

# **Consent: Customary Practice Versus Prudent Patient From The Perspective Of Mimics of Hypothyroidism**

by Eric K. Pritchard, M.Sc.

**Quoting a UK patient:** *"The ignorance, arrogance and incomprehension of the medical doctors I have been subjected to in my search for diagnosis and treatment leaves me incandescent with rage. Even as a qualified health professional working for a major DGH, I remain powerless to prevent the cumulative long term health risks associated with lack of treatment; I am voiceless, neutered, patronised, and crawling day-to-day through what used to be my vital and colourful life. I would give everything I have for an open minded and creative diagnostician, and more for a little compassion, but this seems to be entirely beyond the capability of modern medicine. God help us all."*

## **Abstract / Introduction**

Customary practice and prudent patient consent criteria are substantially different in the diagnosis and treatment of the mimics of hypothyroidism (maladies with the same symptoms but having different causes). Consequently, patients within this niche of healthcare are dissatisfied with customary practice because it ignores these mimics. But, prudent patients know some or all of the following facts:

1. Some patients afflicted with the mimics of hypothyroidism do get proper care from brave, ethical, and scientifically astute physicians. These fortunate patients are counterexamples to the customary practice of treating mimics of hypothyroidism.
2. The Quality Assessed Life-Years (QALY) of the customary practice treatment of the mimics of hypothyroidism is substantially lower than that of the counterexamples.
3. Human rights, medical ethics, official policies, and case law find error in the customary practice of ignoring the suffering associated with the mimics of hypothyroidism.
4. The language describing the greater thyroid realm is not clear. It offers little or no distinction between thyroid gland abnormalities and abnormalities caused by other functions in the greater thyroid system that produce mimics of hypothyroidism.
5. The assumptions and analyses that support the customary practice as it is applied to mimics of hypothyroidism are junk science. Endocrinology should have known this and its implication for chronic suffering by the victims of the mimics.

Governments, which were formed for the mutual protection of its citizens, have relinquished medical sovereignty and offer little, if any, protection against the abusive human frailties within medicine. There are no checks upon the masters of medicine.

## QUESTION:

*Can medical practice, with existing counterexamples and without scientific basis, dictate the abuse of patients?*

### TABLE OF CONTENTS

<b>Section 1 The Primary Argument</b>	-	-	-	-	-	-	-	3
Your Greater Thyroid Experience with Customary Practice	-	-	-	-	-	-	-	3
Your Greater Thyroid Experience with Prudent Practice	-	-	-	-	-	-	-	5
QALY Analysis of Counterexample Medical Interventions	-	-	-	-	-	-	-	8
GMC Ethical Standards and Human Rights are Ignored	-	-	-	-	-	-	-	11
Guidelines are Mandatory	-	-	-	-	-	-	-	15
The Importance of Counterexamples and Sir Karl Popper	-	-	-	-	-	-	-	16
Primary Argument Conclusions	-	-	-	-	-	-	-	17
<b>Section 2 - Secondary Arguments</b>	-	-	-	-	-	-	-	18
Endocrinology vs. Counterexamples	-	-	-	-	-	-	-	18
The History of Thyroid Related Medical Science	-	-	-	-	-	-	-	22
Confusing Linguistics	-	-	-	-	-	-	-	27
Plain Text Interpretation	-	-	-	-	-	-	-	29
Counterexamples to and Critique of Confirming Studies	-	-	-	-	-	-	-	30
Incomplete Differential Diagnosis and Other Assertions	-	-	-	-	-	-	-	33
Alleged Dangers of T <sub>3</sub> Therapies	-	-	-	-	-	-	-	35
Conclusions	-	-	-	-	-	-	-	36
<b>Appendices</b>								
Appendix A - Stories of Counterexamples	-	-	-	-	-	-	-	37
Appendix B - Ignoring Medical Ethics	-	-	-	-	-	-	-	45
Appendix C - Support for the Daubert Rule in the UK	-	-	-	-	-	-	-	48
Appendix D - Definitions	-	-	-	-	-	-	-	50

## Section 1 The Primary Argument

Section 1 takes a direct logical path to the invalidity of the application of hypothyroidism medical practice guidelines to the mimics of hypothyroidism. This argument is based upon patient counterexamples to the absolute guideline proscription of the hormone replacement required by these mimics. Further arguments are raised in Section 2. Both are supported by the Appendices.

### Your Greater Thyroid Experience with Customary Practice

Your medical experience with your symptoms of hypothyroidism will most often be successful. But it may also be unsuccessful and even abusive. Your symptoms will prompt your physicians to follow a medical practice guideline and investigate your thyroid-related hormone levels with blood tests, i.e. thyroid function tests. [1] Usually, only one hormone is tested, the thyroid-stimulating hormone (TSH). If your TSH level is within its "normal" reference range then you are judged to have a healthy thyroid. If your TSH is high, then a further test is done for your free, unbound thyroxine level ( $fT_4$ ). If that is low, then you are declared to be hypothyroid and treated with the only recommended therapy, levothyroxine sodium ( $T_4$ ). The testing of your TSH and the adjustment of your levothyroxine sodium dose is done repeatedly until your TSH level is "normal" and then rechecked annually.

#### Symptoms of Hypothyroidism [1-3]

Extreme Tiredness, Fatigue, Weight Gain, Lethargic, Sluggish, Joint & Muscle Pain, Sleep Problems, No Motivation, Depressed, Cold Intolerance, Mood Swings, Lack of Stamina, Weak, Brittle, Ridged Nails, Memory Loss, Foggy Mind, Impaired Concentration, Dry Skin, Sore Skin, Scaly Skin, Body Hair Loss, Outer Eyebrow Loss, Lifeless Hair, Poor Appetite, Constipation, Hoarse Voice, Tingling of the Hands (Carpal Tunnel Syndrome), Abnormal Periods, Deafness, Slow Reflexes, Slow Movements, Puffy Face, Slow Pulse Rate, and Enlarged Thyroid Gland

This simplicity works in 80+% of the cases with a positive diagnosis. [4] Endocrinology has accepted this low success rate, has declared hypothyroidism a trivial disease, and will do nothing further, except to offer excuses for their failure and your chronic suffering. Physicians are instructed by the endocrinology establishment to blame the inadequacies of medicine by declaring that you have *nonspecific symptoms* [5] whose causes, of course, are unknown. Or, they might blame you for imagining your continued suffering by blaming you for having *functional somatoform disorders*. [6] Or, they might just blame your old age. These excuses are quite unfortunate for the 13+% of treated patients, [4] who are not treated properly and another approximate 6% of the population who are not diagnosed properly. [7]

These high failure rates have produced a considerable public interest in how they might regain their active, attractive lives. This interest spread to the internet [2,8] where people wrote of their sufferings and of discoveries in medical science literature. This certainly upset some endocrinologists [6] as indicated a responding title, *Whose Thyroid Hormone Replacement is it Anyway?*

Two website forum owners surveyed their members to produce the following excerpts of their findings:

**Table 1 Symptom Prevalence Among Failed Patients**

<b>Symptom</b>	<b>Survey</b>	<b>Thyroid Patient Advocacy Sheila Turner (n=1500) [2]</b>	<b>Thyroid About Mary Shomon (n=907) [3]</b>
Extreme Tiredness / Fatigue		85.9%	91.7%
Weight Gain / Cannot Lose It		81.9%	64.5%
Lethargic / Sluggish		72.4%	62.1%
Joint & Muscle Pain		67.0%	50.8%
Sleep Problems		64.5%	46.1%
No Motivation / Depressed		63.4%	45.4%
Cold Intolerance		62.5%	39.7%
Mood Swings		60.3%	45.2%
Lack of Stamina / Weak		56.9%	47.7%
Brittle & Ridged Nails		53.7%	32.4%
Memory Loss / Foggy Mind		53.7%	58.3%
Dry, Sore, Scaly Skin		50.1%	31.3%

### **Endnotes - Customary Practice**

1. UK Guidelines for the Use of Thyroid Function Tests, The Association for Clinical Biochemistry, British Thyroid Association, British Thyroid Foundation, 2006, [www.british-thyroid-association.org/guidelines.htm](http://www.british-thyroid-association.org/guidelines.htm)
2. Turner S, Hypothyroidism Patient Survey Results, Thyroid Patient Advocacy-UK, [http://www.tpa-uk.org/tpauk\\_survey.pdf](http://www.tpa-uk.org/tpauk_survey.pdf)
3. Shomon M, First Large Scale Quality of Life Survey of Thyroid Patients, Thyroid-info.com, 2002-2003, [http://thyroid.about.com/library/weekly/aa\\_surveysumm.htm](http://thyroid.about.com/library/weekly/aa_surveysumm.htm)
4. Saravanan P, Chau F, Roberts N, Vedhara K, Greenwood R, Dayan CM, 2002, Psychological Well-Being in Patients on "Adequate" Doses of L-Thyroxine Results of a Large, Controlled Community-Based Questionnaire Study, *Clinical Endocrinology*, 2002, 57: 577-585
5. *Wilson's Syndrome*, American Thyroid Association, Nov 1999 updated May 2005
6. Weetman AP, Whose Thyroid Hormone Replacement is it Anyway? *Clin Endocrinol*, 2006;64(3):231-233
7. Goldberg M, The Case For Euthyroid Hypometabolism, *Am J Med Sc* October, 1960 pgs 479-493

## Your Greater Thyroid Experience with Prudent Practice

Your thyroid-related experience with practice consistent with the prudent patient standard (prudent practice) continues if there are continuing symptoms. This practice notes the entirety of the greater thyroid system as illustrated in the following table. The physiological flow is from the top to the bottom with some regulatory feedback loops that go back up. Note: Customary practice ignores all functions past the thyroid gland. It offers no diagnostics or therapies.

**Table 2 - The Greater Thyroid System**

<b>Gland / Organ</b>	<b>Input / Media</b>	<b>Output / Media</b>	<b>Function</b>
The Brain		Signals from the brain / nerves	This is the beginning of the greater thyroid system
Hypothalamus	Signals from the brain / nerves	Hormone: TRH	Convert Brain Commands to Hormone Commands
Pituitary	TRH, T <sub>4</sub> , T <sub>3</sub> / Blood	TSH / Blood	Regulate the thyroid gland w/ Feedback of T <sub>4</sub> & T <sub>3</sub>
Thyroid Gland	TSH, Iodine / Blood	T <sub>4</sub> , some T <sub>3</sub> , and Potentially Antibodies / Blood	Produce all of the requirement by the body for T <sub>4</sub> (a prohormone) and 20% of the needed active hormone, T <sub>3</sub>
<b><i>Customary Practice Laboratory Tests</i></b>	<b>TSH, T<sub>4</sub>, and Potentially Antibodies / Blood</b>	<b>Values to compare with "normal" reference ranges</b>	<b>The thyroid gland function test effectively measures only this far through the greater thyroid system.</b>
Peripheral Metabolism	T <sub>4</sub> , Enzymes / Blood	T <sub>3</sub> , rT <sub>3</sub> / Blood	Produce 80% of the requirement by the body for the active hormone T <sub>3</sub> and Regulate T <sub>3</sub> by producing rT <sub>3</sub> if T <sub>3</sub> levels are excessive
Peripheral Cellular Hormone Reception	T <sub>3</sub> / Blood	T <sub>3</sub> / Inner Fluids of Cells	Pass T <sub>3</sub> through the walls of the cells for use by the cells' nuclei
Peripheral Cells	T <sub>3</sub> , Other Nutrients / Cells' Inner Fluids	Waste / Blood	Perform that function of the cells and produce symptoms
Clearance	TRH, TSH, T <sub>4</sub> , T <sub>3</sub> , T <sub>2</sub> , T <sub>1</sub> , sulphates, Amines of T <sub>1</sub> -4 glucuronides, waste / Blood	TRH, TSH, T <sub>4</sub> , T <sub>3</sub> , T <sub>2</sub> , T <sub>1</sub> , sulphates Amines of T <sub>1</sub> -4, glucuronides, waste / Urine or Feces	Cleanse the body & regulate the circulating hormones
Our View		Body and brain activity, body temperature, etc.	Logically, the proper measurement of the greater thyroid system should be at the output.

Although there are many contributing researchers and papers describing the greater thyroid system (noted in chapters below), two papers stand out as demonstrations of the limits of the customary thyroid practice. First, Drs. Baisier, Hertoghe, and Eeckhaut (*Thyroid Insufficiency? Is Thyroxine the Only Valuable Drug?*) studied the failures of the customary practice of endocrinology and found that these subjects had the same collection of symptoms as patients with deficient thyroid gland secretion (the proper definition of *hypothyroidism*). They found an evaluation of eight *nonspecific symptoms* is a good clinical diagnostic. They also found diagnostic information in the subjects urine that correlated better with the symptoms. And finally, in a followup study, they treated these failed subjects with desiccated thyroid successfully. [1]

Second, Dr. Marshall Goldberg, discovered euthyroid hypometabolism in 6% of his 500 subjects. They had the list of symptoms of hypothyroidism but were not found to have any deficiency of the secretion by the thyroid gland. [2,3] Thus, Dr. Goldberg explained the existence of symptoms in spite of a thyroid gland function test (a.k.a. TFT) within reference ranges.

A famous pioneer, Dr. Broda Barnes, must be mentioned for his dedication to hypothyroidism and its mimics. [4] He found that people were substantially healthier, had fewer heart attacks, etc., when they did not present symptoms of hypothyroidism. His study of heart attack rates among those he treated was far lower than the famed Framingham study. [5]

The symptoms of hypothyroidism can also be created by deficient adrenal function. [6] Dr. John Lowe produced a huge text covering these and other subjects. [7]

Prudent practice is more successful because it considers more, if not all, of the causes of the symptoms of hypothyroidism. Since when examining the patient, it is best to examine the whole patient, the victims of the mimics of hypothyroidism need to be examined more fully. When they are treated properly instead of improperly, they become counterexamples to the customary practice of diagnosing and treating the symptoms of hypothyroidism as if the symptoms were only caused by deficient secretion by the thyroid gland.

Consent from prudent patients is supported by these policy statements from UK authorities:

"For consent to be valid, it must be given voluntarily by an *appropriately informed* person who has the capacity to consent to the intervention in question. Acquiescence, where the person does *not know* what the intervention entails, is not 'consent'." [8] (emphasis added)

"You have the right to be given information about your proposed treatment in advance, including any significant risks and *any alternative treatments which may be available*, and the risks involved in doing nothing." [9] (emphasis added)

"You have the right to make choices about your National Health Service (NHS) care and to information to support these choices. The options available to you will develop over

time and depend on your individual needs." [9]

"To give valid consent, the person needs to understand the nature and purpose of the procedure. *Any misrepresentation of these elements will invalidate consent.*"[8]  
(emphasis added)

Consent is required by case law, too. In *Chester v Afshar*. [8,10] The House of Lords ruled that a failure to warn a patient of a risk of injury inherent in surgery denies the patient the chance to make a fully informed decision. The House of Lords held that it is advisable that health practitioners give information about all significant possible adverse outcomes. The ruling in *Re T (Adult)* [11] stated "A patient's consent to a particular treatment may not be valid if it is given under pressure or duress exerted by another person."

Prudent practice is also supported over customary practice by case law in *Bolitho v City and Hackney Health Authority* [12] as it adds a judicial facet to the *Bolam* test. In *Bolitho*, the court declared that it was not bound by evidence from a body of experts who genuinely believe that a practice conformed to sound medical practice. The court requires further evidence that the practice has a logical basis, and that the defendant practitioner has weighed up the benefits and risks.

Unfortunately, in spite of stated policy and case law, prudent patient consent is not practiced or enforced. The suffering from mimics of hypothyroidism continues virtually unabated under the abusive customary practice which ignores the second half of the greater thyroid system, Table 1, above.

## **Endnotes Prudent Practice**

1. Baisier, W V, Herto ghe, J., Bee khaut, W., Thyroid Insufficiency? Is Thyroxine the Only Valuable Drug?, *J Nutr and Environ Med*, September 2001, 11(3):159-166
2. Goldberg M, The Case For Euthyroid Hypometabolism, *Am J Med Sc* October, 1960 pgs 479-493
3. Goldberg M, Dagnosis of Euthyroid Hypometabolism, *Am J Obst & Gynec*, 81(5): 1053-1058, 1961
4. Barnes, B MD, *Hypothyroidism: The Unsuspected Illness*, Harper & Row, 1976
5. Barnes, B MD, *Hypothyroidism: The Unsuspected Illness*, Harper & Row, 1976, pg 179
6. Federal Drug Administration NDA 10-379 for Cytomel®
7. Lowe JC, *The Metabolic Treatment of Fibromyalgia*, McDowell Publishing Company, 2000
8. Reference guide to consent for examination or treatment, Department of Health, July 2009
9. Section 2a of the NHS Constitution, January 2009
10. *Chester v Afshar* [2004] UKHL 41
11. *Re T (Adult)* [1992] 4 All ER 649 as cited by the General Medical Council in *Regulating Doctors, Ensuring Good Medical Practice Consent guidance: Legal Annex*
12. *Bolitho v City and Hackney Health Authority* [1997] 4 All ER 771.

## A QALY Analysis of Counterexample Medical Interventions

The Quality Adjusted Life Years (QALY) analysis can definitively indicate if a medical intervention is reasonable and cost effective. The QALY analysis of the thyroxine-only therapy in a counterexample situation has a QALY analysis that shows that the levothyroxine-only intervention should not be done at any cost.

Technically, a QALY analysis [1] is the difference of two quality-of-life assessments. Each assessment is the sum of annual values that range from zero for death and one for good health. One assessment is with the proposed medical intervention and the other is without that intervention. The difference between these figures is the overall QALY figure. Obviously, if there is no intervention, the QALY figure is zero. If the medical intervention improves life, the QALY figure is positive. And if the intervention reduces the quality of life, the QALY figure is negative. In practice, the QALY figure is multiplied by the annual worth of life and that product compared with the cost of the intervention. If intervention does not cost that much, the intervention is performed. Obviously, if the QALY produces a zero or negative results, the intervention should not be done. If it is done anyway, rightfully, the abused patient should be compensated accordingly. Consequently, the QALY views of two counterexample cases are particularly interesting:

Patient S has been prescribed natural desiccated porcine thyroid extract for some years because all of the other therapies relevant to the symptoms of hypothyroidism did not manage her chronic and debilitating symptoms. However, physicians are generally not willing to prescribe any triiodothyronine ( $T_3$ ) containing hormone replacement since either they are not recommended or they are proscribed by guidelines. [2-10] The advent of the Royal College of Physicians, et. al. guideline *The Diagnosis and Management of Primary Hypothyroidism*, [2] has further reduced the numbers of physicians willing to prescribe thyroid extract or any  $T_3$  containing hormone replacement with its unquestionable ban or proscription. Nominally, her case has already demonstrated that she does not have primary hypothyroidism only, yet statements in the conclusion of this guideline [2] drive physicians to deny new prescriptions for thyroid extract. By her own history, only through successful treatment with thyroid extract, we know that her QALY figure, if denied desiccated thyroid therapy, would be negative because her life would change from active and fulfilling to unbearable.

Patient K was examined for thyroid deficiencies more than 40 years ago. She was consistently told that she did not have a thyroid problem. It was just a little low. [12] One day she fainted while standing and broke her leg in two places. However, she was so weak that she could not lift her cast and had to stay in the hospital until she could. An internist saw her textbook look of hypothyroidism and treated her successfully with  $T_3$ . She regained enough strength to be discharged in a mere ten days. Her physician claimed that she was quite lucky that she did break her leg because she would have died shortly without this treatment. Consequently, her pretreatment QALY index was undoubtedly less than one. The physician prescribed liothyronine sodium ( $T_3$ , one of the currently banned/boycotted hormone replacements). In retrospect, her post treatment QALY index was greater than 40 as she is still quite alive and in

good health. So if the present guidelines were followed, they would have killed her. By doing proscribed diagnostic (clinical observation only) and prescribing one of the proscribed hormone replacements the QALY index went up more than 40 points.

But years later, Patient K was forced to find another physician. This physician applied the philosophy of the present guidelines, and prescribed levothyroxine sodium only. Soon she suffered with the symptoms of hypothyroidism again. Fortunately, she persuaded her physician to prescribe what had worked in the past, liothyronine sodium (T<sub>3</sub>). She responded rapidly. Therefore, Patient K demonstrated that rigid adherence to hypothyroidism guidelines reduced her QALY index and rational departures from the guidelines raised it.

NOTE: Patient K demonstrates all three types of counterexamples:

1. The failure of the T<sub>4</sub>-only therapy and the subsequent success of a T<sub>3</sub> therapy.
2. The success of a T<sub>3</sub> therapy and subsequent failure of the T<sub>4</sub>-only therapy.
3. The failure of guideline-prescribed diagnostics to identify the cause of the symptoms of hypothyroidism and the subsequent success of a T<sub>3</sub> therapy.

There are other QALY considerations, for example: [13-19] Hypothyroidism, and presumably its mimics, produce numerous chronic and recurring health problems [11-21] ranging from headaches and colds to great killers, such as heart attacks and diabetes, which significantly impact pre-treatment QALY. Dr. Barnes did a study of his heart attacks in his patients [21] and reported that proper treatment with desiccated thyroid reduced heart attacks far below the Framingham study. His study group, treated with thyroid extract had only four heart attacks. A Framingham group of the same size and duration would have had 72 ([21], page 180). Further, dropouts from the Barnes study had high heart attack rates.

The stories of other counterexamples are in Appendix A. More counterexamples exist as subjects of studies [22-24] and many of the studies cited herein.

## Endnotes QALY

1. Sassi F, Calculating QALYs, Comparing QALY and DALY Calculations, *Oxford University Press & London School of Hygiene and Tropical Medicine*, 2006.
2. The Diagnosis and Management of Primary Hypothyroidism, Royal College of Physicians, 2008
3. UK Guidelines for the Use of Thyroid Function Tests, The Association for Clinical Biochemistry, British Thyroid Association, British Thyroid Foundation, 2006, [www.british-thyroid-association.org/guidelines.htm](http://www.british-thyroid-association.org/guidelines.htm)
4. Vanderpump MPJ, Ahlquist JAO, Franklyn JA, et al., Consensus Statement for Good Practice and Audit Measures in the Management of Hypothyroidism and Hyperthyroidism, *BMJ*, August 1996
5. Baskin HJ, MD, Medical Guidelines for Clinical Practice for the Evaluation and Treatment of Hyperthyroidism and Hypothyroidism, *Am Assoc Clin Endocrinol*, 2002, Rev 2006
6. Levy EG, Ridgway EC, Wartofsky L, Algorithms for Diagnosis and Management of Thyroid Disorders, [www.thyroidtoday.com](http://www.thyroidtoday.com) 2004.
7. The American Thyroid Association provides links to several hypothyroidism related guidelines: *Use of Laboratory Tests in Thyroid Disorders*, *Treatment Guidelines for Patients with Hyperthyroidism and Hypothyroidism*, and *Guidelines for Detection of Thyroid Dysfunction*.
8. Levy EG, Hypothyroidism Treatment Failure: Differential Diagnosis, [www.thyroidtoday.com](http://www.thyroidtoday.com) 2004.

9. Garber JR, Hennessey JV, Lieberman JA, Morris CM, Talbert RI, Managing the Challenges of Hypothyroidism, *Supplement to J of Fam Pract*, 2006, [www.jponline.com](http://www.jponline.com)
10. Kaplan MM, Clinical Perspectives in the Diagnosis of Thyroid Disease, *Clin Chem*, 1999, 45:8(B) 1377-1383
11. Starr, Mark MD, *Hypothyroidism Type 2*, Mark Starr Trust, Columbia, MO, 2005
12. As we learned from Goldberg M, The Case For Euthyroid Hypometabolism, *Am J Med Sciences*, October 1960, pg 479-493, patient K was really suffering from euthyroid hypometabolism.
13. Nikoo MH, Cardiovascular Manifestations of Hypothyroidism, *Shiraz E-Medical J*, 2(1) <http://www.sum.s.ac.ir/semj/vo12/jan2001/hypoathy&heart.htm>
14. Hak AE, Pols HAP, Visser, TJ, et al., Low Thyroid Function Without Symptoms as a Risk Indicator for Heart Disease in Older Women, *Ann of Intern Med*, 15 Feb 2000, 132(4):270-278
15. Camacho PM, Dwarkanathan AA, Sick Euthyroid Syndrome, *Postgraduate Medicine*, April 1999, 105(4)
16. Canaris GJ, Manowitz NR, Mayor G, Ridgway EC, The Colorado Thyroid Disease Prevalence Study, *Arch Intern Med*, Feb 28, 2000, 160(4)
17. *Thyroid Problems Increase Risk of Heart Disease and Death*, American Thyroid Association, Oct 1, 2004
18. Kvetny J, Heldgaard PE, Bladbjerg EM, and Gram J, Subclinical Hypothyroidism is Associated with a Low-Grade Inflammation, Increased Triglyceride Levels, and Predicts Cardiovascular Disease in Males Below 50 Years, *Clin Endocrinol*, August 2004, 61(2):232
19. Iervasi G, Pingitore A, Landi P., et al., Low-T<sub>3</sub> Syndrome A Strong Prognostic Predictor of Death in Patients With Heart Disease, *Clin Physiol Inst*, American Heart Association ©2003
20. Lowe JC, *The Metabolic Treatment of Fibromyalgia*, McDowell Publishing Company, 2000
21. Barnes, B MD, *Hypothyroidism: The Unsuspected Illness*, Harper & Row, 1976
22. Baisier, W V, Hertoghe, J., Bee khaut, W., Thyroid Insufficiency? Is Thyroxine the Only Valuable Drug?, *J Nutr and Environ Med*, September 2001, 11(3):159-166
23. Goldberg M, The Case For Euthyroid Hypometabolism, *Am J Med Sc* October, 1960 pgs 479-493
24. Goldberg M, Dagnosis of Euthyroid Hypometabolism, *Am J Obst & Gynec*, 81(5): 1053-1058, 1961

## **GMC Ethical Standards and Human Rights are Ignored**

### **General Medical Council (GMC) Standards of Ethics [1]**

1. Make the care of your patient your first concern
2. Protect and promote the health of patients and the public
3. Provide a good standard of practice and care
  - a. Keep your professional knowledge and skills up to date
  - b. Recognise and work within the limits of your competence
  - c. Work with colleagues in the ways that best serve patients' interests
4. Treat patients as individuals and respect their dignity
  - a. Treat patients politely and considerately
  - b. Respect patients' right to confidentiality
5. Work in partnership with patients
  - a. Listen to patients and respond to their concerns and preferences
  - b. Give patients the information they want or need in a way they can understand
  - c. Respect patients' right to reach decisions with you about their treatment and care
6. Be honest and open and act with integrity
  - a. Act without delay if you have good reason to believe that you or a colleague may be putting patients at risk
  - b. Never discriminate unfairly against patients or colleagues
  - c. Never abuse your patients' trust in you or the public's trust in the profession.

Endocrinology, regarding the patient with mimics of hypothyroidism, generally violates ethics statement numbers 1, 2, 3a, 3b, 4a, 5a, 5b, 5c, 6a, and 6c. Nonetheless, the GMC enforces the dictates of endocrinology, in spite of also being in violation of the many statements of medical ethics discussed in Appendix B and of Human Rights, below. Victims of mimics are not the first concern, avoiding of GMC hearings is. Consequently, the health of these victims is not promoted.

The physiology of mimics is not known by most physicians, who then work outside of their competence. Caught in the impossibility of caring for the patient, the physician often treats patients rudely and does not listen to them. Certainly, the information on mimics is not forthcoming and there is no offer of treatment for these mimics. Suggestions for the proper care for the continuing suffering from mimics of hypothyroidism are dismissed. Since most of the physicians are abusing the trust of their patients with mimics, there are no complaints of others doing the same. Thus, in the case of patients suffering from mimics of hypothyroidism, physicians routinely violate 10 of the 13 standards. But ironically, the GMC claims this:

*The purpose of the General Medical Council (GMC) is to protect, promote and maintain the health and safety of the public by ensuring proper standards in the practice of medicine. [2]*

Counterexamples demonstrate that the GMC does not foster good medical practice with regard

to the mimics of hypothyroidism, such as Chemically Euthyroid Hypometabolism (CEH). In fact, the GMC has acted [3] and threatens to act against their entitlement to good healthcare. It does not promote the high standards of medical ethics with regard to those with mimics of hypothyroidism. And it does not promote the high standards of medical education in the post thyroid realm as physicians are not so trained. [4] In spite of the medical science being established 40 years ago, the Royal College of Physicians does not recommend the training of physicians in mimics of hypothyroidism such as the post thyroid deficiencies of deficient peripheral metabolism, deficient peripheral cellular hormone reception, or deficiencies in supportive chemicals of these functions. [5]

## **Human Rights Acts of 1998 and 2009**

Contrary to Human Rights Act of 1998 and 2009 there is an overwhelming lack of any aspect of Fairness, Respect, Equality, Dignity, or Autonomy (FREDA) in the diagnosis and treatment that patients with continuing symptoms of hypothyroidism, i.e., symptoms of Chemically Euthyroid Hypometabolism, receive. The lack of these attributes is listed below.

### **1. Lack of Fairness**

- a. Ignoring medical science and medical evidence and diagnostic protocols lead to unfair treatment of patients suffering with mimics of hypothyroidism. Evidence-based Medicine and Differential Diagnostic protocols then demand consideration of these post thyroid mimics. Ignoring these mimics is not fair and violates informed true consent and any prudent patient protocol.
- b. Thus, the endocrinology establishment contravenes the standards for Professional Diligence and materially distorts the choices of violated patients.
- c. Poor standard practice cannot amount to an acceptable standard even if it is a customary practice. [6,7]
- d. As demonstrated by counterexamples, the effective boycott of all T<sub>3</sub>-containing hormone replacements is not fair to those who need it and for those whose condition demands it.
- e. Contrary to the standard of care for medical practice guidelines, [5] the definition for the critical term *hypothyroidism* has been unfairly and improperly omitted. [8]

### **2. Lack of Respect**

- a. Medicine does not respect patients when it falsely claims that only levothyroxine sodium relieves the symptoms of hypothyroidism and effectively blaming the patient when it does not. [9,10] Although medicine should recognize other deficiencies, they are effectively prohibited from consideration.
- b. The denial of available and indicated therapy shows a lack of respect for the suffering patient.
- c. Since there are no recognized diagnostics for mimics of hypothyroidism, physicians culpably attribute blame to the patient.
- d. Medicine demonstrates its lack of respect by not investigating the causes it fails to treat, i.e. 13+% of those treated for hypothyroidism. [11]

### **3. Lack of Equality**

- a. The mimics of hypothyroidism are over included with thyroid gland deficiencies.



- [www.thyroidscience.com](http://www.thyroidscience.com) click on *debate*.
9. Weetman AP, Whose Thyroid Hormone Replacement is it Anyway? *Clin Endocrinol*, 2006;64(3):231-233
  10. *Wilson's Syndrome*, American Thyroid Association, Nov 1999 updated May 2005
  11. Saravanan P, Chau F, Roberts N, Vedhara K, Greenwood R, Dayan CM, 2002, Psychological Well-Being in Patients on "Adequate" Doses of L-Thyroxine Results of a Large, Controlled Community-Based Questionnaire Study, *Clinical Endocrinology*, 2002, 57: 577-585
  12. The Royal College of Physicians "Patients need UK medicines strategy" Press Release.  
[http://www.politics.co.uk/opinion-formers/press-releases/health/patients-need-uk-medicines-strategy-says-rcp-\\$1266188\\$365674.htm](http://www.politics.co.uk/opinion-formers/press-releases/health/patients-need-uk-medicines-strategy-says-rcp-$1266188$365674.htm)
  13. Medicines and Healthcare Products Regulatory Agency. Review of unlicensed medicines.  
<http://www.mhra.gov.uk/Howweregulate/Medicines/Reviewofunlicensedmedicines/index.htm>

## Guidelines are Mandatory

Some believe guidelines are voluntary, mere recommendations without any real threat to physicians and their practices. Some will also point to vague guideline wordings to point out the allowance for noncompliant medical practice. So some would claim that physicians should be able to treat ethically.

However, when guidelines are accompanied by the potential for disciplinary action, they are considered mandatory. An application of the logic [1] in the US Supreme Court ruling in *Goldfarb v. Virginia State Bar* [2] prove that guidelines in the presence of enforcement are mandatory. This logical reasoning examines the gains and liabilities of a physician violating the guidelines by prescribing T<sub>3</sub> and the liability of a General Medical Council (GMC) investigation and potential adverse ruling. The medical care earns little while the legal fees surrounding the GMC investigation are high and the potential loss of career is extremely high. The safe course for the physician is to simply avoid the threat by the GMC by not attempting to treat a patient with mimics of hypothyroidism for her continuing chronic symptoms.

The impact of potential litigation upon guidelines is substantial. Since the judiciary produces resolutions by the preponderance of evidence, vague words such as *generally* becomes *always*. *Rarely* becomes *never*. The guidelines become absolute. This is an important fact, because absolute concepts are subject to falsification by counterexamples. Indeed, the counterexamples herein falsify the thyroxine-only therapy customary practice for the mimics of hypothyroidism.

Since medical practice guidelines are effectively mandatory and have been recognized by law as mandatory, the endocrinology establishment must be convinced that their guidelines are improper. Endocrinology must be convinced because, it seems, there is apparently no government agency willing to act upon their legislated mandates of protecting the health and welfare of the citizens. Counterexamples can potentially change this.

### Endnotes Guidelines are Mandatory

1. The enforcement of guidelines makes not complying with them a liability. That liability is substantially more than any gain and consequently changes the nature of guidelines change from voluntary to mandatory.
2. *Goldfarb v. Virginia State Bar*. 421 U.S. 773, (1975)
3. The Diagnosis and Management of Primary Hypothyroidism, Royal College of Physicians, 2008
4. UK Guidelines for the Use of Thyroid Function Tests, The Association for Clinical Biochemistry, British Thyroid Association, British Thyroid Foundation, 2006, [www.british-thyroid-association.org/guidelines.htm](http://www.british-thyroid-association.org/guidelines.htm)
5. Vanderpump MPJ, Ahlquist JAO, Franklyn JA, et al., Consensus Statement for Good Practice and Audit Measures in the Management of Hypothyroidism and Hyperthyroidism, *BMJ*, August 1996
6. Baskin HJ, MD, Medical Guidelines for Clinical Practice for the Evaluation and Treatment of Hyperthyroidism and Hypothyroidism, *Am Assoc Clin Endocrinol*, 2002, Rev 2006
7. Levy EG, Ridgway EC, Wartofsky L, Algorithms for Diagnosis and Management of Thyroid Disorders, [www.thyroidtoday.com](http://www.thyroidtoday.com) 2004.
8. The American Thyroid Association provides links to several hypothyroidism related guidelines: *Use of Laboratory Tests in Thyroid Disorders*, *Treatment Guidelines for Patients with Hyperthyroidism and Hypothyroidism*, and *Guidelines for Detection of Thyroid Dysfunction*.
9. Levy EG, Hypothyroidism Treatment Failure: Differential Diagnosis, [www.thyroidtoday.com](http://www.thyroidtoday.com) 2004.
10. Garber JR, Hennessey JV, Lieberman JA, Morris CM, Talbert RI, Managing the Challenges of Hypothyroidism, *Supplement to J of Fam Pract*, 2006, [www.jponline.com](http://www.jponline.com)

## The Importance of Counterexamples and Sir Karl Popper

The absolute natures of guideline statements (or guideline statements made absolute by potential disciplinary action) make counterexamples important. They are important because, theoretically, a single counterexample that matches the premise of an absolute statement falsifies that statement. There are many counterexamples to the application of the customary practice of applying hypothyroidism diagnostics and treatment to the mimics of hypothyroidism.

These guidelines claim that the only therapy that can work for the symptoms of hypothyroidism is levothyroxine sodium ( $T_4$ ) and that no triiodothyronine ( $T_3$ ) therapy shall be used as it is ineffective. The counterexamples demonstrate the failure of this absolute statement. There are three types of the counterexamples:

1. The failure of the  $T_4$ -only therapy and the subsequent success of a  $T_3$  therapy, or
2. The success of a  $T_3$  therapy and subsequent failure of the  $T_4$ -only therapy, or
3. The failure of guideline prescribed diagnostics to identify the cause of the symptoms of hypothyroidism and the subsequent success of a  $T_3$  therapy.

Logically, by *modus tollens*, [1] then the counterexamples demonstrate, at least, the guidelines are not completely true as stated, i.e., the guideline is falsified as written.

Falsified absolute statements do not constitute any science according to the famous philosopher Sir Karl Popper, [2] who was recognized with knighthood. [3] His influence extended to the US Supreme Court in its formulation of the *Daubert Rule*, [4] which is being considered by UK courts, [5] see Appendix C.

Thus, studies by endocrinology that allegedly demonstrate the uselessness of  $T_3$  therapies are trumped by the counterexamples because the lack of falsification is far more important than confirming studies. As will be concluded in Section 2, these studies are not applicable to the mimics of hypothyroidism and their application to these mimics is simply junk science.

### Endnotes - Importance

1. Geisler NL, Brooks RM, Come, Let Us Reason, Baker Book House, original printing 1990
2. Popper KR, *Conjectures and Refutations*, 1963, pgs 33-39 excerpted on the internet at [www.stephenjaygould.org/ctrl/popper\\_falsification.html](http://www.stephenjaygould.org/ctrl/popper_falsification.html) and reprinted Routledge Classics, 2003, pgs 43-51
3. Sir Karl Popper was knighted by Her Majesty.
4. *Daubert v. Merrell, Dow Pharmaceuticals*, (509 US 579)
5. *Forensic Science on Trial*, Seventh Report of Session 2004-05, House of Commons Science and Technology Committee, 16 March 2005

## Primary Argument Conclusions

1. Numerous statements of medical policy, medical ethics, human rights acts, consent requirements and case law are ignored in physician-patient consultations with regard to mimics of hypothyroidism.
2. The scope of thyroid gland function tests is too narrow to detect mimics of hypothyroidism. Additional tests are needed to serve patients properly and efficiently.
3. There is a 13+% failure rate of those treated for hypothyroidism with levothyroxine sodium only. This failure rate is understandable when considering Chemically Euthyroid Hypometabolism (CEH).
4. Potentially 6% of the population suffers from Chemically Euthyroid Hypometabolism but their suffering goes undetected.
5. A QALY (Quality Assessed Life-Years) analysis is zero or negative for the thyroxine-only treatment theory when applied to patients with mimics of hypothyroidism. This contraindicates the thyroxine-only therapy for the mimics.
6. Counterexamples, individual patients and study subjects, find that many people do not regain their former health with a thyroxine ( $T_4$ ) only therapy, but do well on a proscribed triiodothyronine ( $T_3$ ) containing therapy, which is banned by endocrinology associations.
7. The counterexamples invalidate the blanket proscription on all  $T_3$  containing therapies for treating the symptoms of hypothyroidism.
8. In theory, medical practice standards and ethics denounce systematic abuse of patients. But such abuse exists.

## Section 2

Section 2, first, outlines the history of the discoveries relating to hypothyroidism and its mimics. This provides the basis for understanding the linguistic confusion in this niche of endocrinology. Then confirming studies from endocrinology can be examined with precise terminology and counterexamples. Differential Diagnosis, as applied by the hypothyroidism guidelines, is improperly formulated. These matters are tabulated below as a preview.

### Endocrinology vs. Counterexamples - Table 3

Endocrinology	vs.	Counterexamples
The post thyroid functions of peripheral metabolism and peripheral cellular hormone reception should be ignored academically [1,2] and by medical practice. [3-14]	vs.	The dominant hormone in post thyroid functions is triiodothyronine (T <sub>3</sub> ). [15-41] It is required by some patients to properly mitigate the symptoms of hypothyroidism. [20,24,33-41] It is required anecdotally by the counterexamples described herein.
Triiodothyronine (T <sub>3</sub> ) is not required by patients for the mitigation of the symptoms of hypothyroidism. [3-14]	vs.	Triiodothyronine (T <sub>3</sub> ) is required by some patients to properly mitigate the symptoms of hypothyroidism. [20,24,33-41] It is required anecdotally by the counterexamples described herein.
Once the thyroid stimulating hormone (TSH) is normalized, no further thyroid hormone replacement is required. [3-6]	vs.	The failures of endocrinology were studied [35] and subsequently treated with desiccated thyroid.  The existence of euthyroid hypometabolism. [41]  Counterexample patient experiences, such as patients S and K others described herein.
The normal reference range is scientifically based.	vs.	The original range was empirically determined statistically by assuming the center 95% were "normal." Subsequently, a study found 2.2% were hyperthyroid and 9.5% were hypothyroid. [42]
TSH, fT <sub>4</sub> , and thyroid gland antibodies are the only diagnostics needed for the symptoms of hypothyroidism.[2-6,8,14]	vs.	The high failure rate (13%) in the treatment of hypothyroidism is a counterexample.[43,44]  The diagnostics for euthyroid hypometabolism [34,41] is a counterexample.  The need for proper adrenal activity is a counterexample. [45]  And the counterexample patient experiences herein, that exemplify the many other counterexamples.
The well being of patients is always foremost in endocrinology.	vs.	The post thyroid functions of peripheral metabolism and peripheral cellular hormone reception are ignored academically [1,2] and by medical practice, [3-14] but they exist. [15-41]



3. The The The Diagnosis The Diagnosis The Diagnosis and The Diagnosis and The Diagnosis and Management The Diagnosis and Management
4. UK UK UK Guidelines UK Guidelines UK Guidelines for UK Guidelines for UK Guidelines for the UK Guidelines for the British British British Thyroid British Thyroid British Thyroid Association, British Thyroid Association, British Thyroid Association, [association.org/guidelines.htm](http://www.british-thyroid-association.org/guidelines.htm)
5. Vanderpump Vanderpump Vanderpump MPJ, Vanderpump MPJ, Vanderpump MPJ, Ahlquist Vanderpump MPJ, Ahlquist Audit Audit Audit Measures Audit Measures Audit Measures in Audit Measures in Audit Measures in the Audit Measures in the
6. Baskin Baskin Baskin HJ, Baskin HJ, Baskin HJ, MD, Baskin HJ, MD, Baskin HJ, MD, Medical Baskin HJ, MD, Medical Hyperthyroidism Hyperthyroidism Hyperthyroidism and Hyperthyroidism and Hyperthyroidism and Hypothyroidism, Hypothyroidism, Hypothyroidism
7. Weetman AP, Whose Thyroid Hormone Replacement is it Anyway? *Clin Endocrinol*, 2006;64(3):231-233
8. *Wilson's Syndrome*, American Thyroid Association, Nov 1999 updated May 2005
9. Sawka, AM, Gerstein, HC, Marriott, MJ, MacQueen GM, and Joffe, RT, Does a Combination Regimen of Thyroxine (T<sub>4</sub>) and 3,5,3'-Triiodothyronine Improve Depressive Symptoms Better Than T<sub>4</sub> Alone in Patients With Hypothyroidism? Results of a Double-Blind, Randomized, Controlled Trial, *J Clin Endocrinol Metabol*, 2004, 89(3); 1486-7
10. Siegmund W, Spieker K, Weike AI, Giessmann T, Modess C, Dabers T, Kirsh G, Sanger E, Engle G, Hamm AO, Nauck M, Meng W., Replacement Therapy with Levothyroxine Plus Triiodothyronine (Bioavailable Molar Ratio 14:1) is not Superior to Thyroxine Alone to Improve Well-Being and Cognitive Performance in Hypothyroidism, *Clin Endocrinol*, 2004 June;60(6):750-757
11. Walsh, Dr. John P., Combined Thyroxine/Liothyronine Treatment Does Not Improve Well-Being, Quality of Life, or Cognitive Function Compared to Thyroxine Alone: A Randomized Controlled Trial in Patients with Primary Hypothyroidism, *J Clin Endocrinol Metabol*, 88(10):4543-50.
12. Clyde, Patrick W, MD, Combination Levothyroxine/Liothyronine Shows No Obvious Benefit Over Levothyroxine Alone in Patients With Primary Hypothyroidism, *JAMA*, December 2003 as reported by Joene Hendry of *Doctor's Guide*.
13. Grozinsky-Glasberg S, Fraser A, Nahshoni E, Weizman A, Leibovici L., Thyroxine-Triiodothyronine Combination Therapy Versus Thyroxine Monotherapy for Clinical Hypothyroidism: Meta-Analysis of Randomized Controlled Trials, *J Clin Endocrinol Metab*, 2006, 91(7): 2592-2599
14. Garber JR, *Hypothyroidism Talking Points 2006*, AACE
15. Visser TJ, Leonard JL, Kaplan MM, Larsen PR, Kinetic Evidence Suggesting Two Mechanisms for Iodothyronine 5'-deiodination in Rat Cerebral Cortex, *Proc. Natl Acad Sci. USA*, August 1982, 79:5080-84
16. Kaplan MM, Utiger, RD, Iodothyronine Metabolism in Rat Liver Homogenates, *J Clin Invest*, February 1978, 61:459-471
17. Hidal JT, Kaplan MM, Characteristics of Thyroxine 5'-Deiodination in Cultured Human Placental Cells Regulation by Iodothyronines, September 1985, *J Clin Invest*, 76:947-955
18. Kaplan MM, Yaskoski KA, *Maturational Patterns of Iodothyronine Phenolic and Tyrosyl Ring Deiodinase Activities in Rat Cerebrum, Cerebellum, and Hypothalamus*, *J Clin Invest*, April 1981, 67:1208-1214
19. Braverman LE, Ingbar SH, Keinew S, Conversion of Thyroxine (T<sub>4</sub>) to Triiodothyronine (T<sub>3</sub>) in Athyrotic Human Subjects, *The J Clin Invest*, 1970, 49
20. Danzi S, Ojamaa K, and Klein I, Triiodothyronine-Mediated Myosin Heavy Chain Gene Transcription in the Heart, *Am J Phys Heart Circ Physiol*, Feb 27, 2003
21. Eisenstein Z, Hagg S, Braverman LE, et al., Effect of Starvation on the Production and Peripheral Metabolism of 3,3',5' Triiodothyronine in Euthyroid Obese Subjects, *J Clin Endocrinol Metab*, 1978, 47(4): 889-893
22. Nomura S., et al. Reduced Peripheral Conversion of Thyroxine to Triiodothyronine in Patients with Hepatic Cirrhosis, *J of Clin Invest*, Sept 1975, 56(3): 643-652.
23. Bianchi R, Mariani G, Molea N, Vitek F, Cazzuola F, Carpi A, Mazzuca N, Toni MG, Peripheral Metabolism of Thyroid Hormones in Man. Direct Measurement of the Conversion Rate of Thyroxine to 3,5,3'-Triiodothyronine (T<sub>3</sub>) and Determination of the Peripheral and Thyroidal Production of T<sub>3</sub>, *J. Clin Endocrinol Metab.*, 1983 June; 56(6):1152-63
24. Kelly G, Peripheral Metabolism of Thyroid Hormones: A Review, *Alt Med Rev*, 2000, 5(4): 306-333. (Includes large bibliography on peripheral metabolism.)
25. Danforth E, Burger AG, Ingbar SH, Braverman L, et al., Dietary-Induced Alterations in Thyroid Hormone Metabolism during Overnutrition, *J Clin Invest*, November 1979, 64: 1336-47
26. Surks MI, Schadow AR, Stock JM, Oppenheimer JH, Determination of Iodothyronine Absorption and Conversion of L-Thyroxine (T<sub>4</sub>) to L-Triiodothyronine (T<sub>3</sub>) Using Turnover Rate Techniques, *J Clin Invest*, April 1973, 52:805-811

27. Sakurai A, Takeda K, Ain K, et al., Generalized Resistance to Thyroid Hormone Associated with a Mutation in the Ligand-Binding Domain of the Human Thyroid Hormone Receptor, *Proc. Natl. Acad. Sci*, November 1989, 86:8977-81.
28. Refetoff S, Weiss RE, Usala SJ, The Syndromes of Resistance to Thyroid Hormone, *Endocr Rev*, 1993, 14(3):348-399
29. Weiss RE, Refetoff S, Treatment of Resistance to Thyroid Hormone Primum Non Nocere, *J Clin Endocr Metabol*, 84(2):401-404.
30. Pohlenz J, Weiss RE, Macchia PE, et al., Five New Families with Resistance to Thyroid Hormone not Caused by Mutations in the Thyroid Hormone Receptor  $\beta$  Gene, *Journal of Clinical Endocrinology & Metabolism*, 84(11):3919-28
31. Yen PM, Sugawara A, Refetoff S, Chin WW, New Insights on the Mechanism(s) of the Dominant Negative Effect of Mutant Thyroid Hormone Receptor in Generalized Resistance to Thyroid Hormone, *Am Soc Clin Invest*, November 1992, 90:1825-31
32. Jameson JL, Editor, *Hormone Resistance Syndromes*, Humana Press, 1999
33. Starr, Mark MD, *Hypothyroidism Type 2*, Mark Starr Trust, Columbia, MO, 2005
34. Lowe JC, *The Metabolic Treatment of Fibromyalgia*, McDowell Publishing Company, 2000
35. Baisier, W V, Hertoghe, J., Beeckhaut, W., Thyroid Insufficiency? Is Thyroxine the Only Valuable Drug?, *J Nutr and Environ Med*, September 2001, 11(3):159-166
36. Gaby AR, Sub-Laboratory Hypothyroidism and the Empirical use of Armour® Thyroid, *Alt Med Rev*, 2004, 9(2)
37. Danzi S and Klein I, Potential Uses of  $T_3$  in the Treatment of Human Disease, *Clin Cornerstone*, 2005, 7(S2): S9-S15
38. Bunevacius, R MD PhD, Kacanavicius, G MD PhD, Zalinkinevicius, R MD, Prange, A MD, Effects of Thyroxine as Compared with Thyroxine plus Triiodothyronine in Patients with Hypothyroidism, *NEJM*, Feb 11, 1999, 340:424-429
39. Bente C, Appelhof EF, Ellie MW, et al., Combined Therapy with Levothyroxine and Liothyronine in Two Ratios, Compared with Levothyroxine Monotherapy in Primary Hypothyroidism: a Double-Blind, Randomized, Controlled Clinical Trial, *J Clin Endocrinol Metabol*, 90(5):2666-2674.
40. Hertoghe T, Lo Cascio A., Hertoghe J. Considerable improvement of hypothyroid symptoms with two combined  $T_3$ - $T_4$  medication in patients still symptomatic with thyroxine treatment alone. *Anti-Aging Medicine*, Ed. German Society of Anti-Aging Medicine-Verlag 2003- 2004; 32-43
41. Goldberg M, The Case For Euthyroid Hypometabolism, *Am J Med Sc* October, 1960 pgs 479-493
42. Canaris GJ, Manowitz NR, Mayor G, Ridgway EC, The Colorado Thyroid Disease Prevalence Study, *Archives of Internal Medicine*, 2000, 160(4)
43. Saravanan P, Chau F, Roberts N, Vedhara K, Greenwood R, Dayan CM, 2002, Psychological Well-Being in Patients on "Adequate" Doses of L-Thyroxine Results of a Large, Controlled Community-Based Questionnaire Study, *Clinical Endocrinology*, 2002, 57: 577-585
44. Kaplan MM, Sarne DH, Schneider AB, In Search of the Impossible Dream? Thyroid Hormone Replacement Therapy That Treats All Symptoms in All Hypothyroid Patients
45. Federal Drug Administration NDA 10-379 for Cytomel®
46. The enforcement of guidelines makes not complying with them a liability. That liability changes the nature of guidelines change from voluntary to mandatory.
47. *Goldfarb v. Virginia State Bar*. 421 U.S. 773, (1975)
48. *Forensic Science on Trial*, Seventh Report of Session 2004 05, House of Commons Science and Technology Committee, 16 March 2005
49. Popper KR, *Conjectures and Refutations*, 1963, pgs 33-39 excerpted on the internet at [www.stephenjaygould.org/ctrl/popper\\_falsification.html](http://www.stephenjaygould.org/ctrl/popper_falsification.html) and reprinted Routledge Classics, 2003, pgs 43-51
50. *Bolitho v City and Hackney Health Authority* [1997] 4 All ER 771.
51. Benson K, Hartz AJ, A Comparison of Observation Studies and Randomized Controlled Trials, *NEJM*, June 22, 2000, pgs 1878-86.
52. Pritchard EK, The Linguistic Etiologies of Thyroxine-Resistant Hypothyroidism, *Thyroid Science* [www.thyroidscience.com](http://www.thyroidscience.com) click on *debate*.
53. Scalia A, Garner BA, *Making Your Case - The Art of Persuading Judges*, Thompson/West, 2008, pg 44

## The History of Thyroid Related Medical Science

The historical background of hypothyroidism sheds light on the source of the suffering for 13+% of those being treated for hypothyroidism [1,2] plus still more with symptoms who are, nevertheless, declared healthy. [3] Thus, out of the approximate 2.5 million being treated in the UK, 300,000, mostly women, are not being treated adequately or properly. Additionally, there is a greater problem of false negative diagnostic results that potentially add another 6% of the population, another 3.6 million [3] Thus, the number of unnecessarily mistreated, medically abused patients in the UK number in the millions. They are victims of continuing symptoms of hypothyroidism caused by post thyroid deficiencies of mimics of hypothyroidism.

Hypothyroidism has been recognized as an illness since Gull discovered this condition in 1874. The history of medical science relating to hypothyroidism, both inside and outside of the leading thinking of endocrinology is listed in Table 4 below (*Milestones in Thyroid Hormone Behavior Studies*). This table chronicles milestones in the medical research and treatment of hypothyroidism. [3-8] As demonstrated below, prior to the introduction of levothyroxine-only therapy, patients were treated with natural desiccated thyroid extract, and generally, did not continue to have symptoms of hypothyroidism. Consequently, a false belief became entrenched: that the thyroid gland is the sole cause of symptoms and that no other mechanism exists.

The use of synthetic thyroxine ( $T_4$ ), which began sometime prior to 1947, put that false belief into question. Levothyroxine sodium was not doing all that was claimed. Patients continued to present symptoms of hypothyroidism (see Table 1 above, *Symptom Prevalence among Failed Patients*). Therefore, in contrast to the predominating belief that levothyroxine-only treatment is sufficient for all sufferers of the symptoms of hypothyroidism, these patients demonstrate that there must be further consideration for conversion and reception mechanisms.

Prior to the introduction of the synthetic thyroid hormone, levothyroxine sodium, which is a virtually pure thyroxine replacement, treatment was with natural desiccated thyroid extract which contains the hormones, monoiodothyronine ( $T_1$ ), diiodothyronine ( $T_2$ ) and triiodothyronine ( $T_3$ ) and thyroxine ( $T_4$ ). Since thyroid extract delivers all of the thyroid-related hormones essential to all cells of the human body, these hormones have positive significance as demonstrated by Patient S and many other counterexamples.

Indeed Table 4 shows that Gross and Pitt-Rivers, circa 1952, found  $T_3$  to be more active than  $T_4$ . Further discoveries in 1967 and 1970 found a link between the thyroid gland and the chemical changes that occur in the tissues as a result of thyroid hormone reception. The crucial role of peripheral cellular hormone reception was described by Refetoff et al., circa 1967. This is a mechanism whereby the cells of the body acquire particular hormones from the circulating blood. The conversion of the pro-hormone  $T_4$  to the active hormone  $T_3$  was discovered circa 1970, by Braverman et al. Thus, circulating serum thyroid hormones (as described by laboratory tests) are subject to changes before they can be effectively assimilated and able to perform their prescribed function. These crucial discoveries undo the oversimplified understanding of hypothyroidism posited and dictated by dominant endocrinology teachings today, and explain why levothyroxine-only treatment may result in continuing hypothyroid symptoms and the need for  $T_3$ -containing hormone replacements as well as potential adrenal replacements. The

following quotation clarifies post thyroid, peripheral endocrine-system physiology:

*T<sub>4</sub> . . . is not the active ingredient. T<sub>3</sub> is the active ingredient, and it's the thing that accounts for the thyroid hormone action. As I've been reminded many times, there are no intracellular events that we know that can be described by T<sub>4</sub> at the level of the nucleus. Only T<sub>3</sub>. T<sub>4</sub> is not the active compound. Likewise, the site of action is in the nucleus. The site of action is not T<sub>4</sub> in the plasma.*  
Dr. E. Chester Ridgway [9]

A sampling of studies provides greater proof of the existence of peripheral conversion [10-21] and peripheral hormone reception resistance. [22-29] Other sources can be found in these references as well as the extensive book *The Metabolic Treatment of Fibromyalgia* [7] by Dr. John Lowe.

Medicine can successfully treat those patients who are failed with levothyroxine-only therapy. The empirical study by Baisier, et al., *Thyroid Insufficiency? Is Thyroxine the Only Valuable Drug?* [30] demonstrates that a T<sub>3</sub>-containing hormone replacement (desiccated thyroid) is needed for clinical euthyroidism when levothyroxine (T<sub>4</sub>) alone therapy fails to significantly reduce symptom intensity. Further positive evidence for using T<sub>3</sub>-containing hormone replacements can be found in the references. [31-35] Therefore, both the medical evidence and treatment expertise confirm that for some patients a T<sub>3</sub> containing hormone replacement therapy is necessary to restore health, because, without a doubt, there are post-thyroid operations upon thyroid hormones, and without a doubt, bodily functions do become deficient or fail.

With research demonstrating the importance of peripheral reception and the active role of T<sub>3</sub>, the understanding of hypothyroidism was differentiated between clinical and chemical euthyroidism. Clinical euthyroidism is the absence of the symptoms of thyroid-related abnormalities and consequently implies that there is no noticeable net abnormality from the hypothalamus to the nuclei, or the chemical changes that occur in the tissues as a result of thyroid hormone reception. Chemical euthyroidism is demonstrated by the assay of thyroid gland behavior that shows normality or effective normality of that gland. This difference is the source of substantial confusion noted in the following lament by Anthony Toft and Geoffrey Beckett. [36]

*It is extraordinary that more than 100 years since the first description of the treatment of hypothyroidism and the current availability of refined diagnostic tests, debate is continuing about its diagnosis and management.*

The confusion is demonstrated by the following pair of seemingly unexplainable anecdotes: The assay of the first patient of her thyroid-stimulating hormone (TSH) indicates severe hyperthyroidism, but the patient is clinically euthyroid. The assay of the second patient of her TSH indicates severe hypothyroidism, but she is clinically euthyroid. How can such puzzling patient examples be explained by predominant thinking in endocrinology? They cannot. Instead, these cases can only be explained as a result of peripheral reception deficiencies and excessive efficiencies, respectively. However, and unfortunately, since peripheral endocrine-system etiologies are not accounted for by the existing model, [37,38] and existing medical

practice guidelines, they generally remain medical mysteries. If these peripheral endocrine system etiologies were investigated, peripheral thyroid receptor deficiencies would be treated, instead of being ignored.

The endocrinology establishment has sought to excuse its errors and confusion by making excuses for its failures. If a patient has thyroid test results within allegedly "normal" reference ranges but continues to have the symptoms of hypothyroidism, she is diagnosed as having *functional somatoform disorders*, [39] which blames her for imagining her suffering. Alternatively, she might be diagnosed as *just getting old*. Or, the physician might blame medicine for being unable to deal with her *nonspecific symptoms*. [40]

**Table 4 - Milestones in Thyroid Hormone Behavior Studies [3-8]**

<b>Circa</b>	<b>Event</b>
1786	Association between hyperthyroid state and changes in heart and eyes noted
1820	Iodide therapy used in Europe to treat goiters [Marine & Kimball]
1871	Cretinism described
1874	Myxedema (Gull's disease) described [Gull]
1883	Myxedema discovered after thyroidectomy [Kocher]
1891	Thyroid extract therapy for myxedema [Murray]
1895	Effect of thyroid on controlling metabolic rate discovered
1912	Hashimoto's disease described
1914	Thyroid hormone discovered and crystallized [Kendall]
1926	Structure determination of thyroxine (T <sub>4</sub> ) [Harrington]
1947	Some patients using synthetic thyroxine continue to exhibit symptoms. [Kirk & Kvorning] Confirmed by Means in 1954.
1952	Identification of triiodothyronine (T <sub>3</sub> ), the much more active thyroid-related hormone [Gross & Pitt-Rivers]
	<i>The thyroid-only hypothyroidism paradigm became entrenched.</i>
1958	The synthetic thyroxine, Synthroid®, marketed without patent protection.
1960	Euthyroid hypometabolism discovered and studied [Goldberg]
1961	Diagnosis of Euthyroid Hypometabolism [Goldberg]
1963	Thyrotropin (TSH) purified
1960's	Thyrotropin (thyroid stimulating hormone) assay developed [Utiger & Odell]
1967	Resistance to thyroid hormone receptor found [Refetoff, Dewind, DeGroot]
1970	Evidence that circulating T <sub>3</sub> was derived largely from peripheral monodeiodination (conversion) of T <sub>4</sub> [Braverman, Ingbar, & Sterling]



22. Goldberg M, Diagnosis of Euthyroid Hypometabolism, *Am J Obst & Gynec*, 81(5): 1053-1058, 1961
23. Refetoff S, Dewind LT, DeGroot LJ, Familial Syndrome Combining Deaf-mutism, Stippled Epiphyses, Goiter and Abnormally High PB I: Possible Target Organ Refactoriness to Thyroid Hormone, *J Clin Endocrinol Metab*, 27:279, 1967
24. Sakurai A, Takeda K, Ain K, et al., Generalized Resistance to Thyroid Hormone Associated with a Mutation in the Ligand-Binding Domain of the Human Thyroid Hormone Receptor, *Proc. Natl. Acad. Sci*, November 1989, 86:8977-81.
25. Refetoff S, Weiss RE, Usala SJ, The Syndromes of Resistance to Thyroid Hormone, *Endocr Rev*, 1993, 14(3):348-399
26. Weiss RE, Refetoff S, Treatment of Resistance to Thyroid Hormone Primum Non Nocere, *J Clin Endocr Metabol*, 84(2):401-404.
27. Pohlenz J, Weiss RE, Macchia PE, et al., Five New Families with Resistance to Thyroid Hormone not Caused by Mutations in the Thyroid Hormone Receptor  $\beta$  Gene, *Journal of Clinical Endocrinology & Metabolism*, 84(11):3919-28
28. Yen PM, Sugawara A, Refetoff S, Chin WW, New Insights on the Mechanism(s) of the Dominant Negative Effect of Mutant Thyroid Hormone Receptor in Generalized Resistance to Thyroid Hormone, *Am Soc Clin Invest*, November 1992, 90:1825-31
29. Jameson JL, Editor, *Hormone Resistance Syndromes*, Humana Press, 1999
30. Baisier, W V, Hertoghe, J., Beekhaut, W., Thyroid Insufficiency? Is Thyroxine the Only Valuable Drug?, *J Nutr and Environ Med*, September 2001, 11(3):159-166
31. Gaby AR, Sub-Laboratory Hypothyroidism and the Empirical use of Armour® Thyroid, *Alt Med Rev*, 2004, 9(2)
32. Danzi S and Klein I, Potential Uses of  $T_3$  in the Treatment of Human Disease, *Clin Cornerstone*, 2005, 7(S2): S9-S15
33. Bunevacius, R MD PhD, Kacanavicius, G MD PhD, Zalinkinevicius, R MD, Prange, A MD, Effects of Thyroxine as Compared with Thyroxine plus Triiodothyronine in Patients with Hypothyroidism, *NEJM*, Feb 11, 1999, 340:424-429
34. Bente C, Appelhof EF, Ellie MW, et al., Combined Therapy with Levothyroxine and Liothyronine in Two Ratios, Compared with Levothyroxine Monotherapy in Primary Hypothyroidism: a Double-Blind, Randomized, Controlled Clinical Trial, *J Clin Endocrinol Metabol*, 90(5):2666-2674.
35. Hertoghe T, Lo Cascio A., Hertoghe J. Considerable improvement of hypothyroid symptoms with two combined  $T_3$ - $T_4$  medication in patients still symptomatic with thyroxine treatment alone. *Anti-Aging Medicine*, Ed. German Society of Anti-Aging Medicine-Verlag 2003- 2004; 32-43
36. Toft A, Beckett G, *BMJ* 2003 (8 Feb); 326:295-296
37. Joint Committee on Higher Medical Training, *Higher Medical Training Curriculum for Endocrinology and Diabetes Mellitus*, 2003, 5 Saint Andrews Place, Regents Park, London NW1 4LB
38. Also compare the thyroid related history of [4] against its diagnostic and therapy recommendations.
39. Weetman AP, Whose Thyroid Hormone Replacement is it Anyway? *Clin Endocrinol*, 2006;64(3):231-233
40. *Wilson's Syndrome*, American Thyroid Association, Nov 1999 updated May 2005

## Confusing Linguistics

The terminology describing the thyroid related issues are confusing because the word *thyroid* is routinely used to describe the thyroid gland, or alternatively, the greater thyroid system. Thus, all of the terms with *thyroid* as their root, such as *hypothyroidism*, are potentially confusing. The consequences of this confusion inspired the following quite appropriate lament by Drs. Anthony Toft and Geoffrey Beckett: [1]

*It is extraordinary that more than 100 years since the first description of the treatment of hypothyroidism and the current availability of refined diagnostic tests, debate is continuing about its diagnosis and management.*

The critical term, *hypothyroidism*, is defined in two ways in the UK and elsewhere. The guidance from the RCP effectively defines hypothyroidism as *the clinical consequences of insufficient secretion by the thyroid gland*. [2] However, the BTA guideline effectively defines hypothyroidism as *the clinical consequences of insufficient levels of thyroid hormones in the body*. [3] Unfortunately, these supposedly equivalent definitions are physiologically different. Obviously, the first definition is only associated with the thyroid gland. However, as evident in the description of the greater thyroid system in Table 2 and the history of thyroid related discoveries in Table 4, the second definition is also associated with the post thyroid functions of peripheral metabolism and peripheral cellular hormone reception. Deficiencies in these functions also produce insufficient thyroid hormones in the body. These deficiencies are mimics of hypothyroidism, not hypothyroidism according to the proper definition.

This confusion is contrary to guideline authorship standards of care. [4,5] Although the RCP guideline, [2] uses the first, narrow definition and supposedly has medical jurisdiction only on the thyroid gland, its diagnostic and therapy restrictions adversely affect the mimics of hypothyroidism (such as Chemically Euthyroid Hypometabolism). [6] Although the BTA guideline [3] uses the second, broad definition, the recommended diagnostics and therapies only address the thyroid gland and do not address the mimics of hypothyroidism. Thus, in both situations, the mimics of hypothyroidism do not receive proper recognition or care.

This confusion may be the reason for the over-interpretation of studies [7-11] designed to test thyroid gland function for  $T_3$  to suggest that  $T_3$  had no value for treating the symptoms of hypothyroidism by any cause. Certainly, no guideline and no study stipulate the definition of its critical terms as required by a standard of care in endocrinology [5] and established standards of linguistic care.

Proper definitions and logical consistency would allow physicians to treat ethically without undue worries for his/her career. This win-win situation would exist if either the RCP (narrow, thyroid-centric) or BTA (broad, symptom-centric) definitions were used so long as logical consistency were maintained. [12]

### Endnotes Confusion

1. Toft A, Beckett G, *BMJ* 2003 (8 Feb); 326:295-296
2. The Diagnosis and Management of Primary Hypothyroidism, Royal College of Physicians, 2008

3. UK Guidelines for the Use of Thyroid Function Tests, The Association for Clinical Biochemistry, British Thyroid Association, British Thyroid Foundation, 2006, [www.british-thyroid-association.org/guidelines.htm](http://www.british-thyroid-association.org/guidelines.htm)
4. *Concise Guidance to Good Practice*, Royal College of Physicians, 2003, pg 3, [www.rcplondon.ac.uk](http://www.rcplondon.ac.uk)
5. Mechanic JJ, Berman DA, Braithwaite SS, Palumbo PJ, American Association of Clinical Endocrinologists Protocol for Standardized Production of Clinical Practice Guidelines, *Endocr Pract*, 2004, 10(4)
6. Goldberg M, The Case For Euthyroid Hypometabolism, *Am J Med Sc* October, 1960 pgs 479-493
7. Sawka, AM, Gerstein, HC, Marriott, MJ, MacQueen GM, and Joffe, RT, Does a Combination Regimen of Thyroxine (T<sub>4</sub>) and 3,5,3'-Triiodothyronine Improve Depressive Symptoms Better Than T<sub>4</sub> Alone in Patients With Hypothyroidism? Results of a Double-Blind, Randomized, Controlled Trial, *J Clin Endocrinol Metabol*, 2004, 89(3); 1486-7
8. Siegmund W, Spieker K, Weike AI, Giessmann T, Modess C, Dabers T, Kirsh G, Sanger E, Engle G, Hamm AO, Nauck M, Meng W., Replacement Therapy with Levothyroxine Plus Triiodothyronine (Bioavailable Molar Ratio 14:1) is not Superior to Thyroxine Alone to Improve Well-Being and Cognitive Performance in Hypothyroidism, *Clin Endocrinol*, 2004 June;60(6):750-757
9. Walsh, Dr. John P., Combined Thyroxine/Liothyronine Treatment Does Not Improve Well-Being, Quality of Life, Or Cognitive Function Compared to Thyroxine Alone: A Randomized Controlled Trial in Patients with Primary Hypothyroidism, *J Clin Endocrinol Metabol*, 88(10):4543-50.
10. Clyde, Patrick W, MD, Combination Levothyroxine/Liothyronine Shows No Obvious Benefit Over Levothyroxine Alone in Patients With Primary Hypothyroidism, *JAMA*, December 2003 as reported by Joene Hendry of *Doctor's Guide*.
11. Grozinsky-Glasberg S, Fraser A, Nahshoni E, Weizman A, Leibovici L., Thyroxine-Triiodothyronine Combination Therapy Versus Thyroxine Monotherapy for Clinical Hypothyroidism: Meta-Analysis of Randomized Controlled Trials, *J Clin Endocrin Metab*, 2006, 91(7): 2592-2599
12. Pritchard EK, The Linguistic Etiologies of Thyroxine-Resistant Hypothyroidism, *Thyroid Science* [www.thyroidscience.com](http://www.thyroidscience.com) click on *debate*.

## Plain Text Interpretation

The factual arguments are dominated by the existence of counterexamples, individuals and subjects of studies. There are so many counterexamples, in fact, that fluke results are not likely. Beyond the facts, there are other arguments surrounding the texts, which also prove that the medical practice guidelines should be limited to the thyroid gland. They are the meaning of the texts, the intent of the authors, the precedents and traditions that might have affected their writings, and their relevant policies.

One approach to ascertaining the meaning of the text is to evaluate whole of the text, not just parts of it, using the plain meanings of the words. [1] Evaluating the text as a whole discounts the few logical inconsistencies in the text. The texts of the hypothyroidism guidelines, [2-10] from both the UK and the US, recommend diagnostics that are limited to the thyroid gland and potentially functionally preceding glands (the pituitary and the hypothalamus). The guidelines, which do make therapy recommendations, recommend only levothyroxine sodium ( $T_4$ ) to replace the major secretion of the thyroid gland, thyroxine ( $T_4$ ). The most influential guidelines go so far as to proscribe the prescription of competing triiodothyronine ( $T_3$ ) based hormone replacements, synthetic and natural. [2,5] Plainly, then, these guidelines address the diagnosis and treatment of the thyroid gland and potentially preceding glands only. They do not address mimics of hypothyroidism, such as Chemically Euthyroid Hypometabolism. Nonetheless, improperly, and imprudently, endocrinology, in its customary practice, proscribes the needed diagnostics and therapies for the mimics.

### Endnotes - Plain Text Interpretation

1. Scalia A, Garner BA, *Making Your Case - The Art of Persuading Judges*, Thompson/West, 2008, pg 44
2. The Diagnosis and Management of Primary Hypothyroidism, Royal College of Physicians, 2008
3. UK Guidelines for the Use of Thyroid Function Tests, The Association for Clinical Biochemistry, British Thyroid Association, British Thyroid Foundation, 2006, [www.british-thyroid-association.org/guidelines.htm](http://www.british-thyroid-association.org/guidelines.htm)
4. Vanderpump MPJ, Ahlquist JAO, Franklyn JA, et al., Consensus Statement for Good Practice and Audit Measures in the Management of Hypothyroidism and Hyperthyroidism, *BMJ*, August 1996
5. Baskin HJ, MD, Medical Guidelines for Clinical Practice for the Evaluation and Treatment of Hyperthyroidism and Hypothyroidism, *Am Assoc Clin Endocrinol*, 2002, Rev 2006
6. Levy EG, Ridgway EC, Wartofsky L, Algorithms for Diagnosis and Management of Thyroid Disorders, [www.thyroidtoday.com](http://www.thyroidtoday.com) 2004.
7. The American Thyroid Association provides links to several hypothyroidism related guidelines: *Use of Laboratory Tests in Thyroid Disorders*, *Treatment Guidelines for Patients with Hyperthyroidism and Hypothyroidism*, and *Guidelines for Detection of Thyroid Dysfunction*.
8. Levy EG, Hypothyroidism Treatment Failure: Differential Diagnosis, [www.thyroidtoday.com](http://www.thyroidtoday.com) 2004.
9. Garber JR, Hennessey JV, Lieberman JA, Morris CM, Talbert RI, Managing the Challenges of Hypothyroidism, *Supplement to J of Fam Pract*, 2006, [www.jponline.com](http://www.jponline.com)
10. Kaplan MM, Clinical Perspectives in the Diagnosis of Thyroid Disease, *Clin Chem*, 1999, 45:8(B) 1377-1383

## Counterexamples to and Critique of Confirming Studies

As found in the previous chapter and previewed in Table 3, the T<sub>4</sub>-only treatment confirming studies are invalid when their results are extended beyond the thyroid gland and applied to the post thyroid realm of the mimics of hypothyroidism, such as Chemically Euthyroid Hypometabolism. These confirming studies challenge good study practices, challenge established medical science of Gross and Pitt-Rivers, and deny counterexamples.

The purpose of these confirming studies, [1-5] for example, is to demonstrate that triiodothyronine (T<sub>3</sub>) replacing some thyroxine (T<sub>4</sub>) has no benefit over T<sub>4</sub> only, i.e., a T<sub>3</sub>/ T<sub>4</sub> combination is no better than a T<sub>4</sub>-only therapy. These studies have several faults when applied to the mimics of hypothyroidism:

1. Many studies were done with subjects that had primary hypothyroidism or thyroidectomies. These subjects nominally fit the narrow, thyroid-centric definition of hypothyroidism, *the clinical consequences of deficient secretion by the thyroid gland*. The subjects showed little if any benefit with the addition of T<sub>3</sub> to their therapy in lieu of some of the T<sub>4</sub>. Consequently, these results proved nothing for patients suffering from mimics of hypothyroidism. [6-16] The results do not extend to the broad, improper definition of hypothyroidism, *the clinical consequences of deficient thyroid hormones in the body*, for two reasons. First, the choice of subjects for the study does not support that generalization. Second, there are counterexamples to this extension of results.
2. The statistical analysis of these studies is flawed. The low occurrence rate of subjects having mimics of hypothyroidism permitted the authors to round off the low rate of improvement to nil and to conclude *no improvement*. However, there were some cases of improvement probably as a result of treating concurrent mimics of hypothyroidism, such as CEH
3. The T<sub>3</sub> doses were quite low, usually about 5 micrograms per day and always lower than the adult starting dose. This dose in patients who do suffer from mimics of hypothyroidism does not produce sustained noticeable benefits. Indeed, that dose is less than 10% of the usual replacement dose of 50 mcg to 100 mcg daily. In fact, 5 micrograms is the recommended *starting* dose for more sensitive patients, infants and the elderly. [17]

Quite unnoticed by medical practice is the contradiction by these studies [1-5] to the medical science of Drs. Gross and Pitt-Rivers, who in 1952, found T<sub>3</sub> more active than T<sub>4</sub>. However, these confirming studies [1-5] found T<sub>3</sub>, the more active hormone, is allegedly not effective while T<sub>4</sub>, the less active, pro-hormone, is effective.

The T<sub>4</sub>-only therapy concept is undermined, not the least by flawed research, but also by the widespread existence of counterexample studies, [6-16] for example, and counterexamples. Patient L, from the preceding section, and others in Appendix A below, demonstrate that when treated with T<sub>4</sub>-only to normalize her TSH, their symptoms of hypothyroidism remained. Only the addition of T<sub>3</sub> restored their well being. These patients demonstrate the critical role of T<sub>3</sub> therapy in contrast to the assertions of the levothyroxine-only studies.

Drs. Baisier, Herthoge, and Eeckhaut [13] studied the failures of endocrinology, treated patients with continuing symptoms with these endocrinology paradigm contradicting results:

1. The list of symptoms of the failures is the same list of symptoms of untreated patients. Hence, the failures are suffering from mimics of hypothyroidism such as CEH. [15]
2. A combination of eight symptom rough evaluations, known to medical practice as *nonspecific symptoms*, is a good clinical diagnostic.
3. An assay of a 24-hour urine sample is a better indicator of the need for therapy than TSH level.
4. A follow-up therapy using natural desiccated thyroid, was successful in spite of being proscribed by endocrinology. [13]

The Royal College of Physicians claims that anyone with a "normal" TSH level should not need any thyroid hormone of any type. [19] Yet those suffering from euthyroid hypometabolism do require T<sub>3</sub>. [15] T<sub>4</sub> would make them thyrotoxic.

Hopefully, the *Bolitho* [20,21] demand for logical medical practices will discredit the application of studies [1,5] and similar studies to the post thyroid mimics of hypothyroidism.

## Endnotes Critique

1. Sawka, AM, Gerstein, HC, Marriott, MJ, MacQueen GM, and Joffe, RT, Does a Combination Regimen of Thyroxine (T<sub>4</sub>) and 3,5,3'-Triiodothyronine Improve Depressive Symptoms Better Than T<sub>4</sub> Alone in Patients With Hypothyroidism? Results of a Double-Blind, Randomized, Controlled Trial, *J Clin Endocrinol Metabol*, 2004, 89(3); 1486-7
2. Siegmund W, Spieker K, Weiike AI, Giessmann T, Modess C, Dabers T, Kirsh G, Sanger E, Engle G, Hamm AO, Nauck M, Meng W., Replacement Therapy with Levothyroxine Plus Triiodothyronine (Bioavailable Molar Ratio 14:1) is not Superior to Thyroxine Alone to Improve Well-Being and Cognitive Performance in Hypothyroidism, *Clin Endocrinol*, 2004 June;60(6):750-757
3. Walsh, Dr. John P., Combined Thyroxine/Liothyronine Treatment Does Not Improve Well-Being, Quality of Life, Or Cognitive Function Compared to Thyroxine Alone: A Randomized Controlled Trial in Patients with Primary Hypothyroidism, *J Clin Endocrinol Metabol*, 88(10):4543-50.
4. Clyde, Patrick W, MD, Combination Levothyroxine/Liothyronine Shows No Obvious Benefit Over Levothyroxine Alone in Patients With Primary Hypothyroidism, *JAMA*, December 2003 as reported by Joene Hendry of *Doctor's Guide*.
5. Grozinsky-Glasberg S, Fraser A, Nahshoni E, Weizman A, Leibovici L., Thyroxine-Triiodothyronine Combination Therapy Versus Thyroxine Monotherapy for Clinical Hypothyroidism: Meta-Analysis of Randomized Controlled Trials, *J Clin Endocrin Metab*, 2006, 91(7): 2592-2599
6. Bunevacius, R MD PhD, Kacanavicius, G MD PhD, Zalinkinevicius, R MD, Prange, A MD, Effects of Thyroxine as Compared with Thyroxine plus Triiodothyronine in Patients with Hypothyroidism, *NEJM*, Feb 11, 1999, 340:424-429
7. Danzi S and Klein I, Potential Uses of T<sub>3</sub> in the Treatment of Human Disease, *Clin Cornerstone*, 2005, 7(S2): S9-S15
8. Bente C, Appelhof EF, Ellie MW, et al., Combined Therapy with Levothyroxine and Liothyronine in Two Ratios, Compared with Levothyroxine Monotherapy in Primary Hypothyroidism: a Double-Blind, Randomized, Controlled Clinical Trial, *J Clin Endocrinol Metabol*, 90(5):2666-2674.
9. Hertoghe T, Lo Cascio A., Hertoghe J. Considerable improvement of hypothyroid symptoms with two combined T<sub>3</sub>-T<sub>4</sub> medication in patients still symptomatic with thyroxine treatment alone. *Anti-Aging Medicine*, Ed. German Society of Anti-Aging Medicine-Verlag 2003- 2004; 32-43
10. Starr, Mark MD, *Hypothyroidism Type 2*, Mark Starr Trust, Columbia, MO, 2005
11. Lowe JC, *The Metabolic Treatment of Fibromyalgia*, McDowell Publishing Company, 2000
12. Barnes, B MD, *Hypothyroidism: The Unsuspected Illness*, Harper & Row, 1976

13. Baisier, WV, Hertoghe, J., Bee khaut, W., Thyroid Insufficiency? Is Thyroxine the Only Valuable Drug?, *J Nutr and Environ Med*, September 2001, 11(3):159-166
14. Gaby AR, Sub-Laboratory Hypothyroidism and the Empirical use of Armour® Thyroid, *Alt Med Rev*, 2004, 9(2)
15. Goldberg M, The Case For Euthyroid Hypometabolism, *Am J Med Sc* October, 1960 pgs 479-493
16. Goldberg M, Dagnosis of Euthyroid Hypometabolism, *Am J Obst & Gynec*, 81(5): 1053-1058, 1961
17. Federal Drug Administration NDA 10-379 for Cytomel®
18. Drs. Gross and Pitt-Rivers discovered the greater activity of triiodothyronine in 1952, see List 1 above.
19. The Diagnosis and Management of Primary Hypothyroidism, Royal College of Physicians, 2008
20. *Bolitho v City and Hackney Health Authority* [1997] 4 All ER 771.
21. Quote from Bolitho ruling: "However, the judgment in the case of *Bolitho* adds a subtle gloss to the *Bolam* test. In *Bolitho* the court declared that it was not bound to find for a defendant simply because he leads evidence from a body of experts who genuinely believe that the defendant's practice conformed to sound medical practice. The court will require further evidence that the practice proclaimed has a logical basis, and that the defendant practitioner has weighed up the benefits and risks. In other words, after *Bolitho* the defendant would have to justify his stance in addition to having this endorsed by similar responsible practitioners. Evidence-based medicine and clinical guidelines will begin to have a sharper focus in specifying the required standard of care."

## Incomplete Differential Diagnosis and Other Assertions

Differential diagnosis is an organized method of examining a patient. It is a process of elimination of potential causes of the symptoms of the patient from all possible causes. [1-3] This process is a *disjunctive syllogism*. [4] and begins with making a list of possible diseases that cause the symptoms. Thus, the syllogism begins with belief that one or more of the stipulated diseases are, in fact, the cause of the symptoms. (Unfortunately this is not the case for the symptoms of hypothyroidism.) Then the stipulated diseases are eliminated one by one through testing and clinical examination. Hopefully, there will be only one left after the elimination is done. Therefore it must be true if the list is complete. If there are more than one left, then the physician either treats them all or does more elimination tests. If there are none left, then the real cause was not listed originally, a fact not recognized by customary practice.

In diagnosing the symptoms of hypothyroidism, only one disease is suspect - hypothyroidism. If the TSH level is in the "normal" reference range, then endocrinology claims, albeit with the assumption that the pituitary gland is functioning properly, that a diagnosis of hypothyroidism - *the clinical consequences of deficient secretion by the thyroid gland* - cannot be made. Although the counterexamples clearly demonstrate that there are other alternatives, such as euthyroid hypometabolism, [5,6] that should be included in the differential diagnostic process, endocrinology errantly assumes that the post thyroid functions either never fail, [7,8] do not exist, or cannot be treated. [9] With these fallacious assumptions, endocrinology uses the diagnoses of *nonspecific symptoms* [8] and *functional somatoform disorders* [10] to excuse its diagnostic failures -13%, in thyroxine-only therapy. [11,12]

Customary practice is not realistic as it depends upon the lack of logic in the support for *nonspecific symptoms* and *functional somatoform disorders*. This lack of logic stems from improper uses and interpretations of citations. *Nonspecific symptoms* were offered by the American Thyroid Association (ATA) [5] by improperly citing Barsky. [13] The ATA attempted to prove that the symptoms that endocrinology could not manage were not related to hypothyroidism. But Barsky, et al., did not claim that patients with the symptoms of hypothyroidism were screened out. Consequently, the ATA is attempting to distance hypothyroidism from the remaining symptoms with data tainted with the symptoms of hypothyroidism. Similarly, *functional somatoform disorders* [10] are supported with three citations. [14-16] Like the basis for *nonspecific symptoms*, the *functional somatoform disorders* support is also tainted by the lack of screening against subjects with the symptoms of hypothyroidism. Thus, when endocrinology fails to suggest a test to find the cause of continuing symptoms, which the counterexamples demonstrate physically exist, endocrinology has an excuse for the failure of its customary practice. [17]

Similarly the ATA disparaged low basal temperatures [5] with a body temperature study [18] that also did not screen out subjects with hypothyroidism and claimed that low body temperature is just part of normality. This is quite unfortunate because, low basal temperatures are an indicator of potential hypothyroidism or hypometabolism [8,19] and the potential use of a proscribed T<sub>3</sub>-containing hormone replacement. [20]

The legal problem associated with improper differential diagnostics is invalid consent. A patient

should be advised of all potential alternatives. However, in the case of continuing symptoms of hypothyroidism when the thyroid gland secretion deficiency has been either ruled out or replaced, there is the potential for euthyroid hypometabolism [21,22] and invalid consent action.

## Endnotes Differential Diagnosis

1. Differential Diagnosis (DDX) Definition: *The distinguishing of a disease or condition from others presenting with similar signs and symptoms*, Merriam-Webster
2. Differential Diagnosis (DDX) *is a systematic method used to identify unknowns. This method, essentially a process of elimination, is used by taxonomists to identify living organisms, and by physicians and other qualified professionals to diagnose the specific disease in a patient. Not all medical diagnoses are differential ones: some diagnoses merely name a set of signs and symptoms that may have more than one possible cause, and some diagnoses are based on intuition or estimations of likelihood.* Wikipedia: [http://en.wikipedia.org/wiki/Differential\\_diagnosis](http://en.wikipedia.org/wiki/Differential_diagnosis)
3. Differential Diagnosis is a medical adaption of the process of elimination. These processes are based upon the logic of disjunctive syllogism, which is known from antiquity as *modus tollendo ponere*.
4. Geisler NL, Brooks RM, *Come, Let Us Reason*, Baker Book House, original printing 1990
5. Goldberg M, The Case For Euthyroid Hypometabolism, *Am J Med Sc* October, 1960 pgs 479-493
6. Goldberg M, Dagnosis of Euthyroid Hypometabolism, *Am J Obst & Gynec*, 81(5): 1053-1058, 1961
7. Garber JR, *Hypothyroidism Talking Points 2006*.
8. *Wilson's Syndrome*, American Thyroid Association, Nov 1999 updated May 2005
9. Testimony of Dr. AP Weetman at the Prosecution of Dr. Gordon Skinner, General Medical Council, Interim Orders Panel, Performance & Conduct, Regents Place, 350 Euston Road, London, NW1 3JN, Monday 7 August 2006
10. Weetman AP, Whose Thyroid Hormone Replacement is it Anyway? *Clin Endocrinol*, 2006;64(3):231-233
11. Saravanan P, Chau F, Roberts N, Vedhara K, Greenwood R, Dayan CM, 2002, Psychological Well-Being in Patients on "Adequate" Doses of L-Thyroxine Results of a Large, Controlled Community-Based Questionnaire Study, *Clinical Endocrinology*, 2002, 57: 577-585
12. Kaplan MM, Sarne DH, Schneider AB, In Search of the Impossible Dream? Thyroid Hormone Replacement Therapy That Treats All Symptoms in All Hypothyroid Patients
13. Barsky, Arthur J, MD and Borus, Jonathan F. MD, Functional Somatic Syndromes, *Ann Intern Med*, June 1999, 130(11): 910-921
14. Salmon P, Peters S, Stanley I, Patients' Perceptions of Medical Explanations for Somatisation Disorders: Qualitative Analysis, *BMJ*, 1999; 318:372-378
15. Mayou MA, Kirmayer LJ, Simon G, Kroenke K, Sharpe M, Somatoform Disorders: Time for a New Approach in DSM-V, *Am J Psychiatry*, 2005; 162:847-855
16. Sharpe M, Carson A, Unexplained Somatic Symptoms, Functional Syndromes, and Somatization: Do We Need a Paradigm Shift?, *Ann Intern Med*, 2001, 134:926-930
17. Aleksandar J, Rethinking Somato form Disorders, *Current Opinion in Psychiatry*, 18(1) 65-71, 2005
18. Mackowiak, et al., A Critical Appraisal of 98.6 Degrees F, the Upper Limit of the Normal Body Temperature, and other Legacies of Carl Reinhold August Wunderlich, *JAMA*, 1992, 268:1578-80
19. Barnes, B MD, *Hypothyroidism: The Unsuspected Illness*, Harper & Row, 1976
20. The Diagnosis and Management of Primary Hypothyroidism, Royal College of Physicians, 2008
21. Goldberg M, The Case For Euthyroid Hypometabolism, *Am J Med Sc* October, 1960 pgs 479-493
22. Goldberg M, Dagnosis of Euthyroid Hypometabolism, *Am J Obst & Gynec*, 81(5): 1053-1058, 1961

## Alleged Dangers of T<sub>3</sub> Therapies

There are two dangers alleged (without citation) [1] to be associated with the prescription of triiodothyronine (T<sub>3</sub>) containing hormone replacements: Excessive variations in serum T<sub>3</sub> levels and bone destruction or osteoporosis. Both have been discounted by studies.

The customary practice for the prescription of T<sub>3</sub> containing hormone replacements is a small dose three times daily rather than one equivalent dose per day. The rationale is to minimize the danger from the variation in blood levels of T<sub>3</sub> since the high clearance rate produces a short half-life of several hours. However, the hormonal action is not in the blood, but in the nuclei of the cells. [2] The effect of the hormonal action in the cells has a much longer half-life of about two days. [3] This suggests that there is no real danger in the prescription of T<sub>3</sub> containing hormone replacements. Counterexamples have demonstrated that, like all drugs, the overstated dangers of T<sub>3</sub> therapies can be managed successfully, just as T<sub>4</sub> therapies can be managed.

The other alleged danger is the production of osteoporosis. Customary practice warns against below "normal" levels of thyroid-stimulating hormone (TSH). However, TSH is well removed from the levels of T<sub>3</sub> in the cells' nuclei by three functions, thyroid gland secretion, peripheral metabolism, and peripheral cellular hormone reception. The true measure is the level in the cells. Although that is yet to be measured clinically, a better indication is thyrotoxicosis. [4] Thyrotoxicosis increases bone turnover, accelerates bone loss, and causes osteoporosis. By general consensus, excessive hormone can cause osteoporosis. [4-9] However, the question of where the assay is taken is still a question to be resolved. It should be near the function in question. [2]

### Endnotes - Dangers

1. *Wilson's Syndrome*, American Thyroid Association, Nov 1999 updated May 2005
2. Ridgway EC, Food and Drug Administration Joint Public Meeting on Bioequivalence of Levothyroxine Sodium, Monday, May 23, 2005, pages 144-145
3. Danzi S, Ojamaa K, and Klein I, Triiodothyronine-Mediated Myosin Heavy Chain Gene Transcription in the Heart, *Am J Phys Heart Circ Physiol*, Feb 27, 2003
4. Bassett JHD, O'Shea PJ, Sriskantharajah S, et al., Thyroid Hormone Excess Rather than Thyrotropin Deficiency Induces Osteoporosis in Hyperthyroidism, *Molecular Endocrinology*, 21(5), 1095-1107
5. Stern PH, Mechanisms of Thyroid-Induced Osteoporosis, Northwestern University, Oct 2000, <http://oai.dtic.mil/oai/oai?verb=getRecord&metadataPrefix=html&identifier=ADA391248>
6. Thomasson WA, Thyroid Supplementation Does Not Increase Osteoporosis Risk, Doctor's Guide, June 17, 2000, <http://www.pslgroup.com/dg/1D62E2.htm>
7. Nuzzo V, Lupoli G, Del Puente EA, Rampone E, et. al., Bone Mineral Density in Premenopausal Women Receiving Levothyroxine Suppressive Therapy, *Gynecol Endocrinol*, 1996 12(5): 333-7
8. Grant DJ, McMurdo ME, Mole PA, Paterson CR, Davies RR, Suppressed TSH levels secondary to thyroxine replacement therapy are not associated with osteoporosis., *Clin Endocrinol (Oxf)*. 1993 Nov;39(5):529-33.
9. Svanberg E, Healey J, Mascarenhas D. Anabolic effects of rhIGF-I/IGFBP-3 in vivo are influenced by thyroid status. *Eur J Clin Invest*. 2001 Apr;31(4):329-36

## Conclusions

1. The thyroxine-only therapy is reasonable for those patients who do not have concurrent mimics of hypothyroidism, such as Chemically Euthyroid Hypometabolism, which produce continuing symptoms in spite of proper replacement of thyroxine and normalized TSH.
2. Mimics of hypothyroidism, such as CEH, can occur with or without concurrent hypothyroidism.
3. The scope of thyroid gland function tests is too narrow to detect mimics of hypothyroidism. Additional tests are needed to serve patients properly and efficiently.
4. There are counterexamples (studies, study subjects, and individuals) to the thyroxine ( $T_4$ ) only diagnosis and treatment customary practice because the application of that practice is not limited to only the thyroid gland. These counterexamples demonstrate continuing symptoms with normalized TSH are not functional somatoform disorders, but can be successfully treated.
5. There have been indications of the inadequacy of the  $T_4$  only therapy for more than 60 years.
6. Endocrinology knows, knew, should know, or should have known of the medical science, which predates 1971, and which describes bodily functions that cause the symptoms of hypothyroidism when they are deficient.
7. The differential diagnostic protocol for the symptoms of hypothyroidism is flawed because not all the causes of these symptoms are used in that process.
8. The studies that support the  $T_4$  only therapy can not be scientifically extended to mimics of hypothyroidism.
9. Endocrinology has ignored standards of care in the authorship of medical practice guidelines and produced unclear directives, which have been interpreted by most physicians to the detriment of many patients with mimics of hypothyroidism. If these authorship standards of care had been followed and logical consistency maintained, these patients would not be and would not have been suffering chronically and unnecessarily.
10. In the theory of self-regulation, medical practice cannot abuse patients systematically. But such abuse exists for many.

## Appendix A - Stories of Counterexamples

1. **Patient MH** approximately 20 years ago MH had a full thyroidectomy due to papillary cancer at the age of 30. She can recall that prior to her operation she felt "pretty well" and therefore had faith in her consultants words that she would regain her optimum health on thyroid replacement therapy, being prescribed levothyroxine. This was not the case, instead within 3 months she felt lethargic, mentally fatigued, and was tired all the time. Despite doctors assurances she did not improve; her health deteriorated, her weight increased by 3 stone, she was irritable and unable to tolerate the slightest physical exertion such as climbing the stairs. Furthermore her social life ceased to exist as the severe "brain fog" made it too difficult to have lengthy conversations. Her employment was at risk as unable to get going in the morning she was reprimanded regularly for being late. MH felt that with such low energy and so mentally fatigued that she could not contemplate starting a family.

On levothyroxine, MH presented with normal blood tests. Not only was she never offered a consultation with an endocrinologist, she wasn't even aware such a speciality existed. Changing doctors did not alter her situation. In her own words, she says " &that the best the thyroxine did was to keep me alive, nothing more, nothing less &"

It was through her own research on the internet that MH came across TPA-UK and the information on Armour® Thyroid. She procured this medication privately and within weeks her sense of humour returned, the mental fog and physical exhaustion lifted. She found her energy returning and her outlook on life brighter. She considers, now, that her health is nearly restored, and states that her " &brush with cancer was far easier to cope with than the 18 years of torment that I have lived through with severe hypothyroidism, due to my personal experience of the incompetence towards this serious condition within the NHS."

*Patient MH is a counterexample.*

2. **Patient PK**. Before the birth of her second child, she describes her energy as boundless. In 1990 she began loosing her hair as well as her eyebrows, her gained and lost weight in extremes and sunk into a deep depression. The effect on her relationship and family was devastating she separated from her partner. Unable to cope with being a parent to two children her daughter lived with her father and her older son stayed with her. The pain and shame from this was unbearable although it hadn't occurred to her that she may be ill. In contrast to many patients, patient PK was exhausted but couldn't stop moving.

When she finally went to the doctors they diagnosed her as depressed and prescribed anti-depressants. These did not make patient PK feel any better but the doctors told her they could find nothing else wrong with her. Meanwhile she continued to work, but only part time and only jobs that required little mental effort or energy. During this time she also noticed that she was chronically cold and her periods were so excruciating that she had to take a week off work every month; she slept approximately 18 hours a day and felt at times she was slipping into a coma. Eventually even part time work was no longer possible.

After fifteen years, one doctor decided to investigate her thyroid function. She was called in urgently to her surgery, given a diagnosis of hypothyroidism, a prescription for levothyroxine,

and the hope that life worth living would return.

This was not the case. Even though she increased her dose of levothyroxine to 200mcg, she felt only slightly better than before and continued to put on weight. A consultation with a private endocrinologist proved pointless, although she was diagnosed with chronic fatigue syndrome.

Patient PK continued to take control of her own health and so found Thyroid Patient Advocacy-UK on the internet. She began to self treat with Armour® thyroid as well as treat her low adrenal function with hydrocortisone. Within a couple weeks her body temperature increased from 35.1 to a normal 37 degrees Celsius. She lost weight and gained a rosy colour in her face, and started her own business, ending her near lifetime dependence on state benefits. Perhaps most importantly she has been able to help her daughter, who also has hypothyroidism before she had to endure a lifetime of suffering.

*Patient PK is a counterexample.*

3. ***Patient JJ.*** Suffering from fatigue for many years patient JJ was diagnosed with ME/ CFS and received cognitive behavioural therapy. She did however come into contact with a nutritionist who helped her getting private thyroid and adrenal tests, which showed low functioning thyroid and adrenal glands. She is currently taking hydrocortisone and has felt better in just a few weeks than she has in 20 years.

Patient JJ points out that this has all been at her own expense and that the ignorance of the NHS in these matters is scandalous. Furthermore she observes that the scale of the problem must be huge, she can think of at least six friends who would all fall into a diagnosis of hypothyroidism. It is, she concludes, a disgrace.

*Patient JJ is a counterexample*

4. ***Patient LL.*** Patient LL was diagnosed with hypothyroidism about 25 years ago, given levothyroxine and initially felt well. Slowly ill health crept up on her and she complained to her doctor of various problems: her legs, feet and ankles swelled up badly, she had plantar fasciitis, needed two operations for frozen shoulder, pins and needles in her arms, and severe constipation. She was so exhausted she would fall asleep in mid- sentence. A consultant diagnosed her with diverticular disease at that time; however several years later it was found she did not have this at all. Her thyroid function tests were within range and the doctor did not pursue any other avenues. She has wondered if secretly her doctor knew her problems were thyroid related but his hands were tied.

At a private clinic, she had a full range of thyroid tests, which were all found to be low. Particularly her T<sub>3</sub> levels and B12. The GP said they do not take notice of T<sub>3</sub> and thought she should increase her levothyroxine to 150mcg. She was also diagnosed with pernicious anaemia. Her GP also wanted to prescribe Prozac and statins which she refused. After a few months the tiredness returned and she failed to lose any weight.

Patient LL saw a private nutritionist as her GP seemed to have washed his hands of her. Tests revealed she had a conversion problem and the nutritionist gave her a prescription for T<sub>3</sub>.

Although her GP was angry, she continued to feel better. A new GP was also not happy about her thyroid medications but was content to leave this in the hands of the private doctor. But she wasn't happy about having to get treated privately, especially when the private doctor relocated and she could only get prescriptions by post.

Patient LL began to buy T<sub>3</sub> herself but found it difficult. Fortunately she did find out about Armour® and for about 2 years she took T<sub>3</sub> and levothyroxine and for a further 3 years took Armour®. During these five years she gradually got better and better and had forgotten about bowel problems, numb hands and arms, feeling tired. She lost weight, she slept well, her cholesterol decreased and she easily managed her blood sugar levels. She says, *"I just lived, had a good quality of life, went out with friends, and went on holiday."*

Once again however the GP was unhappy about her self medication and said that unless she would agree to take just 100 mg of levothyroxine he would cease to be her GP. He insisted that she was over medicated despite her return to health and her lack of any signs of hyperthyroidism. She felt no choice but to acquiesce to his demands. Within a few months she could hardly walk, she gained weight, the tiredness returned as did her pins and needles and frozen shoulders. Her hair began to thin and her legs, ankles and feet swelled up again, she was constipated, breathless and depressed. Her bowel problems were so severe she had to take into consideration this when making any plans to leave the house. Her blood pressure also increased and she was prescribed medication for this. She was about to get a wheelchair. She felt that she was bombarded by health problems.

Her energy was so low she says, "If I got the energy to make myself a cup of tea I didn't have any energy left to drink it." Her GP hypothesised that her fatigue was due to sleep apnoea. At a sleep clinic it was found she had only the mildest case of sleep apnoea.

The hospital doctor agreed with the GP that patient LL should go on thyroxine alone, regardless of her trying to explain how she was so much better on Armour®, or even T<sub>3</sub>. But the most insulting of all was to be told that the consultant did indeed prescribe T<sub>3</sub> but only to patients who had moved into this area but who had been prescribed it by another consultant from the area they had come from. The consultant and the GP took no regard to the fact that she had been prescribed it and felt well on it for the past 5 years.

In November a new consultant prescribed a minute dose of T<sub>3</sub> for patient LL and in exactly one month there was an immediate improvement. Her bowels normalised, her hair stopped falling out, her hands and arms were no longer numb, nor was she tired during the day. The sleep clinic said there was no point in her attending anymore and discharged her. She no longer needed pills for her blood pressure and so the breathlessness ceased.

Patient LL describes that when she is being medicated properly that she is "unaware of my body & everything is working OK, but as soon as I am not medicated properly I am aware of every part of my body, because every part of my body is affected in one way or another." She feels that the GP is prepared to prescribe to excess many medications such as painkillers and statins and blood pressure pills, regardless of the consequences, yet she was told to stop Armour® and T<sub>3</sub> therapy because of the perceived and unproven consequences

*Patient LL is a counterexample.*

5. **Patient JL** Although JL was ill with a hormone imbalance following the birth of her second child, her GP said that, "as she was a sensible woman she would be fine." An herbalist helped her through the next difficult six years. She struggled to look after her children, husband and home.

Many times she went to her GP with a list of symptoms, sometimes these were not even looked at and at no point did any GP commission thyroid tests. One GP said that she could tell a hypothyroid patient just by looking at them and Judith could not be hypothyroid. Her continuing gynaecological problems saw her under the care of St. Mary's Women's hospital and it was there in 1993 that a young doctor suspected thyroid problems. He was incredulous her thyroid had never been checked. Unfortunately the blood tests were in range and the GP again insisted that she could tell she wasn't hypothyroid just by looking at her.

Without a diagnosis or treatment her health declined to the point where she could barely function; she couldn't make the short walk to her children's school so took them in the car, if she caught a cold she couldn't recover. Her GP diagnosed depression and advised that she be more assertive with her husband. In her own words, "Somewhere came the strength to say no I'm not depressed I'm ill, I feel low because I am so ill I can't function."

The GP acquiesced and order new blood tests. She cannot forget the day she went in to discuss them with the GP. The GP flung the tests across the table and said, "There! That's what your problem is." There was no apology, no explanation but there was a prescription for thyroxine. Judith remains hurt and puzzled by the offhand and disrespectful manner of the doctor.

Ten years later, she began to struggle again with her old hypothyroid symptoms returning. It is suggested she is menopausal or perhaps this is her age, or its stress, or its bereavement. She keeps struggling on as the blood tests confirm she is biochemically euthyroid. Fortunately, she found out about Thyroid Patient Advocacy-UK. Unable to get tests for T<sub>3</sub> on the NHS, She began to self treat with Armour®. She says she can now see how ill she had become again; so much has her health improved. She feels that return to T4 therapy alone would result in ill health again, but she is concerned she won't always be able to afford Armour®.

*JL is a counterexample.*

6. **Patient ST** For several years, Patient ST remained ill on levothyroxine only and suffered with severe debilitating pain in her lower back, shoulders and under both heels. She remained cold, with brain fog and short term memory and became so weak, when she broke her leg, her husband had to hire a wheelchair as she hadn't the strength to hold herself up on crutches. Eventually, she asked her GP to refer her to an endocrinologist as she knew she could no longer continue with such symptoms and ill health. The endocrinologist never examined her and only looked up from her desk to stare out of the window. Because her Free T<sub>3</sub> was very low, her 125 mcgs levothyroxine was decreased to 50 mcgs and 20 mcgs liothyronine (T<sub>3</sub>) was added. She had a very bad reaction to this and felt she would lose consciousness with heart rate dropping to 45 bpm with missing heart beats.

Patient ST telephoned the endocrinologist who told her that it could not be her medication and must be something else and that she should telephone her GP. She decided that she could take no more from the NHS and made an appointment with a private hormone specialist. Because he saw that she had a conversion problem and needed other thyroid hormones, he gave her a private prescription for Armour® Thyroid. It was only 9 days after starting Armour® before her symptoms started to disappear. Her pains went and she got back her brain. Because Armour® was expensive (She is a pensioner), she decided to ask her GP if she would prescribe it within the NHS. Her GP refused, saying that had an NHS consultant recommended it, she would have been happy to prescribe it. She persuaded her GP to refer her to another endocrinologist, who also refused to recommend Armour® for reasons that she knew were incorrect.

Patient ST started to research and found the information necessary that would show her endocrinologist the reasons why he was wrong, and after he read it, he decided that he would now recommend Armour® for her. However, when she next met her GP, the GP refused to prescribe it as previously promised, saying instead that it was the policy of their practice never to prescribe unlicensed medicine. She argued that there should always be a choice of medication in case one couldn't tolerate the only licensed medication and as there was no other licensed choice, the practice should make exceptions. The following week, she received a letter from the Head of Practice saying that because she had "criticised" their practice, they felt it would be better if she found another doctor in another practice. Patient ST and her husband had been with this practice for 20 years.

Patient ST did find another doctor who agreed to prescribe Armour® Thyroid for her because it had been recommended by her endocrinologist. She quickly regained her normal health and has been taking Armour® successfully for 6 years. Because of her great success in regaining her normal health, her endocrinologist started to prescribe Armour® for other patients who were not doing well on the NHS levothyroxine therapy. He also had discussions with other endocrinologists within the same county who also started recommending Armour® for some of their patients with success.

However, after the RCP et al. new guideline on the management of hypothyroidism, Patient ST and all the other patients treated by the same endocrinologist was summoned for a consultation, to be told that he had received information from the RCP and he would no longer be in a position to recommend Armour® Thyroid for her or the other patients any more. He said that he had his career and livelihood to think about and that he could not put these at risk. He said he was very sorry, but his hands were tied. She wrote a letter to him setting out the reasons she should not have her medication taken away and begged him to reconsider his decision. She knew she would once again become very ill. Some 2 months later, She was summoned to his office yet again. He was beaming and told her that he had spoken to the President of the RCP and that the president had given him special dispensation to carry on recommending Armour® for her (and for his other patients). He told her that this was only until the RCP had reviewed the information received from many doctors, researchers, patients and thyroid support forums. He also told her that she should not broadcast this, as he was only doing this for those patients already using Armour®, but that he would not, and could not recommend Armour® for any new patients. She mentioned that this would surely create a two tier system, but he said it would not.

Patient ST is aware that the RCP has decided not to change their original guideline and is now extremely frightened and concerned that once again, she, and the other patients will have their Armour® taken away yet again. She had to use Armour® Thyroid because she remained very ill on levothyroxine, and at any minute, she could be forced into having to take this synthetic medication yet again. She is frightened and angry that the RCP has put her health at great risk and also, that her endocrinologist has been put in such a situation. She persuaded her endocrinologist to recommend Armour® for her, it made her well, then she had it removed, and then it was given back to her, and now it could be removed again & All she can do is to wait for the next summons to her endocrinologist's office. She is naturally very afraid for her future.

*Patient ST is a counterexample.*

7. **Patient LM** For approximately the past three years her GP has more or less implied that her problems were all in her head. He kept trying to prescribe anti-depressants to her. However, after much insistence on her part she was referred to an endocrinologist privately, who diagnosed hypothyroidism. She was prescribed levothyroxine but had problems with this. After seeing another private doctor she began self medicating with Armour®. Her GP agreed he could give her a private prescription but openly admitted that he could not give her an NHS prescription because of the problems with the RCP et al. He also disagreed that she could possibly have adrenal insufficiency.

In her previous employment as a medical translator she used to make notes of the reference ranges in other countries. She notes with some dismay that in many countries patients are diagnosed with hypothyroidism because of the tighter reference ranges. She tries to work with her GP but she can see his hands are tied and that there is hidden agenda. She feels that she has had virtually no help from the NHS in getting better.

*Patient LM is a counterexample.*

8. **Patient ML**. Patient ML has a family history of thyroid problems and she recalls her own childhood of near chronic illness. When she hit puberty her periods were always very heavy and very painful and by the time she was married she always felt tired. Over the years she became ill with depression, anxiety, extreme tiredness, and could only work part time. Many visits to the doctor only resulted in a prescription for anti-depressants. At age 21 she had developed a swelling in her neck but it was not until age 29, when she couldn't swallow and had lost weight. At this time thyroid illness was not mentioned although concerned doctors speculated this could be a tumour in her neck.

Patient ML had a radioactive iodine scan of her throat but continued to be diagnosed with psychiatric illness, even when she collapsed one day with an extremely fast heart rate and a total numbness in her body. She still had the swelling in her neck and also began getting migraines in addition to her other symptoms. For some periods of migraine attack she wouldn't be able to see for 30 minutes or more.

The pattern of illness changed markedly by 1995 when patient ML, who had always been very thin, with a problem of weight loss, began to gain weight. As well she began to lose her hair. Soon she was too weak, too tired and too ill to walk anywhere or to care for her children and

husband. She became clumsy, was always cold and constipated with additional digestive problems like nausea. Again her doctors put her on anti-depressants. She also complained of breathlessness for which her doctors sent her to asthma clinic.

It was the doctor at the asthma clinic who on confirming her lung function to be fine, suspected hyperthyroidism. The test results were sufficient for her to be sent to see an endocrinologist who confirmed Hashimoto's disease (antibodies which progressively destroy the thyroid gland). Unfortunately, she was discharged without an explanation of her condition nor treatment. She felt her marriage in jeopardy due to her ill health and as well she had been retired from her job on medical grounds.

By 2006 patient ML was very ill; she was too weak to walk and suffered near constant migraines. Blood tests confirmed the level of her antibodies was very high but she didn't understand what this meant. Nevertheless finally she was given a prescription for levothyroxine and referred back to her endocrinologist. Unfortunately, she had a bad reaction to levothyroxine but even so the endocrinologists merely increased her dose. Discharged back to her GP finally some of her symptoms subsided although she still was chronically weak and exhausted.

Within two short years however her old symptoms returned, plus new ones. She realised from her own research and from patient groups that she was developing symptoms of toxicity. She was told at this time that she had chronic fatigue syndrome. She asked at the endocrine unit if she could have Armour® thyroid or T<sub>3</sub> therapy. She was told here that there was no proof these were effective treatments and in fact had also been told that they had never heard of these treatments.

By 2009 she decided to self medicate with Armour®, purchasing it privately over the internet. Initially she soon began to feel very well until her weak adrenals caused such complications that presently she has stopped all thyroid medications. She feels she is in a quandary as she cannot afford to see a private doctor. She is awaiting blood tests but still suffering, and feeling frustrated at being forced into self- treatment.

*Patient ML is a counterexample.*

9. **Patient SS** P&E's experience is through their eldest son. Ill for the first 5 years of his life, he was diagnosed with ME by the time he was nine years old. Some five years after this initial diagnosis he was still an extremely ill child. He missed all his secondary schooling and E gave up her income and indeed her life to be his carer.

However, at age 18 a private doctor began treating him with Armour® and the improvements were nothing short of a miracle. From being bed bound their son walked up the Eiffel tower, and soon achieved the same things others his age did such as learning to drive. On the AYME scale his recovery in just one year went from only 5% ability to 90%.

P&E report that their son is now at Art College and although he has some bad days overall he is achieving well. They estimate that he is about 90% well due to small multi-hormone dosages. The miraculous recovery and return of their son is entirely paid for privately. Neither the GP nor the PCT will recognise their son's illness and his necessary treatment. In fact twice the PCT

were approached and twice they have refused the P&E's any assistance with their son's treatment. They say that they have given up on the NHS; it does not have sufficient knowledge to diagnose and treat their son. Their hope that the medical establishment will be enlightened about over reliance on blood tests and about peripheral metabolism and peripheral cellular hormone reception, as well as treatment with natural desiccated thyroid extract so that people will be returned to health, lead better lives and contribute again to society.

*Patient SS is a counterexample.*

10. **Patient AA** **Patient AA** visited her GP in July 2006 after many months of feeling generally unwell. After asking her many questions about her lifestyle in particular her sex life he suggested she may be HIV positive and sent her for blood tests. She was terribly shocked and distressed but the blood tests did not show she had HIV but rather that she had an under active thyroid. She was relieved and was immediately given a prescription for levothyroxine. A consultant confirmed the diagnosis in October but her health deteriorated despite her dose being increased to 200mcg. So severe was her depression that on one occasion she was asked by her doctor to fill out a suicide form.

Almost a year after her initial consultation there was still no improvement and the consultant recommended anti-depressants. Feeling that this was no solution, she refused, as she did with the offer of psychological counseling. Instead she convinced the consultant to give her a trial of levothyroxine and T<sub>3</sub>, although the consultant was not keen. Having immigrated, she complained to her new GP of breathlessness, who said that perhaps her breathlessness was because she was unfit; he did not investigate. A change of doctors again resulted in another referral to the endocrinology department.

Two weeks before her hospital appointment patient AA herself concluded that for whatever reason her thyroxine treatment was giving her intolerable side effects and she stopped the medication. The endocrinologist convinced her to try again and within one week of starting levothyroxine the side effects returned with a vengeance. She conveyed her experience in a letter to the endocrinologist emphasising that the side effects were both emotional and physical. She felt the consultant seemed unwilling to listen as he insisted she continue with levothyroxine.

In July 2008, patient AA requested a trial of Armour®, and she left with the endocrinology unit with the impression that the consultant was amenable to this suggestion. However, the letter in reply to this request stated that the consultant did not recommend Armour® and her GP could instead, if he chose, refer her to someone who would prescribe it. She feels that she is yet another of the NHS cast offs, as her GP has told her that if she is unable to tolerate levothyroxine there is nothing more he can do to help her. Disillusioned with the NHS, she was forced to seek help from private doctors, buy her own medication and indeed self-medicate. She now feels that she is in the worrying situation where she actually knows more about her condition and medication than her doctors. She finds the lack of support, compassion, understanding & willingness to listen appalling as well as the lack of choice in treatment.

*Patient AA is a counterexample.*

## Appendix B - Ignoring Medical Ethics

Additional statements of medical ethics from around the world deplore the continuing suffering by victims of mimics of hypothyroidism imposed by current medical practice. Patients are to be shown great respect and dignity as the first priority of medicine:

***The Health of my Patient Will Be My First Consideration.*** The Declaration of Geneva (1949, 1968, 1983)

***A Physician Shall, While Caring for a Patient, Regard Responsibility to the Patient as Paramount.*** American Medical Association (2001)

***A Physician Shall Owe His/Her Patients Complete Loyalty and all the Scientific Resources Available to Him/Her.*** World Medical Association (1949, 1968, 1983)

If the well-being of patients is paramount, then the discovery of the etiologies of continuing symptoms should be found according to the protocols of Differential Diagnosis and Informed Consent. Should the etiologies require a triiodothyronine (T<sub>3</sub>) containing hormone replacement, it should be prescribed.

***A Physician Shall Be Honest in all Professional Interactions.*** American Medical Association (2001)

Denying further medical investigation by claiming the patient has *nonspecific symptoms* [1] is neither fair nor honest if mimics of hypothyroidism have not been investigated as they can be [2-4] and should be by the differential diagnostic protocol and informed consent rules.

***A Physician Shall Continue to Study, Apply, and Advance Scientific Knowledge, Maintain a Commitment to Medical Education, Make Relevant Information Available to Patients, Colleagues, and the Public.*** The American Medical Association (2001)

The medical knowledge of post-thyroid deficiencies, peripheral metabolism and peripheral hormone reception, has generally not been applied. The withholding of this information from patients and the public may be the cause of substantial suffering by people being treated for hypothyroidism. [1] There is no commitment to the medical education of these post-thyroid etiologies. [5,6] In fact, this knowledge is being dismissed or ignored completely [5-11] as the many victims with mimics of hypothyroidism continue to suffer greatly.

Medical knowledge gained by long-term observational studies are routinely ignored in favor of the gold-standard, double-blind, randomized, placebo-corrected clinical trials. In areas that cannot demand the great investment of such trials, observational studies should be considered because they do get similar results. [12] Ignoring history for the sake of the clinical trial ideal is quite wasteful of lifelong dedication [2,13,14] and the well-being that it can achieve. [3]



13. Starr, Mark MD, *Hypothyroidism Type 2*, Mark Starr Trust, Columbia, MO, 2005
14. Barnes, B MD, *Hypothyroidism: The Unsuspected Illness*, Harper & Row, 1976
15. Nikoo MH, *Cardiovascular Manifestations of Hypothyroidism*, Shiraz E-Medical Journal, Vol 2, No. 1  
<http://www.sum.s.ac.ir/semj/vo12/jan2001/hypothy&heart.htm>
16. Hak AE, Pols HAP, Visser, TJ, et al., *Low Thyroid Function Without Symptoms as a Risk Indicator for Heart Disease in Older Women*, Annals of Internal Medicine, Vol 132, Issue 4, Page 270-278, 15 Feb 2000
17. Camacho PM, Dwarkanathan AA, Sick Euthyroid Syndrome, *Postgraduate Medicine*, Vol 105, No 4, April 1999
18. Canaris GJ, Manowitz NR, Mayor G, Ridgway EC, *The Colorado Thyroid Disease Prevalence Study*, Archives of Internal Medicine, Vol 160, No 4, Feb 28, 2000
19. *Thyroid Problems Increase Risk of Heart Disease and Death*, American Thyroid Association, Oct 1, 2004
20. Kvetny J, Heldgaard PE, Bladbjerg EM, and Gram J, Subclinical Hypothyroidism is Associated with a Low-Grade Inflammation, Increased Triglyceride Levels, and Predicts Cardiovascular Disease in Males Below 50 Years, *Clinical Endocrinology*, Vol 61 Issue 2, Page 232, August 2004
21. Iervasi G, Pingitore A, Landi P., et al., *Low-T<sub>3</sub> Syndrome A Strong Prognostic Predictor of Death in Patients With Heart Disease*, Clinical Physiology Institute, American Heart Association ©2003
22. Danzi S, Ojamaa K, and Klein I, Triiodothyronine-Mediated Myosin Heavy Chain Gene Transcription in the Heart, *American Journal of Physical Heart and Circulatory Physiology*, Feb 27, 2003

## Appendix C - Technology Committee Preference for the Daubert Rule

The Daubert Rule [1] was created by the US Supreme Court to be able to better judge the admissibility of evidence. It is used to disqualify unscientific and unreliable evidence. It is based partially upon the philosophy of Sir Karl Popper on science and partially on customary practice. [2,3] This rule is recommended for adoption by the House of Commons Science and Technology Committee in conclusion #53: [4]

*"The absence of an agreed protocol for the validation of scientific techniques prior to their being admitted in court is entirely unsatisfactory. Judges are not well-placed to determine scientific validity without input from scientists. We recommend that one of the first tasks of the Forensic Science Advisory Council be to develop a 'gatekeeping' test for expert evidence. This should be done in partnership with judges, scientists and other key players in the criminal justice system, and should build on the US Daubert test." (Paragraph 173)*

*"173. Professor Sir Alec Jeffreys also expressed his concern about the lack of established protocol in this country for deciding whether to admit scientific evidence. ACPO is similarly unhappy with the current situation: To a large extent we are at the mercy of the criminal justice system as we have no agreed method of getting new techniques validated, and refers to the US Frye and Daubert hearings as an interesting development. We are aware that dogged adherence to criteria such as those commonly used in the US could stymie the use of less mainstream, but nonetheless valid, expert evidence. However, the idea of an objective, clearly defined test to establish whether a theory or technique is sufficiently robust and evidence-based to merit admission in court is highly attractive. **The absence of an agreed protocol for the validation of scientific techniques prior to their being admitted in court is entirely unsatisfactory. Judges are not well-placed to determine scientific validity without input from scientists. We recommend that one of the first tasks of the Forensic Science Advisory Council be to develop a gate-keeping test for expert evidence. This should be done in partnership with judges, scientists and other key players in the criminal justice system, and should build on the US Daubert test.** The development of such a test would complement the increasing emphasis on pretrial hearings in England and Wales discussed in paragraph 151." (Emphasis theirs)*

This report describes the Daubert Rule or test thus:

*"172. Most states in the US follow well defined procedures to establish whether evidence from a particular scientific technique should be admitted. According to the Frye test (named after the defendant in a murder case in 1923), courts can only admit evidence derived from novel scientific techniques once the technique has gained general acceptance in the scientific community to which it belongs. The test entails first identifying the field in which the theory underlying the new technique falls, and then determining whether the principle of the technique is widely accepted by most members in this field. Most states now also apply the*

*Daubert test to scientific or technical expert evidence. The Daubert principles require expert testimony to be tested against four criteria:*

1. *Whether the theory or technique can be (and has) been tested;*
2. *Whether the theory or technique has been subjected to peer review and publications;*
3. *In the case of a particular technique, what the known or potential rate of error is or has been; and*
4. *Whether the evidence has gained widespread acceptance within the scientific community."*

The adoption of the Daubert Rule is not a great leap. It has been preceded by the *Bolitho* ruling [5] superceding the *Bolam* test. The *Bolitho* ruling declares that the court is not bound by customary practice. It demands further evidence of a logical basis for the practice and for the choices made. The benefits and risks must have been assessed. The *Bolitho* ruling puts a greater emphasis upon evidence-based medicine and clinical guidelines.

## **Endnotes Appendix C**

1. *Daubert v. Merrell, Dow Pharmaceuticals*, (509 US 579)
2. Popper KR, *Conjectures and Refutations*, 1963, pgs 33-39 excerpted on the internet at [www.stephenjaygould.org/ctrl/popper\\_falsification.html](http://www.stephenjaygould.org/ctrl/popper_falsification.html) and reprinted Routledge Classics, 2003, pgs 43-51
3. Sir Karl Popper was knighted by Her Majesty.
4. *Forensic Science on Trial*, Seventh Report of Session 2004-05, House of Commons Science and Technology Committee, 16 March 2005
5. *Bolitho v City and Hackney Health Authority* [1997] 4 All ER 771.

## Appendix D - Definitions

The language describing thyroid function and hypothyroidism is imprecise, definitely not clear. This can be seen in the definitions of common terms.

Term	Definition(s)
Countereample	An example that disproves a theorem or proposition <i>Webster's New Collegiate Dictionary</i>
Hypothyroidism	<ol style="list-style-type: none"> <li>1. The linguistically proper and narrow definition is <i>The clinical results of deficient thyroid gland secretion</i>. This definition is only associated with the thyroid gland.</li> <li>2. An improper but often used and broad definition is <i>The clinical results of deficient thyroid hormones in the body</i>. This definition is associated with all functions that can cause deficient thyroid hormones in the body.</li> </ol>
Chemically Euthyroid  Chemically Euthyroid Hypometabolism	<p>The thyroid gland function test indicates "normal", or by hormone replacements, effectively "normal" thyroid function. However, the patient may have symptoms of hypothyroidism caused by mimics, which are not tested.</p> <p>One such cause of symptoms is Chemically Euthyroid Hypometabolism.</p>
Clinically Euthyroid	The patient presents no symptoms of thyroid dysfunction. Being not clinical euthyroid suggests dysfunction with any function that can cause abnormal levels of thyroid hormones in the body.
Euthyroid Hypometabolism	Deficient metabolism without thyroid dysfunction. This malady is a source of false negative results of tests of the symptoms of hypothyroidism.
Mimics of Hypothyroidism	Deficiencies in functions other than the thyroid gland that produce the same symptoms (or list of symptoms) as hypothyroidism. Mimics of hypothyroidism were previously known by thyroxine-resistant hypothyroidism or type 2 hypothyroidism, but they, strictly speaking, are oxymorons.
"Normal" Blood Tests	What is "normal" is quite dependent upon in which country the test is being performed. It varies over a broad range. This variance was created with the unfounded assumption that 2.5% of the population is hypothyroid; 2.5% hyperthyroid; and 95% normal.
Post Thyroid Function or Exo-Endocrine Function	<p>The bodily functions that act upon thyroid and thyroid related hormones after they are secreted by the thyroid gland. For example:</p> <ol style="list-style-type: none"> <li>1. Peripheral metabolism of conversion of thyroxine (<math>T_4</math>) to triiodothyronine (<math>T_3</math>) and reverse triiodothyronine (<math>rT_3</math>).</li> <li>2. Peripheral cellular hormone reception</li> </ol>
Thyroid	<ol style="list-style-type: none"> <li>1. (noun) The gland, the thyroid gland.</li> <li>2. (adjective) anything relating to the thyroid gland, hormones and symptoms. However, this is often misused, for example: Triiodothyronine (<math>T_3</math>) is a thyroid hormone in spite of most of it being produced by the liver.</li> </ol>
Thyroxine-Resistant Hypothyroidism	Symptoms of hypothyroidism that are not managed by levothyroxine sodium. Now known as mimics of hypothyroidism