolve this. You can't just throw thyroid hormones and expect that you're going to, A, lose weight and B, resolve all those issues because if you don't have enough energy in the tank, then you're not going to be able to function at that point as well," Littlewood says.

He mentions Brassica vegetables, such as cabbage, Brussels sprouts, broccoli, and cauliflower, which contain thiocyanates that may suppress thyroid function in large quantities, as one example. However, he adds that environmental pollutants can also be damaging, particularly if you have a genetic predisposition for thyroid problems or your diet isn't ideal. These factors can compound one another, in what Littlewood describes as a “perfect storm”:

"If you've got poor inheritable traits … your nutrition's not in good order … you're under lots of stress and you're exposing yourself to certain endocrine disruptors … [via] food choices, certain pesticides, very polluted environments in the city, perhaps even wireless exposure … All of these things can create a perfect storm. So, it becomes almost like a clinical ecology exercise to start with.

What can you remove from your environment that might be damaging you? And that could be a thousand different things for a thousand different people. So that's where it becomes quite useful to do your due diligence about what somebody needs. It's a needs analysis to get people to where they want to be. There's no point in just saying, 'Hey, his thyroid hormone, everything's going to work out right,' because it never happens like that."

Get Your Diet Right First

Many lifestyle factors can contribute to low thyroid function, including stress, inadequate light exposure and exposures to endocrine-disrupting chemicals. In terms of diet, high polyunsaturated fat (PUF) intake, including **linoleic acid**, is one factor that has drawn attention, as research suggests PUFs may interfere with your cells' ability to use active thyroid hormone.

With so many factors affecting your endocrine health, where should you begin to get it all sorted out? Littlewood recommends targeting your diet first:

"One of the most common themes that I've found — and my practice is probably about 70% females overall — it's getting enough protein in, it's getting enough calories in, it's getting enough carbohydrates in and making sure that you can utilize those carbohydrates quite well … what you should be able to do is utilize carbohydrates as a fuel, everybody should be able to do it."

Low-carb diets may work against healthy thyroid function. For healthy thyroid function, you need to make sure T4 can be efficiently converted into T3.

To support the conversion of T4 to T3, focus on whole, unprocessed or minimally processed foods, with enough protein and easily digested carbohydrates that are less likely to cause intestinal irritation or endotoxin production — whole fruits and white rice are the usual starting points in this regard. Littlewood explains that he often sees issues among his patients who have followed low-carb diets:

> *"This is something that I've seen with lots of females coming in who've gone keto, they've gone carnivore and they're experiencing more disturbed menstrual cycles, increased hair loss. You can see that they're progesterone deficient. You see that estrogen taking a hold, and this is where it becomes problematic and you start to see the sleep, the digestion, the mood, energy, all of these things that tend to go out of whack.*
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> *So, I would say that the diet is the base for everybody to get that right. A lot of people are unsure of some of the chemicals that are around, and they tend to become more aware of that as the process goes on.*
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> *So, I do think it's getting the diet right first of all. I think it's becoming aware of the things that could potentially disrupt thyroid, decrease progesterone, increase estrogen, and then you could start to look at that straight away. But it's certainly something, I often work for at least a month or two, getting the diet right before you even consider entertaining them to think about thyroid hormone."*

Fixing your gut health is also important. "Digestion goes hand in hand with thyroid. It goes hand in hand with regulating thyroid, absorbing thyroid from the gut as well, and also how to regulate insulin as well. And if you can't digest your nutrients, you are always going to have a problem with supporting the thyroid," Littlewood says.

The Estrogen Connection

As I noted in this interview, many people believe that they are low in estrogen due to bloodwork, when they actually have high levels in their organs. This is because serum estrogen levels are not fully representative of estrogen that's stored in tissues. Estrogen can be low in plasma, but high in tissues.[2,3,4] Littlewood agreed:

> *"Yep. I would concur with that. I mean, where is the highest amount of T3 found? The highest amount of T3 is found intracellularly. It's not in serum. So if you apply that rationale to estradiol, for example, and maybe the other weaker estrogens like estrone and estriol, they are going to be in the tissues.*
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> *Now, bear in mind, if you have any amount of adipose tissue, you are generating estrogen by default, and the amount of aromatase that's being produced will convert testosterone and other hormones also to estrogen. So looking at the serum test, I think urinary tests can be useful, but again, they have their pitfalls because they're not representative of systemic tissue status of these hormones."*

Estrogen appears to inhibit the conversion of T4 to T3, and, in my view, excess estrogen is among the more significant contributors to cancer risk — a position that sits outside the conventional consensus. Many clinicians also assume serum levels are equivalent to tissue levels, which may not hold. If that is right, some people may be reassured by a low serum result while tissue exposure remains higher.

One indirect option some clinicians use to gauge estrogen activity in fat and tissues is a prolactin blood test, though prolactin is not a validated measure of tissue estrogen. With this in mind, estrogen promotes the production of prolactin, which is a hormone produced by the pituitary gland. If you decide to have it tested, talk to your health care provider whether it's appropriate for you:

> *"Prolactin can be very, very useful. I think keeping prolactin round about 10 milligrams per deciliter is the general idea. I think the average reference range is anywhere from 20 up to a couple of hundred … when you start to see prolactin*

that high, you start to infer that there're going to be some problems probably related to high estrogen.

Sometimes you can actually look at someone and tell whether they're estrogen dominant. You can certainly see it in guys drinking a lot of beer, a lot of phytoestrogens. You will tend to see a combination of weight gain that is promoted by high phytoestrogen exposure.

And in females, you can see that too. There are certainly estrogen-like traits with increased adiposity, certainly hormone dysregulation, which can go from dysregulated cycles to heavy clotting to dysmenorrhea, amenorrhea.

It can go both ways. And there are, again, the mixing or muddying of the water tends to be conflated by the increased estradiol will suppress thyroid hormone, will suppress progesterone … I think keeping prolactin as low as possible is great. And … progesterone will do that. It is predominantly a female hormone, but men do need it as well."

How to Use Progesterone

Before the detail that follows: Transmucosal progesterone therapy requires a prescription and a clinician's supervision. What is described below is how it is used under that supervision. It is not a protocol to begin on your own, and progesterone is not a supplement you should self-dose — it is a hormone, and the right dose, the right timing, and whether it is appropriate at all depend on your own circumstances.

If you are pregnant, trying to conceive, on hormonal contraception or being treated for a hormone-sensitive condition, this needs a doctor before anything else.

It’s also important to understand that progesterone is not a magic bullet, and that you get the most benefit by implementing a Bioenergetic diet approach that allows you to effectively burn glucose as your primary fuel without backing up electrons in your

mitochondria that reduces your energy production. My book, “Your Guide to Cellular Health: Unlocking the Science of Longevity and Joy,” covers this process in great detail.

Once you have dialed in your diet, an effective strategy that can help counteract estrogen excess is to take transmucosal progesterone (i.e., applied to your gums, not oral or transdermal), which is a natural estrogen antagonist. Progesterone is one of only three hormones I believe many adults can benefit from. (The other two are DHEA and pregnenolone.)

I do not recommend transdermal progesterone, as your skin expresses high levels of 5-alpha reductase enzyme, which causes a significant portion of the progesterone you're taking to be irreversibly converted primarily into allopregnanolone and cannot be converted back into progesterone.

Ideal Way to Administer Progesterone

Please note that when progesterone is used transmucosally on your gums as I advise, the FDA believes that somehow converts it into a drug and prohibits any company from advising that on its label. This is why companies promote their progesterone products as “topical.”

However, please understand that it is perfectly legal for any physician to recommend an off-label indication for a drug to their patient. In this case, progesterone is a bioidentical hormone rather than a synthetic progestin, and the two have different safety profiles — the risks associated with progestins in the hormone therapy literature do not transfer straightforwardly to bioidentical progesterone.

That is not the same as being risk-free at any dose, however. Progesterone is sedating, can affect mood, and interacts with other medications, so the dose must be established in collaboration with the prescribing clinician.

Dr. Ray Peat has done the seminal work in progesterone and probably was the world's greatest expert on progesterone. He wrote his Ph.D. on estrogen in 1982 and spent most of his professional career documenting the need to counteract the dangers of excess estrogen with low-LA diets and transmucosal progesterone supplementation.

He determined that most solvents do not dissolve progesterone well and discovered that vitamin E is the best solvent to optimally provide progesterone in your tissue. You just need to be very careful about which vitamin E you use, as many supplemental vitamin E products are synthetic and do not provide the form your body uses.

It is imperative to avoid using any synthetic vitamin E (alpha tocopherol acetate — the acetate indicates that it's synthetic). Natural vitamin E will be labeled “d alpha tocopherol.” This is the pure D isomer, which is what your body can use.

There are also other vitamin E isomers, and you want the complete spectrum of tocopherols and tocotrienols, specifically the beta, gamma, and delta types, in the effective D isomer. Look for a label showing the full spectrum of tocopherols and tocotrienols in the D isomer form.

When it comes to application, my preferred approach is to dissolve either powdered or liquid progesterone in natural vitamin E — having established the dosing with your prescriber — and apply it directly to the gums. This transmucosal application allows for optimal absorption and use by the body.

There are also premade vitamin E-based progesterone products on the market. Just make sure they’re using natural vitamin E. The recommended time for application is 30 minutes before bed, as progesterone has an anti-cortisol effect and can increase GABA levels, promoting better sleep.

If you are a menstruating woman, you should take the progesterone during the luteal phase or the last half of your cycle, which can be determined by starting 10 days after the first day of your period and stopping the progesterone when your period starts. If you are a male or non-menstruating woman, you can take the progesterone every day for four to six months and then cycle off for one week.

This is what I have been personally doing for over a year with very good results. I am a physician so do not have any problems doing this. If you aren't a physician, you should consult one before using this therapy, as transmucosal progesterone therapy requires a doctor's prescription.

A Comprehensive Approach Works Best

Littlewood emphasizes that addressing your thyroid problems isn't as simple as taking thyroid hormones. You need to use a comprehensive approach that addresses what you're eating — avoiding low-carb and low-calorie diets — your stress levels and your exposure to environmental pollutants, like endocrine-disrupting chemicals.

"You can throw light deficiency with that as well, inadequate vitamin D," Littlewood says. "All of these things contribute to it." Often, it's the most fundamental, simple changes that make the biggest difference in your health. To that end, Littlewood also recommends regular exercise and movement, especially walking, to address endocrine issues and take your health to the next level:

> *"Very simple strategies can lead to some amazing results, and some of these things just get wrapped up in medical diagnosis, overtreatment, overdiagnosis, and I think this is still a huge problem. And like the ideas that we talked about, what are some of the things that Ray [Peat said that] have stuck with me? It's understanding that you don't need to go through this kind of overdiagnosis and overcomplication.*
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> *… exercise, I think, is key … I don't think he [Peat] placed exercise as high up there as he might've done. But again, he talked about living a life that had a lot of contentment to it and doing things that were useful and interesting, rather than spending a life of overexercising and breathless exercise, which would lead to this hyperthyroid state anyway.*

> *… the right amount of exercise, it's not too much, certainly not too little, and that's, again, something you tend to see — people who've been exercising five, six days a week push themselves into a hole. So yeah, adequate strength training, mobility training, moderate amount of cardiovascular exercise through regular walking I think is where most people need to be."*

If you want to learn more about Littlewood, you can find him via his websites, **balancedbodymind.com** and **keithlittlewood.co.uk**.

This article is for informational purposes only and does not constitute medical advice. Consult a qualified health care provider before making changes to your health regimen.

Sources and References

- [1] StatPearls [Internet], Physiology, Thyroid Function
- [2] J Steroid Biochem Mol Biol. 2003 Sep;86(3-5):245-53
- [3] Steroids. 2015 Jul;99(Pt A):76-83
- [4] Int J Mol Sci. 2021 Jan 5;22(1):466