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Rethinking the TSH Test: An Interview with David Derry, M.D., Ph.D.

The History of Thyroid Testing, Why the TSH Test Needs to Be Abandoned, and the Return to Symptoms-Based Thyroid Diagnosis and Treatment

[by Mary Shomon](#)

Almost every conventional discussion of thyroid disease focuses on the use of the Thyroid Stimulating Hormone (TSH) as the diagnostic "gold standard" for thyroid disease. The TSH is used almost exclusively by most conventional physicians as the means of diagnosing thyroid disease, irrespective of symptoms. Typically, if the TSH level is above the normal range, a patient is diagnosed as hypothyroid, and TSH levels below normal range are interpreted as hyperthyroidism. But is the TSH test and the reference "normal range" accurate? *Should* thyroid disease diagnosis be based primarily on this one test? Some experts say no.

Dr. A P Weetman, professor of medicine, wrote in the article "[Fortnightly review: Hypothyroidism: screening and subclinical disease](#)," which appeared in the 19 April 1997 issue of the *British Medical Journal*, the following groundbreaking statement:

". . . even within the reference range of around 0.5-4.5 mU/l, a high thyroid stimulating hormone concentration (>2 mU/l) was associated with an increased risk of future hypothyroidism. The simplest explanation is that thyroid disease is so common that many people predisposed to thyroid failure are included in a laboratory's reference population, which raises the question whether thyroxine replacement is adequate in patients with thyroid stimulating hormone levels above 2 mU/l "

stimulating hormone levels above 2 mIU/L.

In response to Dr. Weetman, David Derry M.D., Ph.D., a thyroid expert and researcher, based in Victoria, British Columbia, responded, saying:

"Why are we following a test which has no correlation with clinical presentation? The thyroidologists by consensus have decided that this test is the most useful for following treatment when in fact it is unrelated to how the patient feels. The consequences of this have been horrendous. Six years after their consensus decision Chronic fatigue and Fibromyalgia appeared. These are both hypothyroid conditions. But because their TSH was normal they have not been treated. The TSH needs to be scrapped and medical students taught again how to clinically recognize low thyroid conditions."

This provocative response was how Dr. Derry came to the attention of many thyroid patients, and interviewer Mary Shomon, About's thyroid guide. In this interview, Dr. Derry shares his fascinating and innovative ideas about why he believes the TSH test needs to be abandoned. This interview was conducted in July of 2000.

Mary Shomon: First, Dr. Derry, can you tell us a little bit about your medical background, and interest in thyroid testing and treatment?

David Derry: I have always been interested in Medical research. I graduated with a Medical Degree from the University of British Columbia, Canada in Vancouver in 1962. I interned at the Toronto General Hospital. From there I went to McGill University and went into a four year program to get my PhD in biochemistry and more specifically in Neurochemistry at the institute set up by Wilder Penfield called the Montreal Neurological Institute in Montreal. In 1967 I graduated with a PhD in biochemistry from McGill. I was hired by the department of Pharmacology at the University of Toronto Medical School as an assistant professor. For five years I did basic biochemical research and taught medical students, dentistry students and pharmacy students. Not long after I arrived in Toronto I was became a Scholar of the Medical Research Council of Canada. That is to say, my salary was paid by The Medical Research Council of Canada to do pure research for five years. At the same time I worked week-ends in charge and the only physician in a large 900 bed psychiatric hospital called the Lakeshore Psychiatric Hospital. Meanwhile about then (1970) I had a rearrangement of my domestic status. I ended up marrying my present wife and by this gained three more children. I had two of my own. All children were between 4 and 9 years old. There was no way that the salary of an assistant professor in Pharmacology at the University of Toronto was going to be able to pay to raise five small children. After the legal aspects had been settled my wife and I, the five children and a large Labrador retriever boarded a 747 for Victoria British Columbia. Within two weeks I started a general practice.

When I came back into General Practice I had in mind a saying I attribute to Dr. Wilder Penfield which was (paraphrasing) "If you listen to a patient carefully the patient will tell you the diagnosis and if you listen even more

carefully and the patient will tell you the diagnosis and if you listen even more carefully they will tell you the most appropriate treatment". Before I went back into practice I had taken courses in interpersonal relationships and how to communicate and listen better. Since I entered General Practice I have taken more courses in personal development. My idea was to learn more and more how to listen carefully and how to get my personality (ego) out of the way of the conversation with the patient. Because I was armed with this approach I developed, I have been able to learn much in the last 28 years in practice.

After about 3-4 years in practice I thought I would start to do my own research. I started with Vitamins. Amongst many other topics, I taught Vitamins at the University of Toronto and when Dr. Linus Pauling's book on Vitamin C and Cancer came out in 1970 I was asked by the Faculty of Medicine to present the essential material of the book to about 300 faculty members and students. Therefore, vitamins, their prophylactic and therapeutic use was a good place for me to start to investigate. So I investigated the use of vitamins for all manner of disease. Eventually after about 10 years I had fairly well exhausted every aspect of the therapeutic use of vitamins I could think of. By then I knew what you could do and couldn't do with vitamins. Most of the patients were only too glad to help me with this and the ones who got better were very grateful. Since then I have slowly over the last 15-20 years developed an interest in thyroid problems. There are reasons for my interest in thyroid that are too long to tell. Gradually I obtained copies of all the relevant thyroid literature back to the 1883 Committee on Myxedema. I have a huge library on the thyroid literature consisting of about 5000 reprints and books. All of the old textbooks I copied and have them in my library for my use. All of this is computerized of course. There are other aspects of my medical and biological training in my CV. ([See Dr. Derry's Biographical Information and Chronological Curriculum Vitae](#))

The consensus of thyroidologists decided in 1973 that the TSH was the blood test they had been looking for all through the years. This was about two years after I started practice. Having been taught how to diagnose hypothyroid conditions clinically I was in a position to watch to see what the relation of the TSH was to the onset of hypothyroidism. What I found was many people would develop classic signs and symptoms of hypothyroidism but the TSH was ever so slow to become abnormal, rise and confirm the clinical diagnosis. Sometimes it never did. Finally I began treat patients with thyroid in the normal manner I was taught. I could not see why I had to wait for the TSH to rise for me to be able to treat them.

The main ingredient of thyroid hormone, which distinguishes it from other molecules of similar size (molecular size), was the element which made thyroid hormone namely iodine. So I did a thorough search of the literature on iodine. This review led me to try to use iodine and thyroid therapeutically. The TSH had caused all research on the therapeutic use of both of these substances to stop dead. My biochemical and pharmacological background

has allowed me to search in areas of the literature that are impossible for a normal physician or even a specialist to explore.

If you remember it was a long time before the medical profession admitted that there were two new diseases to appear in the world that were not there before. Chronic fatigue and fibromyalgia were non-existent before 1980. This is seven years after the 1973 consensus meeting. So where did these two new diseases come from? The symptoms and signs of chronic fatigue and fibromyalgia were described in the literature in the 1930's as one way that low thyroid could be expressed. Treated early it was easily fixed with thyroid in adequate doses. But even then the clinicians had noticed that if a patient has low thyroid (chronic fatigue and fibromyalgia) for too long then it became more difficult to reverse all signs and symptoms regardless of what they were.

Mary Shomon: Why do you think that thyroidologists have decided that the TSH test is the most useful -- or in many cases - the only test for thyroid problems, versus a patient's clinical symptoms? How do you think this has come to be considered the "gold standard" for thyroid diagnosis and management?

David Derry: The thyroidologists have been looking for a reliable test for thyroid function since the beginning of the century. The first important ones were the Basal Metabolic Rate, the cholesterol and the creatine phosphokinase. (CK) . These were used mainly up to about 1960. If you had a high cholesterol in the first half of the century you got thyroid to lower it to normal. Details of using this method of treatment were still described in the 1950's. The Basal Metabolic rate became the fad in the 30s and 40s and almost every office had a machine to measure it. It was quite good but subject to difficulties of interpretation and interference by emotional factors. However it still remains the only test that actually measures the effects of thyroid medication on the human body. In the 1940's radioactive iodine became available from the Tennessee Valley Atomic Energy Complex. Hence the metabolism of iodine could be studied more closely. The radioactive iodine uptake by the thyroid became a frequently used test, which was said to be infallible like all the others when they first arrived. Every time there was a new test it was declared to be reliable for telling if a person was hyperthyroid or hypothyroid, but as with every previous test it turned out to not be clinically applicable in all cases. In the 1960's when I was studying medicine the PBI (Protein bound iodine) was heralded as the only test necessary, when it was low you had hypothyroidism and when it was high you had hyperthyroidism. This was written in some of the textbooks of the time. Eventually this test went the way of the rest -- useful sometimes-- but doesn't always agree with the clinical findings.

Next came the T4 or total thyroxine in the blood that is the free and the

protein bound thyroxine measured together. This was also hailed as far superior to the PBI, but it too went the way of the rest of the tests --as not being reliable enough. Finally the TSH arrived in the late 60s and was boasted about as the final answer. The TSH was not only able to deliver all the thyroid diagnoses but it could be used as well for monitoring therapy. Over the following twenty years the TSH was made more and more sensitive and because of these improvements it was even more thought that it was the total answer for thyroid diagnosis and treatment. However as the TSH was so sensitive to orally-given thyroid hormone it meant literally everyone was going to end up with a low dose by comparison with previous doses. The new doses were about a third of the dose that had been found to be clinically effective for every patient for eighty years prior to the TSH.

The TSH had a ring of scientific rigor for those who have a smattering of knowledge about thyroid metabolism. It was part of the pituitary feed back mechanism for monitoring the output of the thyroid gland. There is no doubt that it does accomplish this job. But unfortunately the TSH value has no clinical correlation except at absolute extremes with the clinical signs or symptoms of the patient. The reasons for this are complex and I only want to discuss one aspect but there are other important factors.

To start with the thyroid metabolism is controlled locally in the tissue by each organ. That is the brain has one mechanism for controlling the amount of thyroid available to the brain but it is different from other tissues such as the liver. There are many mechanisms by which each tissue controls the amount of thyroid hormone which gets into the tissues. But to discuss one: there is an enzyme in the tissue which deiodinates (takes one iodine off the thyroxine T₄) and makes T₃ or triiodothyronine. These enzymes are called deiodinases. Every tissue has different types of deiodinases. To just give you one example: If you starve animals and study the deiodinases in the brain and liver you find that the activity in of the brain deiodinases go up by 10 times while at the same time the liver deiodinases go down--not up. This mechanism is obviously meant to preserve the functioning of the brain under starvation conditions and not metabolize too much thyroid hormone in the liver. Therefore the control of thyroid metabolism is in every individual tissue. The problem with this is-- if a tissue needs more (such as the brain with depression) there is no way for the brain to signal the thyroid that it needs more sent up to it. The thyroid merrily goes on putting out the same amount of thyroid hormone. So the patient can have symptoms related to low thyroid in the brain (for example) but the thyroid doesn't do anything about it. But if you give thyroid hormones in an adequate dose the brain symptoms will disappear. Meanwhile the other tissues and organs adapt to the increased circulating hormones that you have used to fix the brain with. The adaptation of the tissues to different levels of circulating hormones has been shown in the literature.

The symptoms of low thyroid, which are numerous and variably expressed, can be related to any organ or system in the body and partly depends on the person's genes. But because of the all inclusiveness of the TSH medical students are not taught or only superficially taught the symptoms of low thyroid. The TSH was "scientific" and held all the answers to thyroid disease. If you have not lived through several versions of the ultimate test for thyroid then it is harder to grasp this phenomenon.

Mary Shomon: If, as Dr. Weetman suggests, the laboratory's reference range for "normal" TSH includes people who are in the process of developing hypothyroidism, do you feel that the reference range itself should be recalculated?

David Derry: This suggestion agrees with what I have been saying namely that the TSH can lag a long way behind the appearance of low thyroid symptoms. One clear case I remember is a lady who started to lose her hair at age 26 and had lost it all by the time she was 35 but the TSH did not turn up until she was 48. Then her TSH rose very high for the first time. (The TSH was several hundred). She was being treated for a heart condition at the time but when the cardiologist saw the TSH, he said just treat the low thyroid condition and her heart problems will go away. He was right. Her hair has not grown back yet. She has been taking thyroid for about 1 year now. So her TSH lagged her symptoms and signs by 22 years. In some cases the TSH appears never to turn up and confirm the clinical diagnosis.

It is difficult to visualize using the TSH when, as Dr. Weetman has said, people can be low thyroid with a normal TSH. The truth is that there is no relationship between the TSH and how people feel. Dr. Anthony Toft has stated this in the bible of thyroidology Werner and Ingbar's "The Thyroid" in 1991. I have quoted this reference in my response. Dr Weetman has also said in a response on line to the BMJ article of May 2000 article by Denis StJ. O'Reilly on "Thyroid function tests_time for a reassessment" that he thinks that a patient can have a profound hypothyroidism without any signs or symptoms. This is incorrect.

To follow the TSH while you are treating someone for low thyroid is also going to lead to under-treating the patient. The pituitary cells, which have TSH in them, are the most sensitive cells in the body circulating thyroid hormone. Therefore when one treats hypothyroidism by following the TSH and trying to make it normal the pituitary cells are happy but the rest of the body is short-changed by a considerable amount I also mentioned in my response to the same article that the normal dose arrived at by all the best clinicians in the world over 80 years of experience was between 200 and 400 micrograms of Eltroxine. But some need more. Currently treated patients average about 100 micrograms which is about a third of the dose that has been known for a century to help patients return to normal. Long term studies found no difference in mortality between normal people and people taking

round no difference in any disease between normal people and people taking the thyroid at the higher doses. Recent studies have confirmed this opinion. The tail end of this approach of the method of treating hypothyroidism was documented by Professor R. Hoffenberg in the introduction to his two part article on hyperthyroidism in the British Medical Journal 1974. Reflecting on a life-time of treating thyroid patients, he mentions that his personal record of amount of thyroid he needed to give to a patient to make them feel right was 29 grains of desiccated thyroid. which represents approximately 1700 mgs of desiccated thyroid which would be equal to about 2900 micrograms of Eltroxine. This highly-respected thyroidologist had spent a lifetime treating thyroid patients must have prepared the paper and had it accepted during 1973 when the consensus meeting on the TSH occurred.

This all means even if the chronic fatigue patient does have an abnormal TSH the treatment will be inadequate to make them well again. The clinicians of the past (before the TSH) were astute and very observant and were able to diagnose and treat hypothyroidism correctly without the TSH for 80 years-- why do we need it now? They would be aghast at the total missing of the diagnosis of chronic fatigue and fibromyalgia.

The treatment of thyroid cancer before the TSH involved giving the maximally tolerated dose of thyroid in order to stop the cancer. It was termed then a sub-toxic dose. That is the dose of thyroid would be raised until some toxic symptoms occurred then the dose would be lowered slightly to remove the symptoms such as sweating too much or tachycardia. The present treatment of thyroid cancer patients only get enough to suppress the TSH which is usually a much lower amount. Nothing untoward happened to these patients of the era before the TSH because of this higher thyroid dose.

Mary Shomon: You indicated that you feel chronic fatigue and fibromyalgia are both hypothyroid conditions. There are some physicians who feel that these two conditions are manifestation of difficult to diagnose hypothyroidism, and yet other studies claim there is no relationship. Can you explain why you feel there is a connection among these conditions?

David Derry: For many years the literature (before the TSH) supported the fact that if your symptoms responded to thyroid hormone you were low thyroid but especially if when you took the person off the thyroid and their symptoms returned. My own patients who develop chronic fatigue or fibromyalgia I treat them with thyroid and all --and I mean all-- of their symptoms disappear. If I stop the thyroid or if they stop it for some reason all the symptoms start to slowly come back over the following months. You might ask do I do thyroid function tests? The answer is yes if for no other reason that I am curious to know what they look like in the face of the patient's obvious clinical diagnosis. The other patients who come to me from outside my practice respond roughly in proportion to how long they have had

outside my practice respond roughly in proportion to how long they have had it. But I have had lots of pleasant surprises of people badly disabled by fibromyalgia or chronic fatigue for six years or more who slowly over 6 months to a year their symptoms completely disappear. It is of course a delight to see this happen.

Mary Shomon: Do you feel that TSH - or TRH, T4/T3, antibodies, or Reverse T3 - tests have any place in thyroid diagnosis and management, or do you believe that diagnosis and treatment should be solely based on symptoms.

David Derry: One place that TSH has been useful is testing new-born babies. The TSH which is backed up by the free T4 or the Total T4 tells you quickly that the baby has a serious problem which must be treated immediately. This does not say that the TSH is infallible in this instance but at least when it is abnormal then you know you have a serious problem.

A phenomenal number of thyroid function tests are ordered by physicians today but it is unlikely that it has helped that much as the physicians have been ignoring the symptoms of low thyroid which so many patients complain about.

Mary Shomon: What are the most common clinical hypothyroidism symptoms you've found most useful in making a diagnosis?

David Derry: I gave a lecture on thyroid about three years ago and discussed this topic. The signs and symptoms list continues to grow as I learn more. Most people will have some form of fatigue but there is a group that are high output (read will-power) and low thyroid. These patients are not always thin. A good example I had was a 19-year old ballet dancer, while dancing for a national Ballet company, started to see a counselor for depression. She continued to dance with the company. There is no way a person that physically healthy and that age with no previous history should be depressed except by low thyroid. But suspicions would be heightened when you know her mother and her sister have low thyroid conditions. Her TSH was raised above normal but the cure was the same regardless of whether the TSH was abnormal or not. She has been completely well since her low thyroid was corrected. All ballet dancers have enormous drive and self-control therefore they can ignore many symptoms and carry on. So people with strong will power can ignore many symptoms and signs for a long time.

To quote Dr. George Crile on hypothyroidism from his textbook in 1932 on The thyroid and its diseases. "In the advanced stage of the disease the patient may complain of almost any symptom which can result from a low metabolism. A summary of the literature discloses that symptoms referable to every organ in the body have been attributed to thyroid deficiency and have been relieved by the administration of thvroid extract." I now have a huge

organized list of hypothyroid symptoms which I will not burden you with. Initially it was made for my lecture but I have been adding to it slowly since as I witness new signs and symptoms disappear with therapy.

People who have had terrible childhood experiences (sexual abuse, physical abuse, personal tragedies etc) for whatever reason have altered thyroid metabolism. They are more complex to treat. They are different from everyone else biochemically and pharmacologically. The blame for most of their residual difficulties is not with their brains and minds but with their chemistry. I believe also other areas of their biochemistry are not normal. I don't think this has been generally recognized yet.

Mary Shomon: What type of thyroid hormone replacement therapy do you favor? Levothyroxine, levothyroxine plus T3, or natural thyroid hormone replacement, and why?

David Derry: I use any of the above. In Canada we have only Eltroxine (levothyroxine) or desiccated thyroid (Parke-Davis). T3 is available through specialty pharmacies but is not as readily available as in the US. If I don't get the response that I am looking for, I will often switch either way in order to try and make the patient better.

Mary Shomon: Are you practicing currently? How can patients arrange to see you? Do you do phone consults?

David Derry: I have no intentions of retiring in the near future. Since I gave my two lectures three years ago on Breast cancer and Thyroid I have had close to 2000 new patients. Fortunately for me I have been able to help most of them so I don't have to go on seeing them. A fair number of patients come quite far. I have a bunch of patients who come from Alberta and one of these is a young lady from Calgary who flies to Victoria for each of her appointments. All who want to come can do so by booking through the office, at 250 478-8388. I would be too flooded to answer much over the phone. Also I am sure I couldn't diagnose and or treat anyone without meeting with them I need to follow people for several months after seeing them-- but not often after that--as the thyroid works so slowly that you have to give it time.

At present I am writing a book on breast cancer. Hopefully it will be finished by year-end or before. After the breast cancer book I will write one on this topic.

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[See Dr. Derry's Biographical Information and Chronological Curriculum Vitae](#)

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