How Low Metabolism Affects Our Health©

This handout was developed to help you determine if low metabolic energy/low body temperature is having an impact on your health. A glance at the list of symptoms table will quickly help you determine if this article might be useful for you.

If you find that the chart of symptoms includes many of your symptoms, start graphing your temperatures <u>now</u> (instructions at back of this article). This will help Dr. Rind choose the appropriate treatment plan, should you decide to treat the condition.

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Synopsis

Note: Some patients prefer to read the synopsis only. Others, who wish to obtain more detail, will also read the detailed version, which follows the synopsis. Please review the temperature charting instructions at the back of this article.

This is a brief overview of my approach towards identifying and correcting metabolic energy problems. For individuals who want to gain a deeper understanding of this approach, please see the detailed version of this article. – Bruce Rind, M.D.

Symptoms from Low Metabolic Energy

Although many of the symptoms below seem unrelated, they may all stem from the same root problem of low metabolic energy.

General	Low body temperature. Coldness. Low Energy or Fatigue. Weight problems (can't lose it or gain it). Slow Healing.
Brain	Depression. Anxiety. Poor memory, focus, or concentration. Sleep disorders.
Immune system	Under-Reactive or Over-Reactive: Frequent infections (skin, sinus, bladder, bowel, yeast problems, etc.). Allergies. Auto-immune disease.
Musculoskeletal	Fatigue. Fibromyalgia (muscle or joint pains). Generalized aches/pains. Repetitive use injury and carpal tunnel syndrome. Weak connective tissues (ligaments, bones, etc). Headaches.
Sexual	Loss of Libido. Menstrual disorders. Infertility.
Vascular	Low blood pressure. High blood pressure. Raynaud's disease.
Bowels	Constipation. Gas or bloating. Digestive disorders, Irritable Bowel Syndrome (IBS)
Nervous system	Numbness of hands and/or feet (usually symmetrical). Dulling or loss of senses such as vision, taste or smell.
Skin	Dry. Acne. Pallor in light skin, darkening or dark patches in dark skin.
Hair	Hair loss, brittle, coarse, dry or oily.

Metabolic Energy Mechanism

All bodily processes require metabolic energy, which is stored in the form of ATP (adenosine triphosphate) molecules. The body converts fats, sugars, etc. into ATP. The thyroid gland, located at the base of the neck, makes the hormone T4 (thyroxine). T4 converts to T3 (triiodothyronine) and RT3 (reverse T3). The T3 turns on the ATP (energy) making machinery inside each living cell while the RT3 slows it down. Production of these thyroid hormones is controlled by TSH (Thyroid Stimulating Hormone), which is released by the pituitary gland in the brain. The pituitary takes its orders from the hypothalamus (also part of the brain). The adrenal glands, located on top of each kidney, help the body deal with stress. If the metabolic activity is excessive, the adrenals perceive this as a stress. In response to this stress, the hypothalamus will cause the pituitary to produce less TSH, thus producing decreased thyroid activity.

Some of the reasons for low metabolic energy are:

- The thyroid gland can not make enough T4 (hypothyroidism).
- The adrenal glands are too weak to handle the stress of the body's normal metabolic energy and force a down-regulation of energy production.
- The enzymes (cellular machinery) which make ATP may be held back due to chemical interference such as toxins, lack of needed ingredients (vitamins or minerals), or breakdown due to auto-immune disease or old viral damage.
- Hormonal imbalance such as growth hormone, testosterone, estrogen, or progesterone.
- Severe caloric restriction.

Each component of the body malfunctions in its own unique way when it doesn't have enough energy to function properly. Thus, if the brain has too little energy, thought processes such as memory and focus become impaired. For more examples see the symptoms list. A low body temperature typically accompanies low metabolic energy.

Diagnosing Metabolic Energy Problems

To restore energy to a healthy level, the causative problem(s) must be corrected. Toxic exposure, nutritional deficiencies, viral, and auto-immune damage are all, to some degree, universal. If severe enough, any one of these can overwhelm the body's metabolic mechanisms and become the leading cause of the problem.

However, these are not as common as the low metabolism caused by adrenal and/or thyroid dysfunction. The corrections described below relate to the most common causes we see, namely sub-optimal adrenal and/or thyroid function.

If **poor thyroid function** is the *only* cause, we typically see a reddish complexion, thinning of the outer eyebrows, easy weight gain, depression, sluggishness, excessive sleep, high blood pressure, and a decreased ability to fight infection. If **poor adrenal function** is the *only* cause, we typically see pallor, full eyebrows, difficulty gaining weight, anxiety, exaggerated startling, insomnia and unrefreshing sleep, low blood pressure, allergies and auto-immune problems. *Most people have a mixture of poor thyroid and poor adrenal function rather than purely one or the other, and therefore a mixture of symptoms.*

I have developed several tools that assist in diagnosing the causative problem and facilitate treatment, which I introduce here. They are very useful feedback tools for proper diagnosis and treatment of low metabolic energy.

- **Metabolic Diagnostic Scorecard™:** A method for looking at symptoms to provide guidance on whether there are adrenal, thyroid, or a mixture of problems.
- **Metabolic Temperature Graph™:** A method for measuring and interpreting daily temperatures to gain insight into metabolic energy issues associated with both adrenal and thyroid function.
- **Thyroid Scale Diagram™:** A method of evaluating thyroid lab data (TSH, Total T4, and Total T3) relating them to optimal values as well as each other. This provides a clearer picture of what is going on as opposed to the old, "your lab values are all normal", answer.

Metabolic Energy Repair

If *both* the thyroid and the adrenals are weak, adrenal repair must precede thyroid repair. If the adrenals are weak, then even normal thyroid activity places an excessive burden on them. One may begin to feel 'hypoadrenal' (coldness, weight loss, dryness, fatigue, insomnia, and/or anxiety) and then the body innately turns down the thyroid energy production. Conversely, if the adrenals are strong and the thyroid is weak or unable to keep up with the adrenals, one begins to feel 'hypothyroid' (heat intolerance, weight gain and fluid retention, tiredness, excessive need to sleep and/or depression). *A very common error is to focus entirely on the thyroid and ignore the adrenals.* In a *weakened adrenal state,* prescribing thyroid medication that contains T4 and/or T3 may produce limited or transient improvement. Subsequent increases of the dose offer little or no benefit as the medication pushes the energy machinery into overdrive. Unfortunately, this higher energy level is unsustainable due to the stress on the adrenals. Eventually the adrenals become fatigued and the symptoms of low energy return. If, however, the adrenals are functioning well, the thyroid hormones can do their job and the result is good metabolic energy.

Some general principles of treatment are:

- If the treatment is working, one should feel **improvement** as time goes on. Healing crises rarely occur with thyroid and adrenal repair. They tend to occur more often with detoxification or elimination of a biological agent.
- Successful treatment is achieved more easily through the use of **feedback** based on changing signs, symptoms, temperature patterns and lab values.
- When taking supplements, especially for those who are highly sensitive or have allergies, the old nursing adage of "**start low, go slow**" is very important to remember when restoring adrenal and thyroid function.

Restoring Adrenal Function

In general, things that cause stress hurt the adrenals. The opposite of these helps the adrenals. Avoid the stressors and seek out those things that help. Eat more proteins, especially amino acids. Limit carbohydrates, especially sugars. Avoid stimulants and physiologically stressful substances such as caffeine, diet pills, alcohol, cigarettes etc. If you have allergies, avoid the allergens. Common ones are wheat and dairy. We tend to crave foods to which we are allergic. Mold is a common serious stress but difficult to avoid. Reduce all stress. Even 'good stress', such as celebration, can sometimes be excessive for the adrenals. Look for opportunities to experience security, joy and optimism. Learn to avoid negative emotions such as fear (e.g. horror movies), anger etc. Increase rest. Get as much sleep as possible and make the timing as

regular as possible. Pushing too hard, excessive work or exercise, and any sleep deprivation stresses the adrenals.

Providing the body with proper support in the form of vitamin supplements is critical to repair. If one could choose only three items to start with, they would be:

- **B-Complex Vitamins**: A very complete B-complex with lots of vitamin B-5. Basic Cell Energy™ is designed specifically to support the adrenal healing process and also contains a variety of other needed nutrients to support this same process.
- **Vitamin C**: The buffered powder form of vitamin C is often most easily tolerated as part of a drink sipped throughout the day.
- **Amino Acids**: Individuals with weak adrenals often cannot digest meat or proteins into amino acids very well. The adrenals thrive on amino acids. As with the vitamin C, amino acids are best taken as part of a drink sipped throughout the day. Hydrolyzed collagen is a complete form of amino acid but it is made of a bovine source. Free-form amino acids are vegetarian safe but lack the essential amino acid tryptophan.

For a more comprehensive supplement treatment program, consider the following support items: adrenal glandular, slow-release pantothenic acid (vitamin B-5), and pregnenolone, digestive enzymes containing hydrochloric acid (HCl), DHEA or 7-Keto DHEA, essential fatty acids, magnesium, and MSM, and 5-HTP to help rest if not using SSRI medication.

Restoring Thyroid Function

For mildly poor thyroid function, one can often get the needed support with supplements such as tyrosine and iodine (e.g. kelp). Supplements containing mixtures of thyroid nutrients are available at health food stores. Some thyroid glandular may offer more complete support. If the thyroid condition is more severe, one may require prescription medication. Giving only T4 (e.g. Levothyroxine, Synthroid, Unithroid, Levoxyl etc) is a good choice if T4 is the only missing component. In individuals with poor conversion of T4 to T3, a desiccated thyroid preparation (e.g. Armour Thyroid) often works best because it contains the needed T3 as well. Breaking up the dose into two or three doses daily provides a more stable blood level of T3 and generally produces better results. Taking the daily dose all at once in the morning tends to be stressful on the adrenals and often leaves one feeling depleted by afternoon.

Metabolic Therapy™ Summary

Low metabolic energy can appear as any of numerous symptoms. The best way to eliminate the symptoms is to correct the underlying problem. Restoring metabolic energy enables the body's self repair mechanism to function well again and restore health. The most common cause of low metabolic energy is poor thyroid and adrenal function. It is the adrenal component that is least understood or appreciated. Both thyroid and adrenal function can be enhanced using supplement support and lifestyle changes.

How Low Metabolism Affects Our Health©

Detailed Version

Many health problems, such as **fibromyalgia** and **chronic fatigue syndrome,** stem from poor metabolism. There are many reasons why some of our body's systems might function poorly. One of the most common underlying reasons is low metabolic energy. What does this mean?

All of the body's functions rely on energy. The body utilizes a molecule called **ATP** (adenosine triphosphate) for energy to do its internal work. Sugar, fat, or protein is converted into ATP and then, the ATP is used to do work. ATP is for our body what gasoline is for our car. ATP can be used by every cell in the body (brain, skin, muscle etc.). It is the universal 'currency' of energy. When the body's ATP levels are less than optimal, the body is on an energy 'budget' and various physiological processes end up with sub-optimal function.

Thus, when the energy deficiency is in the *muscles*, they tire easily and develop spasms, cramps, or pain. Muscles require ATP for relaxation, which is why upon death, as the ATP is used up (and not re-manufactured), the muscles begin to contract and rigor mortis sets in. In the *brain,* it manifests as difficulty with thinking, poor memory, or depression. In the *immune system* it may manifest as allergies, frequent infections or even cancer. Other systems and organs such as skin, endocrine system, digestive system etc all exhibit energy deficiency in their own characteristic way (see the table on this page). Such a fundamental process affects many other processes in the body. It is easy to fall into a trap and begin to treat each component individually. Often the result is a visit to many specialists and a plethora of drugs and or supplements.

The 'on' switch for energy resides with thyroid hormone. The hand that controls the switch is the pituitary gland. It, however, responds to a variety of other signals and/or conditions. The way it all works (simplified version) is as follows.

HOW IT WORKS:

Thyroid Function: The thyroid has the job of turning on energy production in the body. There is a relationship between the thyroid gland, pituitary gland and body and it is called a feedback loop. That means what happens at one of these sites affects the others and they are all in balance with each other. The pituitary (via the hypothalamus) senses how much thyroid hormone is present in the circulation. If there isn't enough, it will secrete extra thyroid stimulating hormone (TSH) to tell the thyroid gland to make more hormone (T4). If there's too much thyroid hormone, the pituitary decreases its output of TSH. The TSH stimulates the thyroid gland to make T4 (a thyroid hormone with four Iodine atoms attached to it). The T4 circulates in the body (which acts like a reservoir for the T4).

When the body needs energy to be produced, it takes a T4 molecule and enzymatically removes one of the iodine atoms. It converts T4 into T3, which now can stimulate energy production in the cell by acting like a 'key' that fits into a receptor site. The hypothalamus/pituitary senses the level of T4 and T3, and secretes the appropriate amount of TSH (which regulates the amount of T4 production by the thyroid gland).

Reverse T3

Our energy system needs not only to turn energy on but also to turn it off. Throughout a normal day, there are times our system requires less or more energy. The short-term control is accomplished by a very clever mechanism in which T4 can be converted into T3 for stimulating energy production or into Reverse T3 (RT3), an energy inhibitor. This is accomplished by pulling off a different iodine atom from the T4. RT3 is like a 'dummy key' which resembles T3 enough to fit into the receptor site but *doesn't* turn the energy on. Meanwhile, as it occupies the receptor site, it *doesn't permit the T3 to enter* and turn energy on. Every day our system is balancing the T3 and RT3 levels to maintain appropriate metabolic (energy) levels. Like driving a car, we use the accelerator (T3) and adjust by using the brakes (RT3) as needed.

If a sudden need for lowering energy levels arises, we make more RT3 out of the T4. If the need for reduced

energy persists for months or years, we simply begin to make less T4 (by reducing TSH). This leads to a situation where the TSH level is low normal (to reduce the T4 production). This produces low normal levels of T4 and therefore low normal levels of T3. Thus there is less wasted effort in manufacturing thyroid hormone that will not be used. We do the same with our cars. If we find that we really need much less work out of our car, we eventually get a smaller car (smaller engine) that wastes less gas during idling but unfortunately then gives weaker performance when we occasionally need heavier work.

Adrenal Function

The adrenal glands' function is complex. The adrenal glands (located above the kidneys) have many functions, one of which is the job of helping the body deal with stress and maintain stability. Stress can be emotional (e.g. family dysfunction), physical (e.g. an injury), biological (e.g. a chronic viral infection), nutritional (e.g. a deficiency), chemical (e.g. exposure) or metabolic as occurs in excessive metabolic stimulation of hyperthyroidism such as Graves's disease or in the *early* phase of Hashimoto's (autoimmune) thyroiditis. We can have a 'bad' stress as just described, or a 'good' stress such as having fun on a roller coaster.

The adrenals produce many hormones among which are sex hormones, DHEA, pregnenolone, and cortisol (same as cortisone). The adrenals deal with stress, change and stability. They help us survive a dangerous situation. They seem to modulate and support immune function. We can see an example of the adrenal hormones' immune modulation if when one has an allergic reaction, one goes to the E.R. and the doctor will probably give adrenalin (named after the 'adrenal' gland) for a severe, immediate, life-threatening reaction or 'cortisone' (named after the adrenal 'cortex' where it is made) to suppress an over-reactive immune system. If we manufacture too little cortisol, we tend to develop allergies (over-reaction). Long-term cortisone excess leads to immune suppression. DHEA and pregnenolone generally help us to feel stronger and support a good immune function.

Adrenal Burnout

The adrenal glands are designed to help us in short term stress. If we live in stress for too long a period of time, the adrenal glands are unable to keep up the pace and begin to function as if they are fatigued. As they fatigue, they go through different phases of fatigue. Initially there is an excessive production of cortisol and DHEA. In later stages, there is a decrease in production of cortisol, DHEA, testosterone (in males and females), and hormones that regulate mineral metabolism (this can cause an inability to 'hang on to water' with excessive urination and thirst). The signs and symptoms are listed in the accompanying table.

Wilson's Syndrome

In 1990, Dr. Denis Wilson described a condition he calls Wilson's syndrome. It is a condition in which the standard thyroid lab tests are normal but the patient 'functions' as if they were hypothyroid. The old term for this is euthyroid sick syndrome. The difference here is that Dr. Wilson described the syndrome in greater detail than before, described its cause and its treatment (using slow release T3). In short, Dr. Wilson describes a condition in which the body steps on the metabolic brakes and gets used to staying there, *indefinitely.* Thus, there is a persistent RT3 elevation (measurable on lab tests). More information on his work can be obtained on the Internet at www.wilsonssyndrome.com . This condition often appears after the body has undergone stress such as surgery, delivery, food deprivation or yo-yo dieting (remember, we were designed to live 10,000 years ago in an environment that doesn't have a restaurant at every corner. Yo-yo dieting sends our system the message that the food supply is *unreliable.* Therefore, better stock up and 'save for a rainy day').

After working with several hundred patients, I came to recognize something new. Wilson's Syndrome has two presentations. The first was very well described by Dr. Wilson and relates to a condition where the body produces less energy because it is trying to *limit energy utilization* (i.e., conserve fuel). The body acts as if it's in a famine state. The second is still waiting for an official name and relates to a decreased energy production because the body is trying to *limit the amount of energy being poured into a system that can't manage so much energy.* The typical case is adrenal fatigue where the adrenal glands can't handle the

amount of metabolic activity and changes that occur in a high-energy state. At this point, for the sake of brevity and clarity, we can call Wilson's Syndrome (which is a Wilson's type **L**owered **E**nergy **S**tate due to **Thyroid**) as **LES-Thyroid**. We can call a lowered energy state due to adrenal fatigue **LES-Adrenal**.

There are also non-adrenal causes. Examples of this are seen in women with low progesterone levels, men with low testosterone levels, individuals with a nutritional deficiency, individuals whose energy producing machinery is damaged, e.g., after exposure to toxic metals or chemicals or those with mitochondrial damage after a severe viral illness.

In an example of how a nutritional deficiency can cause this is illustrated in the following example. Mrs. Smith has a magnesium deficiency. Thousands of enzymes are used to drive many of the body's chemical processes including energy production. Let's look at a sequence of three enzymes doing their job. Enzyme A produces a substance ('a') that will be later used by enzyme B. Enzyme B produces a substance ('b'), used by enzyme C to produce substance 'c'. Enzyme B needs magnesium to function properly. It only has half as much as it needs to work properly. Only half of the B's are doing their job. In a high metabolic state, A is producing lots of 'a's. These 'a's are accumulating because many of them are not being taken up by B. There is an accumulation of 'a'. Enzyme C is all revved up and trying to crank out 'c's but is not being fed enough 'b's. In this scenario, there are too many 'a's and figuratively speaking a 'vacuum' at C with too few 'b's to feed this pathway. This produces an unbalanced body chemistry state. One way to correct this is for the body to slow down metabolism to accommodate the rate of the slowest member.

Poisoning such as that which occurs with mercury or lead can mimic this condition because the mercury can displace the magnesium from its place in enzyme B, thus making that enzyme non-functional and creating the above described situation.

The mechanism for slowing metabolism down is the same for both Type Type II cases and I. Over a short term, this is done by elevation of RT3. If the problem persists for a long time, such as a few years, the mechanism shifts toward a decrease of TSH. In such cases, the thyroid function tests show a low or low normal T4 and a low normal TSH (described above).

Both LES-Thyroid and LES-Adrenal produce a low body temperature and low metabolic state. Some of the signs and symptoms such as slow healing, a weakened system and low physical or mental energy may be shared by both. Other symptoms are quite the opposite of each other. LES-Thyroid individuals tend to have good facial color, tend to gain weight too easily and generally maintain a good sense of humor.

LES-Adrenal individuals tend to have more facial pallor either can't gain weight or can gain it but are able to avoid obesity. They tend to take life more seriously and tend to have more concern over their condition. Unfortunately, Murphy's Law states that you don't have to have only one problem at a time. We often see the two conditions co-existing. This causes a mixed and sometimes confusing picture.

LES-Thyroid is corrected by careful use of *slow release T3* that can be obtained by prescription from a compounding pharmacy. When properly used, this thyroid hormone helps reduce the body's RT3 levels. Once the RT3 levels are down to normal and the body temperature has risen to an average of 98.6, the slow release T3 is no longer necessary and from that point on the body can maintain a normal T3-T4-TSH-RT3 balance and a normal metabolism.

LES-Adrenal poses a more interesting challenge. Symptoms are described in the table on this website. LES-Adrenal is corrected by fixing whatever is slowing down the system. Adequate rest and stress reduction are essential. A practical evaluation of adrenal function can easily be obtained by clinical evaluation (facial color, pupillary response to light, and daily temperature patterns) and saliva test called the Adrenal Stress Index (ASI) by Diagnos-Tech Labs. Along with this article is a comparison chart of LES-Thyroid (Wilson's Syndrome) vs. LES-Adrenals.

Adrenal/Thyroid Symptom Chart©

Comparison of low energy states caused by adrenal fatigue vs. thyroid system dysfunction

Key: generally absent - Possibly present + Often present ++ always or almost always present +++

Sign or symptom	↓Adrenal	Mixed	↓Thyroid
Main function of the gland	Manage stress, maintain stability		Turn on energy production
Low function induced by stress[1]	+++ (LES-Adrenal)	+++	+++ (LES-Thyroid)
Body type	Thin, can't gain weight	Gains easily, can lose it	Can't lose the weight
Face shape	Eyes, cheeks sunken when severe	Normal to full	Full, puffy around eyes
Eye brows	Tend to be full	Normal to sparse	Sparse outer thirds
Facial coloring	Tendency to pallor, especially around mouth[2]	Pallor around mouth (more visible with light skin)	Ruddy complexion
Skin coloring	Light skin→fragile adrenals Dark skin→stronger adrenals		No significant difference
Nails	Thin, brittle	Break easily	Break easily
Pigment distribution	In late phase, may tan too easily. Vitiligo (spots or patches of de-pigmentation) may be present		
Light sensitivity or night blindness, difficulty driving at night	+ +	+	-
Hypersensitive hearing (hyperacusis)	+	+ / -	-
Tinnitus (ringing in the ears)	++	+	-
After image (e.g., seeing the image of a flash bulb or bright light moving by longer than others)	+ +	+	-/+
Sex distribution F:M	Approximately 8:1	Approximately 8:1	Approximately 8:1
Typical pains	Headaches, migraines, muscles, carpal tunnel	muscles, carpal tunnel	Occasionally joints, muscles, feet/lower legs
Temperature pattern[3]	Thermal chameleon (hot in hot weather and cold when it's cold). Tends to low body temperature around 97.8 or lower. Fluctuating[3] pattern.	Fluctuating pattern, usually averaging 97.8 but can be lower.	Stable non-fluctuating pattern, average can be from 98.4 (mild) to 95.0 (severe).

Sign or symptom	↓Adrenal	Mixed	↓Thyroid
Cold intolerance	+ + +	+ +	-
Cold hands / feet	+ +	+	-
Heat intolerance	+	+	+++
Tolerance to change or stress	Poor	Poor/Moderate	Moderate
Hair quality	Thin and wispy. Dry.	Tendency to become sparse	Tends to be coarse, may become wavy or curly (rare) or change color
Skin	Dry. Thin. Finger-prints often 'smoothed out' or flat/shiny and may have longitudinal wrinkles over finger pads (probable cause: low collagen level)	May be thin, dry, bruise easily, poor healing.	Poor healing. May bruise easily.
Connective tissue quality (Typically seen in ligaments, tendons, skin, hair, and nails)	Poor. More easily injured than 'healthy' friends. Joint strains / sprains common. Flat feet common	Poor. More easily injured than 'healthy' friends.	Poor but may be coarse so it may appear thicker but its weak w/ poor repair
Poor healing, easy bruising	+ +	+ +	+ +
Tendency to osteoporosis	+ +	+ +	+ +
Sweating	May be excessive in early phase. Poor sweating in late phase.		Not very affected
Body water	Tendency to dryness. Can't hold on to water	Can be mixed	Tendency to fluid retention
Immune system: Allergies	+ + +	+ +	+
Immune system: Autoimmune	+ / + +	+ + 4	4
Immune system: Infections (e.g., sinusitis, bladder, bowel, skin etc.)	+	+ + +	+ +
History of infection with EBV (Mononucleosis or 'mono')	+ + Adrenal often weaken w/ EBV	+	+ / -
Sensitivity to medications, supplements, alcohol etc. Needs very small doses	+ +	+	-
5- Intuitive	+ +	+	+ / -

Sign or symptom	↓Adrenal	Mixed	↓Thyroid
Personality tendency: Humor	- / +	+	+ +
Personality tendency: Serious	+ + /+ + +	+ +	- / +
Depression	+ +	+ +	+ +
Anxiety, panic attacks, worry, fear, insecurity, feelings of impending doom (any combination). "I thought I was dying..."	+ + +	+ +	+
Mental abilities	Can have difficulty with focus, concentration, short term memory		
Startle easily	+ + if severe adrenal fatigue	+	-
Sleep pattern	Insomnia tendency. Sleep tends not to be refreshing.	Mixed	Tend to oversleep. Occasionally, narcolepsy (an uncontrollable need to sleep)
Dietary habits	Often lean toward being vegetarian or avoids some foods	Tends to have fewer dietary restrictions than the pure adrenal type	Tends to eat everything
Digestion	Often has difficulty digesting meat. 6	Poor but they often think it's good.	Poor but they often think it's good. Tendency to **constipation**
Malabsorption of nutrients	+ + +	+ +	+ +
Cravings	Sweets, carbohydrates, salt (any combination), black licorice	Mixed	Fats
Blood sugar 7	Tendency to hypoglycemia. May need many small meals or 'crash'	Can range from mild hypoglycemia to hyperglycemia	Normal to hyperglycemia
Exercise tolerance	Causes fatigue. Can't persevere. If severe, body temp. *drops* after exercise	Mixed	Can't exercise much. Tires easily.
Standing still is difficult. Walking is easier.	+ +	+	–
Fibromyalgia / chronic fatigue	+ +	+ +	+ +
Problems with menses and/or fertility (females)	+ +	+ +	+ +

Sign or symptom	↓Adrenal	Mixed	↓Thyroid
Pins and needles sensation in **hands**, may also be in feet if severe. Can present as numbness	+ If adrenal problem is severe. Tends to be symmetrical.	+ / -	-
Blood pressure	Tends to run low, e.g., 80/50 (low end) to 110/70 (high end)	Can be low, normal or high	Ranges from normal to very high
Orthostatic hypotension (light-headed when getting up to stand from laying or sometimes, even sitting)	+ +	+ / -	-
Heart: Palpitations ("feels like my heart was about to jump out of my chest"). Often occurs at rest or in bed.	+ +	+ / -	-
Raynaud's Syndrome/Disease	++	+	-

TYPICAL FINDINGS ON BLOOD TESTS			
Sign or symptom	Adrenal	Mixed	Thyroid
Chem: Total cholesterol	Usually low to low normal (e.g., under 160)	Mixed (can be low, mid-range, or high)	Usually high. Very hard to reduce.
Chem: HDL (the good cholesterol)	Usually normal to high	Mixed	Usually normal to low
Chem: Cholesterol/HDL ratio 9	Usually 3.0 or less	Mixed	Usually3.5 or more
Chem: Serum potassium	tends to be 4.0 or higher		
Chem: Serum sodium	tends to be 140 or lower		
Chem: DHEAS	low to low normal		
Chem: Testosterone F:M	F: tends to be low M: normal to low		
CBC: WBC 10	Tend to low normal	Normal to low normal	
CBC: Platelets 10	Tend to low normal	Normal to low normal	
CBC: MCV (mean corpuscular volume) 11	Tends to be high or high normal. Taking B12 regularly may normalize it.		
CBC: RDW (red cell distribu-tion of width) 12	Normal to high normal		

TYPICAL FINDINGS ON PHYSICAL EXAMINATION			
Missing outer third of eyebrows	-	-/+	+ +
Full eyebrows, especially outer	+ +	-/+	-
Pupillary light response [13]	Usually under 3 secs.	Usually under 5 secs.	Usually over 5 secs.
Tissue around the eyes	Sunken appearance	normal or some 'bags' under the eyes	puffy around the eyes, often bags under the eyes
Typical weight distribution	Uniformly thin	Gravitates to lower body (tummy/hips)	Uniformly heavy or more at lower body
Pale, especially around the mouth [2] (Caucasians), darker skin in dark skinned individuals	+ + +	+ + +	-
Ruddy complexion (light skinned individuals)	-	Mixed: Face can be ruddy while pale around mouth	+ +
Edema (non-pitting) at lower legs	-	-/+	+
Reflexes (ankle) [14]	Brisk	Often seem normal	Slow [14]
Heart: Mitral valve problems [8]	+ / + +	+	-
Hair: Thin/sparse on arms and/or absent on lower half of lower legs	+ +	+	-

TYPICAL VALUES OF THYROID FUNCTION TESTS -15					
Condition	**Temp** -19	**TSH**-18	**Total T4**	**Total T3**	**Reverse T3**
Hypothyroid (primary)[20]	low	high	low-normal	low but high relative to T4 [16]	low [17]
Hypothyroidism (secondary/pituitary)	low	Low to 'low nl.'	Low to 'low nl'	'Low nl.' but 'high relative to T4' [16]	low [17]
Hypothyroidism (secondary/LES-Adrenal)	low	'low normal'	low to 'low normal'	low to 'low normal'	low
Euthyroid sick syndrome / Wilson's syndrome	low	normal	normal	normal	high
Grave's disease (hyperthyroid)[22]	high or nl	low	high	high	high
Hashimoto's thyroiditis[4]: early phase or hyperthyroid phase	High or nl	low	high	high	high
Hashimoto's thyroiditis[4]: late phase, hypothyroidism-untreated	low	high	Low or 'low nl.'	Low or 'low nl.'	low
Hashimoto's thyroiditis[4]: late phase, hypothyroidism-treated with T4 *too rapidly*[23] after hypothyroidism was discovered (Wilson's syndrome)	low	normal	normal	normal but tends to be low normal relative to the T4	high
Toxic interference to metabolism	low	'high-normal'	'high-normal'	'high-normal'	low
The above chart is based on a combination of literature-based knowledge and Dr. Rind's experience with treating over 3,000 patients with thyroid and/or adrenal problems. It is for informational purposes only and should not be used for medical self-diagnosis. Any diagnosis or treatment should be done in consultation with a physician					

1) **Stress can be any of these:**
   - Emotional (hardships, history of abuse etc.)
   - Insufficient sleep
   - Physical (chronic pain or over-training especially female athletes) or physiologic stress (e.g., surgery)
   - Chemical: Exposure
   - Metabolic: Excessive metabolic stimulation such as hyperthyroidism. This often occurs in the early phase of Hashimoto's (autoimmune) thyroiditis or Graves disease.
   - Chronic infection such as viral (e.g., Epstein Barr virus)
   - Physical trauma such as injury, surgery, delivery

- Dieting excessively

2) **Facial pallor:** A pale color, especially around the mouth. Easiest to see in light skinned individuals. In olive skinned individuals it is much harder to see. In dark skinned individuals (Africa, India etc) there is a hyperpigmented (dark) area around the mouth and sometimes on the forehead, cheeks or other areas on the body. Since wrinkles stay in the 'pale' area, puckering the lips artificially creates wrinkles for the moment and their location often identifies the same region in darker skinned individuals. It is also easier to see in women than men (because of the beard hair which interfere with color identification and thicken the skin to make it more resistant to wrinkles). See sample on my website www.drrind.com

3) See temperature graph instructions and sample at back of this article.

4) **Hashimoto's thyroiditis** is common and is an autoimmune condition in which the individual develops an allergy to their own thyroid gland. In the early phase when there is destruction of thyroid gland and spillage of thyroid hormone (T4), there is a hyperthyroid effect. The hypermetabolic state that occurs usually stresses the adrenal glands and causes adrenal fatigue. When enough destruction has occurred and there is little T4 generation, one goes into a hypothyroid phase. Now one has hypothyroidism *and* adrenal fatigue. Autoimmune antibodies are almost always present on blood testing. Lab diagnosis: elevation of TPO (thyroid peroxidase) and/or thyroglobulin antibody.

5) **Intuition** is an interesting quality of early life adrenal fatigue. The later in life the development of adrenal fatigue, the less likely one is to spontaneously develop intuitive ability. People that develop adrenal fatigue early in life are often described as empaths and will tell their friends (but not their doctor) about their ability to pick up other people's feelings. They often suffer because of their high sensitivity and are always looking for new ways to 'ground' themselves. This problem often clears by simply supporting the adrenals and getting them to function well again. Poor adrenal function is not essential for intuitive development. Strengthening the adrenals does not weaken the intuition once it is there.

   Individuals that develop adrenal fatigue *later* in life (because of high stress, chemical or mechanical injury or virus such as EBV(Mononucleosis) etc.) tend not to claim this intuitive ability.

   Spiritual orientation is more common in those with early adrenal fatigue. Less common in those with later onset adrenal fatigue and those with strong, healthy adrenals. There seems to be a personality difference (archetype) between those with strong adrenals and those with weak adrenals: Strong adrenal types tend to be mesomorphic (stocky, solid/heavy bone build),good facial color, less sensitive to drugs, supplements, feelings, foods etc., they tend to be more physically oriented. Type O blood tends to have more resilient adrenals (but can still end up with a problem—they tend to recover adrenal function well). Weak adrenal types tend to be thin, pale, more delicate, and more sensitive to drugs, supplements, feelings, emotions, and foods/chemicals. Often type A blood. Often state that they pick up other people's feelings and therefore don't like malls, parties and crowds. Those who have had the adrenal weakness since an early age tend to be intuitive and are often interested in the non-physical or spiritual aspects of life. Often interested in astrology, Tarot cards and esoterics.

6) These individuals tend to digest meat poorly because of low gastric acidity. They often think they have high acidity because of occasional heartburn or heartburn with digestive enzymes containing digestive acid. The problem is usually one on inadequate acid production but *less adequate* gastric protection. This could be helped by chewing or sucking on a specific type of licorice candy called **DGL** found in health food or vitamin store. Suck or chew on it about ½ hr before the meal. It produces increased secretion of gastric (stomach) mucous protective layer. This helps to prevent irritation by the acids in the stomach.

7) **Hypoglycemia** = low blood sugar. **Hyperglycemia** = elevated blood sugar

8) **Mitral valve problems** (prolapse/murmur) seem to affect individuals with adrenal fatigue more often

than others. Typically one would see it in a female, often thin build, body proportions tend to be smaller at the top, heavier at the bottom where weight gain, if any, tends to take place. The tendency to valve problems may be related to connective tissue quality since it sometimes improves with connective tissue support. Hawthorn berry seems to help. Individuals with plain hypothyroidism don't appear to have a higher incidence of valvular problems compared to the rest of the population.

9) In adrenal fatigue, the total **cholesterol** tends to run low to low normal while the HDL tends to run high normal to high. In hypothyroidism (or in Wilson's syndrome or LES-Thyroid where there may be 'normal' lab tests for the thyroid but actually the body functions as if hypothyroid), the opposite tends to occur with a nigh normal to high cholesterol and normal to low HDL. Often one might see a total cholesterol value at around 160 or less.

10) In low metabolic energy states, it is common to see WBC (White Blood Cells are the front line soldiers against infection) and Platelets (they work to initiate a clotting response in areas of vascular injury) at the low end of 'normal'. Typically, the WBC is under 6 and the platelets are under 200.

11) The MCV (mean corpuscular volume) is a measure of the size of the red blood cells. Their size tends to increase as vitamin B12 deficiency increases. Individuals with low gastric acid, poor digestion / absorption tend to run low on vitamin B12, so they tend to have larger blood cells, i.e., MCV tends to be at high end of normal or high. This is more common in adrenal fatigue since these individuals tend to eat less meat, tend to digest it poorly if they do eat it and generally absorb poorly. Most labs give the upper limit as 98 to 100. I find that with 94 or higher there is benefit from B12 supplementation. There are many good sublingual supplements available. Methylcobalamin 5,000 mcg by Jarrow (most health food stores have it) is a good one to take.

12) RDW (Red cell Distribution of Width) measures the distribution or variability of the size of red blood cells. Individuals with stable health tend to have little variability in cell size. An unstable or poor state of health generally shows up as higher variability in cell size. For example, athletes may range at 11.5-12.5. Someone with generally poor health may be at 13.5-14.5. Cancer patients often have values of 17+ (but having such a number does not necessarily mean there is cancer).

13) I've learned that poor adrenal function corresponds to **poor ability to maintain constricted (small) pupils when a light is shined into the eye** (not directly into the eye but at a slight angle so it is not too annoying). Iridologists have known this for a long time. The same type of problem these individuals have that interferes with their ability to maintain constriction of blood vessels when getting up (thus allowing blood to pool downward and cause dizziness as an initial response) is what happens when light is shined into the eye. The pupil needs to constrict to protect the inner eye from too much light. It can't maintain it but keeps trying (inability to persevere is one of the hallmarks of adrenal exhaustion). This produces a vacillation in which the pupil alternates between contracting and dilating. If the constriction is maintained for 8 or more seconds, it is usually a sign of a healthy adrenal system. Brown eyes tend to be more stable in bright light and the movement is more difficult to distinguish than in blue eyes. I grade the duration on a scale of 10. Thus if the pupil is stable for 3 seconds and then starts dilating/constricting, I give it a score of 3/10. This helps track progress as the adrenal glands are being treated.

14) When thyroid function is low (frank hypothyroidism or Wilson's Syndrome or LES-Thyroid), **the reflexes slow down.** This is most easily seen in the Achilles tendon (ankle) reflex where after the downward motion, the return of the ankle to the up position is slow. Approximately ½ to 1 second is OK. If it's slower, it may give the impression that there is 'no reflex' while the reason is that the reflex hammer may be too fast for the Achilles tendon. The way to test it then would be to for the health practitioner to flip the foot upwards (dorsally) in a rapid jerking motion, then relax the hand while gently exerting a subtle upward (dorsal) pressure. In a very slow reflex, the foot slowly moves downward then slowly upward. The cycle can last several seconds. I've seen it as slow as 12 seconds in severe cases. This allows for easy monitoring of thyroid replacement therapy and its effectiveness. My website (DrRind.com) will soon have a video demonstration of the technique.

15) It is helpful to compare lab values relative to their position on the scale of 'normal'. Usually there is an **optimal** point at which function is near the ideal for the average individual. The 'ideal' may be found by looking at the average value for very healthy individuals. Often, it is near the mathematical midpoint of the total range of acceptable values. This tends to be the case for Total T4 and Total T3. For example, most labs list the acceptable or 'normal' range for T4 as 5 to 12. The mathematical midpoint is 8.25 and this is the value I most often see in healthy individuals plus or minus 0.5. For T3 it is usually between 60 and 180, the mathematical mid-point is 120. I also find this to be true for healthy individuals (usually they are around 115-130). The TSH is different. Normal range is around 0.5 to 5.5. The midpoint here is 3.0 but I find that 'healthy' individuals tend to have values of around 1.5-2.0. This can vary among individuals and these numbers are not carved in stone. They do, however, give an idea of approximate preferred values. When looking at 'normal' values, remember, normal does not mean optimal. It may be normal to have a $5,000 debt on one's credit card. It is not, however, 'optimal'. Most doctors would agree that the following 'normal' values spell trouble for the patient:

TSH= 0.6, T3= 175, T4= 11.5

The above values are those of an individual who is producing high normal levels of thyroid hormone yet the pituitary gland is producing very little thyroid stimulating hormone (TSH). This person's thyroid is overly active and s/he may be heading toward hyperthyroidism. They need to be watched for possible autoimmune thyroiditis developing.

TSH= 5.4, T3= 75, T4= 6.0

The above values are those of an individual whose thyroid gland is barely producing enough thyroid hormone to stay within normal limits in spite of strong stimulation by the pituitary (high 'normal' TSH) to produce thyroid hormone. These individuals tend to feel better with a little T4 support.

Although both examples are 'normal', the patients came to the doctor with opposite complaints. The first probably can't gain weight, is having anxiety, nervous, can't sleep well, reflexes are brisk, body temperature is running at around 98.6 or maybe a little higher. S/he has symptoms suggestive of hyperthyroidism. The second is probably having trouble losing weight, feels sluggish, poor concentration and memory, needs to sleep more or more often, has constipation, low body temperature (usually below 98.0). The signs and symptoms are suggestive of hypothyroidism. Both are technically 'normal' yet they obviously are not in the same medical condition regarding their thyroid gland.

In LES-Adrenal, typically we find TSH at 1.6 or less while the T4 and T3 values are below mid-normal (or 'optimal') levels. That's like the pituitary saying, I know there's little thyroid/metabolic stimulation and I'm deliberately keeping it that way. The analogy is a driver driving 40MPH in a 55 MPH zone (*let's think of this as low normal thyroid values*). You ask him, "Why are you driving so slowly? I notice you're barely stepping on the accelerator"(*i.e., the TSH is low normal*). Driver: "My car is not able to handle more 'energy'. When I give it more gas, it shakes and rattles...feels like it can't handle it" (*i.e., the adrenals can't handle so much metabolic energy*). "I can't drive any faster without having a problem" (*That's why the TSH, T4, T3 are all low normal*).

16) If the T4 is mid-normal (e.g., around 8.5), we would expect the T3 to also be around mid-normal (e.g., around 120). If the T4 is 8.5 and the T3 is 90, we might suspect that there is poor conversion of T4 to T3 such as in Wilson's syndrome or LES-Thyroid. The rest of the T4 is probably being converted to RT3. If the T4 is 8.5 and the T3 is 140, we might say that there is high conversion of T4 to T3. The body is trying to get more energy out of the available T4 (The T4 is converting mostly to T3 and not too much into RT3, thus the RT3 is probably very low). This can be found typically in states where there is an impediment in the energy manufacturing mechanism (Krebs cycle), for example, heavy metal toxicity or magnesium deficiency. The pituitary is 'snapping the whip' at the mitochondria by throwing more T3 at them in an effort to get them to produce ATP. They are producing too little ATP because the mechanism is either jammed by a heavy metal or the enzymes are low on an essential mineral such as magnesium. It is important to look at the relative values when trying to figure out what is the root cause behind the

problem.

17) RT3 values need to be looked at in a relative sense. Almost all patients present values that are 'within the normal values'. Nonetheless, any value above the lowest end of the 'normal' range provided by the lab is usually associated with symptoms of hypothyroidism (unless it is a response to high or high normal T4). In hyperthyroidism, we need a higher than usual RT3 to protect from the excessive stimulation of the high T3. The same high value in an individual withT4 of 8.5 would produce symptoms suggestive of hypothyroidism (Wilson's syndrome or LES-Thyroid). If the body were a car, we would say that the car has an accelerator (T3) and a brake (RT3). Just as we always drive alternating acceleration-braking-accel-brake-accel etc., so does the body manage itself hormonally, driving the accel-brake-accel-brake etc. It uses T3 and RT3 for this purpose. The T4 in this case, is like the foot hovering above the pedals. Just like the 'foot' is neither an accelerator nor a brake (until you decide which it will be), so is the T4 neither a stimulant nor is it an inhibitor until the brain decides how to convert it.

    If we go back 10,000 years, the amount of metabolic energy we needed to chase or run from an animal is different from what we needed to take a nap. The body adjusts its energy levels accordingly. In our daily lives, we can see how troublesome it can get when the mechanism doesn't work properly when we have too much energy to sleep (e.g., insomnia) or too little energy to stay awake (e.g., narcolepsy, oversleeping and fatigue).

18) The TSH reflects how the brain/hypothalamus/pituitary (lets say 'pituitary' for short) feels about the current need and supply of energy. We might say it is the expression of desire for T4 and T3 by the pituitary. Thus, an optimal range TSH such as 1.5-2.0 is like the pituitary telling us it is content with the level of thyroid hormone available relative to the metabolic need of the body. If the TSH is low (relative to 'optimal'), the pituitary is saying that it wants little or less T4 (and/or T3). Conversely, a high TSH (relative to 'optimal') is the pituitary saying it would like to see more or a lot of thyroid hormone relative to available supply. Thus we can think of the TSH as reflecting the 'desire' of the pituitary for thyroid hormone after it has checked out the metabolic needs of the body in relation to the amount of available thyroid hormone.

19) **Temperature:** It is important to compare temperatures with the thyroid hormone levels. For example, someone who is feeling sluggish, gaining weight etc. and has an average daily temperature of 96.4 and T3, T4, and TSH in the mid normal range is having a problem (either Wilson's syndrome, or LES-Thyroid or a problem with toxic load). As you can see from the table, it is one more piece of information that helps us solve the puzzle. The pattern of the temperature is very important. IF the average temperature is below 98.6, metabolic activity is sub-optimal. If the stability of the temperature is poor (vacillates from high to low to high to low etc.) then the adrenal function is poor. The adrenal glands help the body maintain stability. When they are too exhausted to function well, the temperatures oscillate. When adrenal function is strong, the temperatures are stable and vary little from day to day. It is important to remember that the average temperature in a population may be 98.0. That does not mean its 'OK'. The average temperature in a *healthy* population (e.g., a group of athletes in peak condition, living in the Alps on organic food, sleeping adequately, no stresses etc) is 98.6.

20) In a given population, the normal age of death may be 76 yrs. old but that is not optimal. If you live there and you're 75 yrs old, you don't want to be *normal*, you want to be in *optimal* medical condition.

21) Primary hypothyroidism is when the thyroid gland is either incapable of making T4 or has been removed and therefore the body can't manufacture T4. In such cases, it needs to be replaced with T4 from an outside source, usually in tablet form.

22) In Grave's disease we often see a high conversion of T4 to T3 *in spite* of elevated T4, low TSH and a body that is clearly suffering from excessive thyroid stimulation. The protective mechanism of balancing out the T3 with RT3 seems to be poorly functioning in many cases. Lab diagnosis: elevation of TSI (thyroid stimulating hormone immunoglobulin). Bugleweed (an herb) is sometimes helpful with Grave's.

23) An example of treating too rapidly is this: The doctor discovers the hypothyroidism. Correctly guesses that the patient will need 150mcg of T4. Prescribes 150mcg T4 (Synthroid, Levothroid, Unithroid etc.) as the daily dose. Patient feels wonderful initially but eventually feels hypothyroid again. TSH is excellent at 1.5 – 1.8. Raising the dose doesn't correct the problem. What happened? Ans.- the sudden high level of T4 caused the body to go into 'protect' mode and generate higher levels of RT3. This cancels out much of the T3 effect the patient originally felt when s/he was hypothyroid and in high T4 to T3 conversion mode. How to avoid this problem? I've found that increasing gradually (e.g., starting T4 dose at 25mcg daily for 3-4 days, increasing by 25mcg every 3-4 days until reaching the target dose) often prevents much of this rebound or protective response. Most patients with history of Grave's or Hashimoto's will require adrenal treatment (see FAQ's section on www.DrRind.com) to regain a 'healthy' (vs. 'normal) metabolic state.

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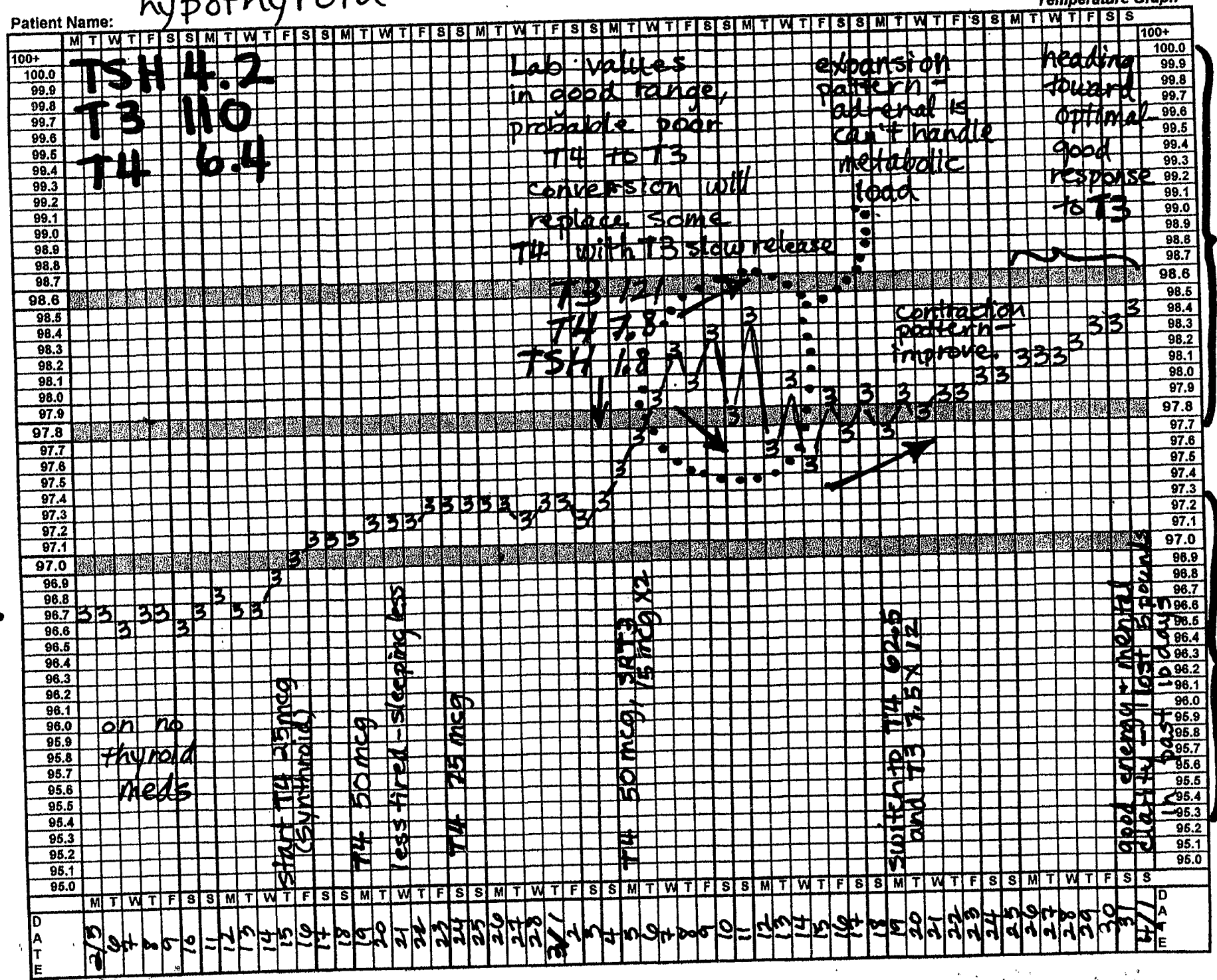
Sample Graph

George hypothyroid

Center for Holistic Medicine
Bruce Rind, MD

Patient Name:

Temperature Graph



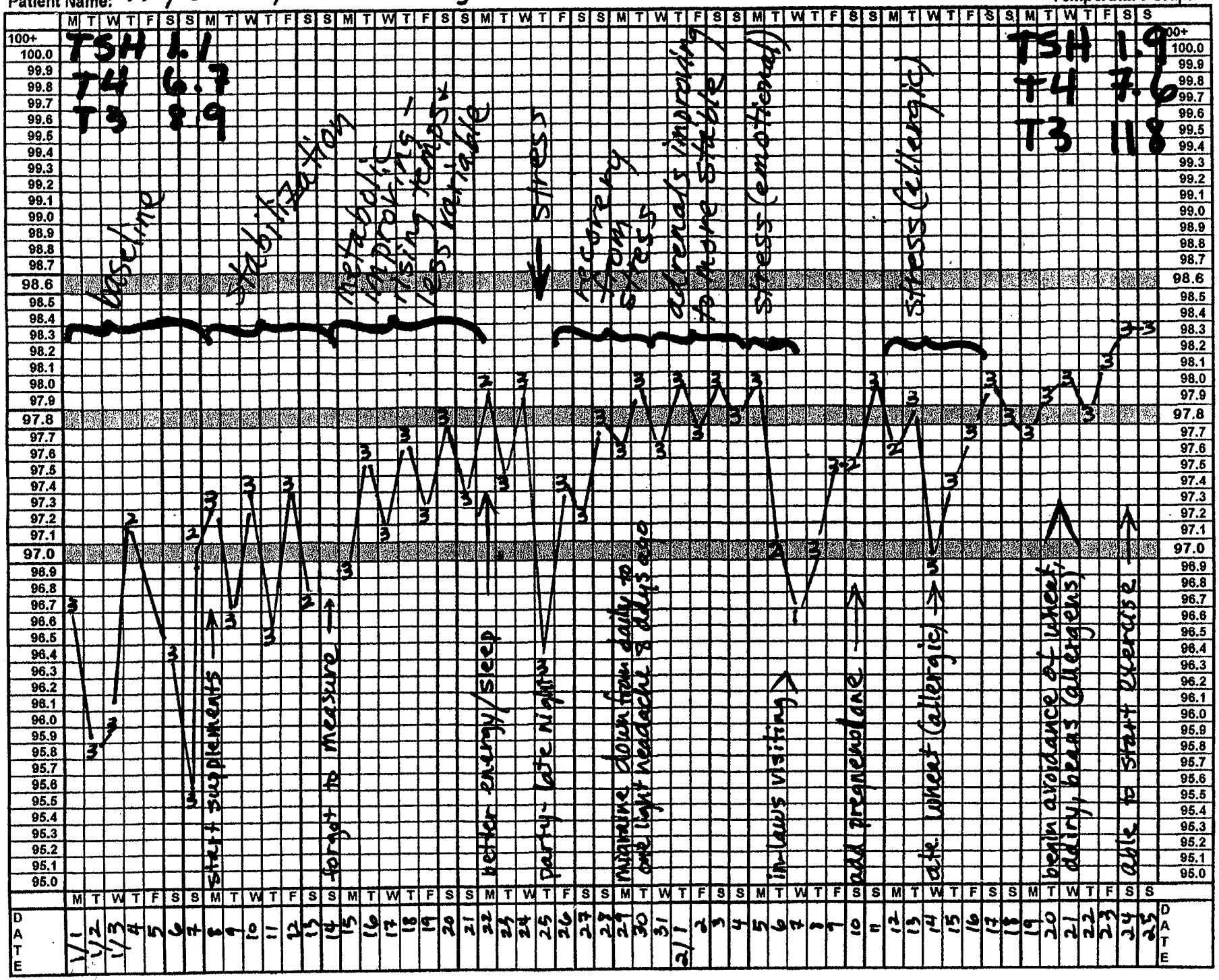
Sample Graph

Center for Holistic Medicine

Bruce Rind, MD

Patient Name: 47 yrs. old, adrenal fatigue

Temperature Graph



Sample Graph

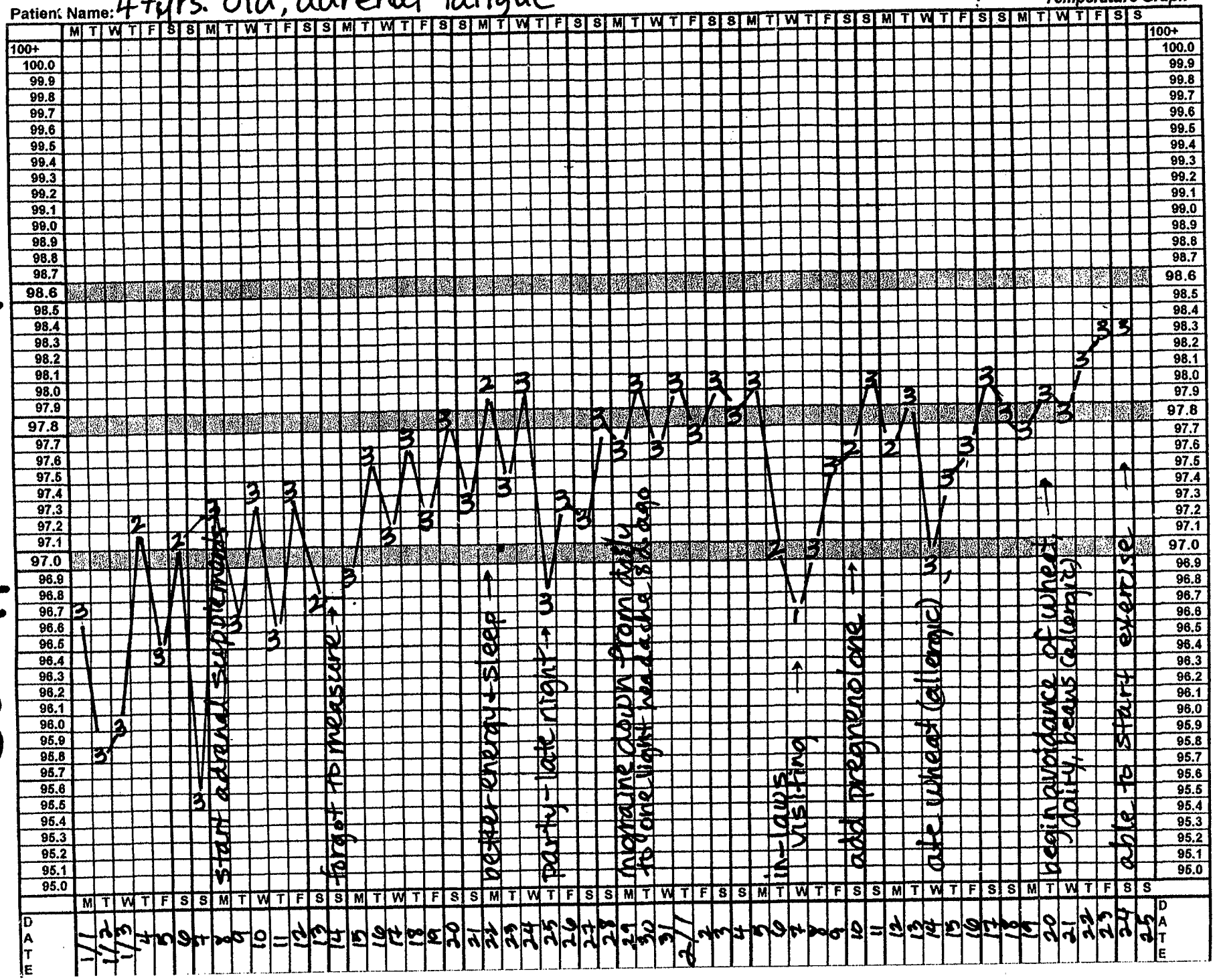
Mary

Center for Holistic Medicine

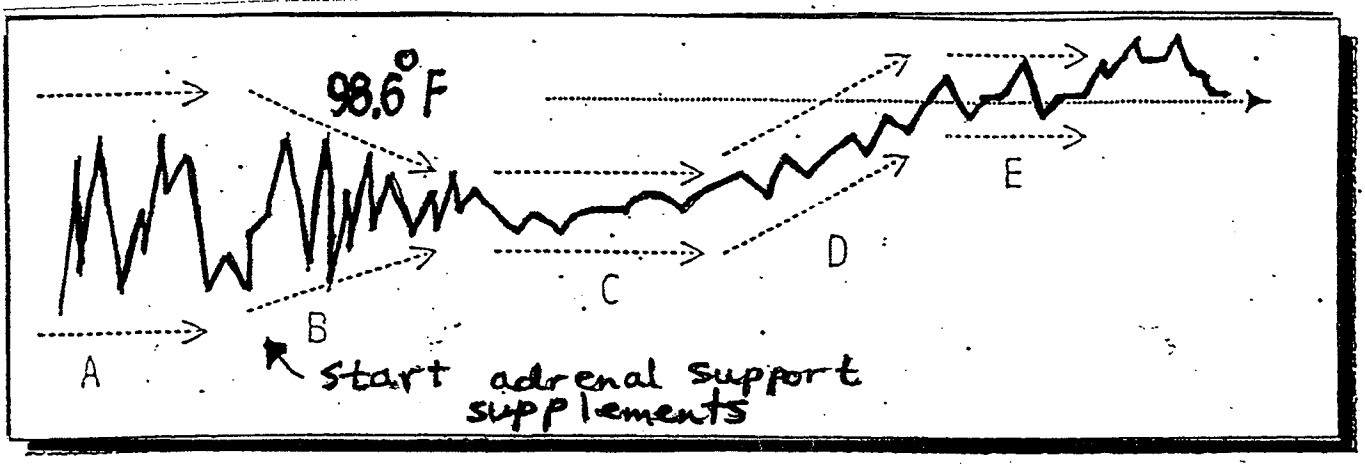
Bruce Rind, MD

Patient Name: 47yrs. old, adrenal fatigue

Temperature Graph



Ideal pattern: thermal graph for adrenal correction



A. **Unstable temps:** adrenal fatigue. Core temperatures have wide variations. They tend to rise in warm weather and fall in cold weather.

B. **Decreasing variability:** with adrenal support, as the adrenal gland function improves, variability decreases (temps. more stable)

C. **Low but unstable:** after the temperatures have stabilized they still remain low but relatively stable.

D. **Stable and rising:** after a period of being stale, the next phase of improvement is a gradual rise in average core temperature.

E. **Stable 98.6° F:** This is typical of a healthy metabolic state.

If the adrenal support is working well, phases A through D can each last from one week to several months depending on the individual. In any given individual each of the phases seem to last approximately the same length of time (i.e. short vs. long time). Phase E is hopefully permanent. If the adrenal fatigue is more severe (usually of longer duration), each of phases A through D tends to last longer and phase E tends to be less secure.

How to Measure the Temperature

- Temperatures are measured orally, approximately three hours apart, starting approximately three hours after waking up and at rest (not after climbing a flight of stairs or eating/drinking within 20 minutes). For example, if you have up at 6 a.m., measure the temperatures at 9 a.m., 12 noon, and 3 p.m.
- Plot the daily average.
- Indicate where any changes in prescription(s) or stressors take place (see above example).
- Instead of a dot or "X" in each box, use a number that reflects the number of temps from which the average was derived. Thus | 3 | indicates that this is the result of three temps, and | 1 | indicates only one temp was taken that day.

Center for Holistic Medicine

Bruce Rind, MD

Patient Name:

Temperature Graph

	M	T	W	T	F	S	S	M	T	W	T	F	S	S	M	T	W	T	F	S	S	M	T	W	T	F	S	S	M	T	W	T	F	S	S	M	T	W	T	F	S	S	M	T	W	T	F	S	S	
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Additional blank temperature graphs can be downloaded from the website: www.DrRind.com