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**Resting Metabolic Rate**

[Q&As are placed in reverse chronological order. In other words, the latest Q&As come first. Earlier ones are further down the page.]

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**April 26, 2007**

**Question:** I just read your latest update about your clinic where you do all the testing for metabolism. Didnit Dr. Broda Barnes simply have people take their temperatures to measure what's going on in their tissue?

**Dr. Lowe:** No, he didn't just have them take their temperatures. I've had the privilege of having patients who, decades ago, had also been patients of Dr. Barnes. They and I talked at great length about how he assessed and treated them.

Of course, he did use their basal body temperatures. But, according to these patients, their temperatures werenit the only measures by which he decided whether they needed thyroid hormone and how much they needed. He also physically examined them, tested their Achilles reflexes, and assessed their symptoms. In addition, he looked for other evidence of low thyroid, such as high cholesterol. As a diagnostician, then, he seems to have been as holistic as a doctor could be back then; he appears to have considered all available indicators of hypothyroidism.

No matter what he did or didn't do, there is a subset of hypothyroid patients for whom the basal body temperature is not a useful gauge of how tissues are responding to thyroid hormone. These people's temperatures don't increase even when they are overstimulated by thyroid hormone. I've seen these patients become fully free from symptoms and their metabolic rates become completely normal, yet their temperatures remain abnormally low.

I've seen the same with some thyroid hormone resistance patients. I'm one of them. For many years, I've taken my optimal dosage of T3, 150 mcg. On this dosage, I no longer have symptoms of thyroid hormone resistance. Those symptoms were mostly mild body aches; treatment-resistant trigger points; poor memory and concentration; and intermittent, severe depression. My latest basal metabolic rate (taken when I woke up from a night's sleep) was +6%. That means that my metabolic rate was 6% above the calculated normal for me. This is within the 10% plus and minus range that we consider normal. Yet, through all these better years for me, my underarm basal body temperature has remained between 96.7 and 97.2 degrees F. (Dr. Barnes defined the normal basal temperature as 97.8-to-98.2 degrees F.)

The reason some patients' temperatures remain low is what I call "differential tissue sensitivity to thyroid hormone." I came to this conclusion from many discussions with molecular biologists who do thyroid hormone research. In patients whose temperatures stay low, the temperature-raising enzymes whose gene transcription is increased by thyroid hormone (such as sodium-potassium-ATPase) are apparently partly or wholly exempt from regulation by thyroid hormone. Because of this, the patients' body temperatures simply arenit a useful gauge. They must use other physiological measures to assess their tissue responses to a particular dosage of thyroid hormone.

What we do at [The Lowe Clinic and Research Center](#) is basically, although more extensively, what Dr. Barnes did: use all available relevant indicators of hypothyroidism. Of course, we also use indicators of thyroid hormone resistance. We have more technological methods today, and we make full use of these. As a research center, we're studying how usefulness these methods are and how they can help us to help patients recover as fast as possible.

I believe other doctors caring for thyroid patients should also use multiple assessment methods for three reasons: (1) one or more measures, such as the basal temperature, may not be useful for an individual patient; (2) the more measures that point to hypothyroidism or thyroid hormone resistance, the more confident we can be in the diagnosis; and (3) from multiple abnormal measures, the doctor may learn the type of thyroid hormone product the patient needs.

Of course, during our comprehensive metabolic evaluations, we sometimes identify causes of low metabolism other than too little thyroid hormone regulation. When we do, I tailor an individualized treatment regimen for the patient. Our *full* evaluations are *comprehensive*; that is, they include the basal body temperature, but every other relevant measure available to us today. Because of this, we're usually able to learn whether a patient is hypometabolic, how low his or her metabolism is, and the most likely cause of the low metabolism. During this process, we find which measures of tissue response to thyroid hormone (and other treatments) will be most useful for the patient and the treating doctor. By providing this information to the doctor and patient, we enable them to systematically judge how the patient's tissues respond to treatment.

In short, what we're doing is building on the groundbreaking work of Dr. Broda Barnes. And we're using every tool we can to carry that work to the highest possible level in the serve of our patients.

**July 4, 2006**

**Question:** I am a general practitioner in Australia who treats many hypothyroid patients. My question is, can a hypothyroid patient benefit from using a MedGem calorimeter at home to assist in adjusting her dosage of thyroid medication? I have a patient who lives in a desolate region of Australia. She can travel to my clinic only every three months or so, and it seems that she could use the MedGem at home and provide me with the results. Can you advise me on whether it would be of benefit for her to have one?

**Dr. Lowe:** For a patient to measure his or her resting metabolic rate at home, the best option was the MedGem. Unfortunately, the company that marketed it, HealthTech, has dissolved. The portability of the MedGem, of course, was an advantage over other calorimeters. Occasionally, we've had a patient in our clinic who couldnit relax enough for us to get his or her true resting metabolic rate. We would teach the patient how to use the MedGem and let him or her take the instrument to the motel (most of our patients come from out-of-town) and use it upon awakening. That way, we were able to get a reading that was closer to a true resting rate.

Now patients who want their metabolic rates measured must find clinicians who use another indirect calorimeter, Korr's instrument called "ReeVue." An advantage of the ReeVue calorimeter is that it is better designed for clinic use than was the MedGem. The ReeVue is thereby free from some problems the MedGem imposed, such as the patient having to hold the calorimeter during the test.

If you are interested in obtaining a ReeVue calorimeter or finding another clinician who uses one and can measure your patient's metabolic rate, you can email our contact person at Korr, Shelley Steward at [stewart@korr.com](mailto:stewart@korr.com).

**March 27, 2005**

**Question:** I am a fibromyalgia patient in Tel Aviv, Israel. I suffered from fibromyalgia for the last eight years. Finally, my family doctor found that I'm hypothyroid. He prescribed 100 mcg of thyroxine (T4), but after two months, I hadnit improved. After I read your website, I convinced him to add 25 mcg of T3 to the thyroxine. Two weeks later, he increased the dose of T3 to 50 mcg. Within a week, I finally started feeling better. Three months have passed and my arm and foot pains have gone away, my depression has lifted, and my fingers and toes are no longer freezing all the time. But I'm still tired and have pain off-and-on in my back. Also, the extra 25 lbs I'd put on has only slightly gone down. Seeing the results so far, my doctor is open to your suggestions. He feels that I should also come to Boulder, Colorado to have a metabolic evaluation. I will be in the US in June and would like to come for the evaluation. My question is, how many days will I need to be in Boulder?

**Dr. Lowe:** By taking your basal body temperature and basal pulse rate for five days before coming to Boulder, you'll have completed part of your metabolic evaluation before you get here. We complete the evaluation in the clinic by measuring your resting metabolic rate and body composition. Taking those measurements and examining you physically takes up to three hours. That means that you'll need to be in Boulder only one day.

Some patients who travel to Boulder stay longer than one day, but their extended stay is to experience this beautiful part of the country. You may want to do as other patients do, however, and fly out the same day as your evaluation. You should fly into the Denver airport the day before your evaluation. We'll begin your evaluation at 9 AM and finish about noon. You can then travel back to the airport and fly out in the mid or late afternoon.

Fortunately you have a doctor who is cooperating by treating you properly. If you didn't, you could see the prescribing doctor on our treatment team. You would see him in the afternoon following your metabolic evaluation, and then you could fly out in the early evening.

I hope this answers your question, and I look forward to meeting you in person at your evaluation.

**January 9, 2005**

**Question:** Thank you for all you do. Can you please tell me if I need to be in Boulder, CO to have my metabolic rate measured? Or can I get it done here in Santa Barbara, CA?

**Dr. Lowe:** We've searched out and referred some patients to facilities in other US states that have instruments similar to those we use to evaluate patients' metabolic status. However, we've been disappointed with the results. At all but one facility, those who've done the testing have done so incorrectly or incompletely.

The most common problem has been with indirect calorimetry, the test that determines the patient's resting metabolic rate. At the facilities we've referred to, staff members didnit properly prepare patients for the testing. As a result, the testing didnit determine the patients' true resting metabolic rates; always, readings were far too high to have been true resting rates. To our dismay, this happened even when we referred patients to departments in universities that specialize in diet, nutrition, and metabolism. (This isnit, of course, an indictment of *all* such departments; but it is of those we referred to.)

The second problem is that most facilities don't provide testing for body composition. We use a highly accurate test called 4-lead bioelectrical impedance. When done properly, this test precisely measures a patient's lean body weight. Without this measurement, we can't use an important equation. The equation tells us whether the patient's resting metabolic rate is abnormally low in relation to his/her lean body weight.

Undergoing the bioelectrical impedance test (or an alternate test that's equally accurate) is *crucially* important in a metabolic evaluation. The reason is that in general, lean body weight is the most potent determinant of the resting metabolic rate. If a patient's measured resting metabolic rate is lower than predicted from his/her lean body weight, and he/she isn't restricting calorie intake, then too little thyroid hormone regulation of metabolism is distinctly likely. Hence, knowing the patient's lean body weight (which we measure with bioelectrical impedance) is essential to learning why th at patient's metabolic rate is abnormally low.

To sum up, most patients we've referred elsewhere for metabolic testing have wasted their time and money. We sincerely regret that. We're searching for facilities in other states that provide the correct testing. Meanwhile, we're not referring patients to other facilities. For the patient in another state, this means, of course, a trip to Boulder, Colorado, which we know is inconvenient. But at least by traveling to Boulder, the patient can be sure to get [an evaluation of his/her metabolic status that's as accurate and complete as possible. On another page, we describe how we get accurate measurements of patients' resting metabolic rates.](#)

**March 22, 2004**

**Question:** In your most recent newsletter, you wrote that you [measure a patient's metabolic rate when he or she comes to your clinic](#). My understanding is that metabolism goes on inside cells. Since you canit get inside a patient's cells, how can you measure the rate of metabolism inside them? Also, can't you get a good idea of the metabolic rate from the TSH level?

**Dr. Lowe:** When we say we "measure" a patient's metabolic rate, we're actually referring to a calculation of the rate. We use an instrument called an "indirect calorimeter." What the instrument really measures is how much oxygen the patient consumes at rest. Using the measure of her oxygen consumption, it then calculates her metabolic rate.

Although the "measurement" of the patient's metabolic rate is actually a calculation, and therefore indirect, the calculation is *exceedingly* accurate. The reason is that metabolism in cells proceeds by oxygen-expending reactions. For example, cells break down food substances and release the energy stored in them by combining oxygen to parts of the food substances. This oxygen-combining process, called oxidation, is proportional to the patient's oxygen consumption. Because oxidation in cells and oxygen consumption are proportional, the instrument can accurately calculate the metabolic rate of cells from how much oxygen a patient consumes at rest.

Recent studies show that the precision of indirect calorimetry is remarkable. It is *exquisitely* sensitive to slight changes in a patient's metabolic rate in response to tiny changes in her thyroid hormone dosage. The TSH level *may* reflect changes in the metabolic rate, but only within a TSH range that most doctors consider insignificant. Compared to indirect calorimetry, then, measuring the TSH level isnit a useful way to assess changes in a patient's metabolic rate.

The aim of thyroid hormone therapy should be to provide a patient with normal metabolism. Indirect calorimetry accurately tells us when the patient's thyroid hormone dosage succeeds at that aim. Because of that, doctors should be using the instrument to adjust their patients' dosages ~~o~~not the patients' TSH levels.

[How We Measure Your Resting Metabolic Rate](#)

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