

Adrenal Fatigue

Michael Lam, MD, MPH
www.DrLam.com

Reading Tips

For fast reading, scan through the topic headings in **BOLD BLACK**, important conclusions in **BOLD BLUE**, and " Must Know " in **BOLD RED**. To jump to specific sections in this article, click on the respective **LINKS** in the Contents.

Click [here](#) to take Dr.Lam's short questionnaire to find out if you suffer from Adrenal Fatigue.

INTRODUCTION TO ADRENAL FATIGUE SYNDROME

Fatigue and lethargy is one of the most common complaints amongst adult patients. **If you have symptoms such as tiredness, fearfulness, allergies, frequent influenza, arthritis, anxiety, depression, reduced memory and difficulties in concentrating, insomnia, worn-out, inability to loose weight after extensive efforts, you may be suffering from adrenal fatigue (technically known as hypoadrenia).**

Adrenal fatigue has a broad spectrum of non-specific yet often debilitating symptoms. The onset of this condition is often slow and insidious. Patients are told that they are stressed and need to learn to relax more. Yes, we all know that "stress kills" to a large extent. But, the question is how?

The real truth is that **stress** and adrenal fatigue **is not a mysterious entity at all**. Our body has a built-in mechanism to deal with it. Being able to handle stress is a key to survival, and the control center in our bodies is the adrenal glands. **Adrenal Fatigue is when our adrenal glands become fatigued and unable to handle stress.**

Adrenal fatigue was first described in the medical texts in the 1800s as a clinical condition. It was one of the most prevalent conditions, **afflicting almost every adult in one way or another**. Despite effective diagnostic tools and treatment programs, most conventional physicians were simply not informed of adrenal fatigue and not prepared to take adrenal fatigue as a serious threat to health. **This condition was seldom diagnosed as a sickness for the past 50 years.** Instead, adrenal fatigue was considered as a condition whereby no treatment was available other than to tell people to "relax" and take anti-depressants. This often makes the condition worse as the root cause is left unresolved. Over time, the condition worsens as the natural progression of this pathology takes its course.

Adrenal fatigue should not be confused with another medical condition called Addison's disease where the adrenal glands are not functioning. **While Addison's disease is often caused by auto-immune dysfunction, adrenal fatigue is largely caused by stress.** Adrenal fatigue is the non-Addison's form of adrenal dysfunction. Unfortunately, conventional medicine only recognizes Addison's disease as hypoadrenia, despite the fact that adrenal fatigue is a fully recognizable condition. As such, do not be surprised if your doctor is unfamiliar with this condition.

Signs and Symptoms of Adrenal Fatigue

- **Tendency to gain weight and unable to lose it**, especially around the waist.
- **High frequency of getting the flu** and other respiratory diseases and these symptoms tend to last longer than usual.
- **Tendency to tremble when under pressure.**
- **Reduced sex drive.**
- **Lightheaded when rising from a laying down position.**
- **Unable to remember things.**
- **Lack of energy in the mornings and also in the afternoon between 3 to 5 pm.**
- **Feel better suddenly for a brief period after a meal.**

- Often feel tired between 9 - 10 pm, but resist going to bed.
- **Need coffee or stimulants to get going in the morning.**
- **Crave for salty, fatty, and high protein food such as meat and cheese.**
- **Increase symptoms of PMS for women;** period are heavy and then stop, or almost stopped on the 4th day, only to start flow again on the 5th or 6th day.
- **Pain in the upper back or neck with no apparent reasons.**
- **Feels better when stress is relieved,** such as on a vacation.
- **Difficulties in getting up in the morning**
- **Lightheaded**

Other signs and symptoms include:

- | | | |
|---|--------------------------------------|---|
| • Mild depression | • Decreased ability to handle stress | • Palpitation |
| • Food and or inhalant allergies | • Dry and thin skin | • Unexplained hair loss |
| • Lethargy and lack of energy | • Hypoglycemia | • Alternating constipation and diarrhea |
| • Increased effort to perform daily tasks | • Low Body Temperature | • Dyspepsia |
| | • Nervousness | |

If you have many of these signs and symptoms, it is time you consider adrenal fatigue as a possible cause once you have ruled out other organic pathologies. None of the signs or symptoms by itself can definitively pinpoint adrenal fatigue. When taken as a group, these signs and symptoms do form a specific adrenal fatigue syndrome or picture - that is - of a person under stress. **These signs and symptoms are often the end result of acute severe or chronic excessive stress and the inability of the body to reduce such stress.** Stress, once a "basket" term used by physicians to explain non-specific symptoms undetectable by conventional blood test, is of no mystery to the body at all.

The ability to handle stress, physical or emotional, is a cornerstone to human survival. Our body has a complete set of stress modulation system in place, and the control center is the adrenal glands. When this gland becomes dysfunctional, our body's ability to handle stress reduces.

ADRENAL GLANDS BASICS

The adrenal glands are two small glands, each about the size of a large grape. They are situated on top of the kidneys. Their purpose is to help the body to cope with stress and help it to survival. Each adrenal gland has two compartments. **The inner or medulla** modulate the sympathetic nervous system through secretion and regulation of two hormones called epinephrine and nor epinephrine that are responsible for the fight or flight response. **The outer adrenal cortex** comprises 80 percent of the adrenal gland and is responsible for producing over 50 different types of hormones in three major classes - glucocorticoids, mineralcorticoids and androgens.

The most important glucocorticoid is cortisol. When this is lowered, the body will be unable to deal with stress. This happens in adrenal fatigue.

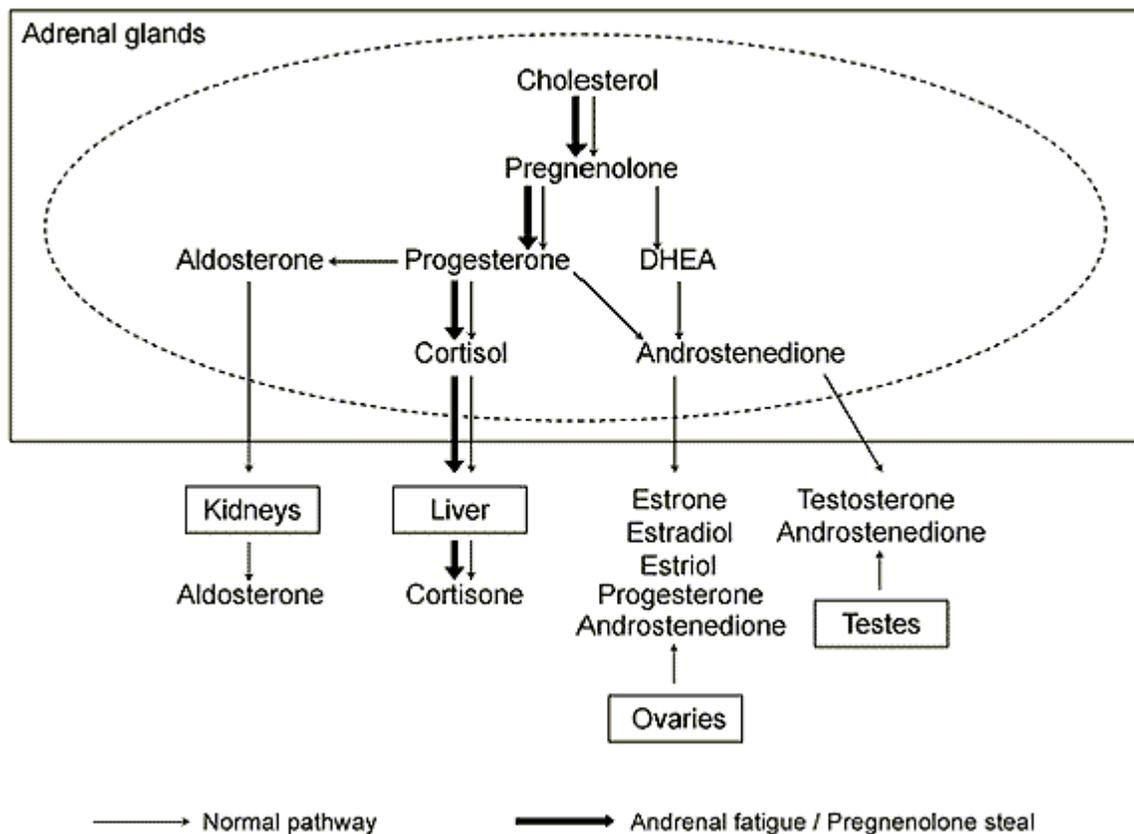
Mineralcorticoids such as aldosterone modulate the delicate balance of minerals in the cell, especially sodium and potassium. It therefore regulates our blood pressure and fluid in the body. Stress increases the release of aldosterone, causing sodium retention (leading to water retention and high blood pressure) and loss of potassium and magnesium in early stages of adrenal fatigue. Magnesium is involved in over 300 enzymatic reactions in the body. When the body lacks magnesium, it will suffer from a variety of pathological conditions such as cardiac arrhythmias and uterine conditions like fibroids and endometriosis.

The adrenal cortex is also responsible for producing all sex hormones, although in small amounts. One exception is DHEA, a weak androgenic hormone that is made in large amounts in both sexes. DHEA, together with testosterone and estrogen, are made from **Pregnenolone.**

Pregnenolone also leads to the production of progesterone and as one of the intermediary steps in the making of cortisol. **Pregnenolone is therefore one of the most important intermediate hormones being produced in**

the hormonal cascade. Prolonged deficiencies in pregnenolone as that in adrenal fatigue will lead to reduction of both glucocorticosteroids and mineralcorticoids such as cortisol and aldosterone respectively.

Steroid Hormone Synthesis Pathways



Cortisol (The Hormone of Death)

The most important anti-stress hormone in the body is cortisol. Cortisol protects the body from excessive and adrenal fatigue by:

Normalizes blood sugar - Cortisol increase blood sugar level in the body, thus providing the energy for the body to physically escape threat of injury in order to survive. Cortisol works in tandem with insulin from the pancreas to provide adequate glucose to the cells for energy. More energy is required when the body is under stress from any source, and cortisol is the hormone that makes this happens. In adrenal fatigue, more cortisol is secreted during the early stages. In later stages of adrenal fatigue (when the adrenal glands become exhausted), cortisol output is reduced.

Anti-inflammation Response - Cortisol is a powerful anti-inflammatory agent. When we have a minor injury or a muscle strain, our body's inflammatory cascade is initiated, leading to swelling and redness commonly seen when an ankle is sprained or an insect bite. Cortisol is secreted as part of the anti-inflammatory response. Its objective is to remove and prevent swelling and redness of other tissues that haven't been injured. These anti-inflammatory responses prevent mosquito bites from enlarging, bronchial tress and eyes from swelling shut from allergies, and adrenal fatigue.

Immune System Suppression - People with high cortisol levels are very much weaker from the immunological point of view. Cortisol influences most cells that participate in the immune reaction, especially white blood cells. Cortisol suppresses white blood cells, natural killer cells, monocytes, macrophages, and mast cells. It also suppresses adrenal fatigue.

Vaso-constriction - Cortisol contracts mid-size arteries. People with low cortisol (as in advance stages of adrenal fatigue) have low blood pressure and reduced reactivity to other body agents that constrict blood vessels. Cortisol tends to increase blood pressure that is moderated.

Physiology of Stress - People with adrenal fatigue cannot tolerate stress and will then succumb to severe stress. As their stress increases, progressively higher levels of cortisol are required. When the cortisol level cannot rise in response to stress, it is impossible to maintain the body in optimum stress response. In this respect, we can conclude that stress does kill.

In summary, **cortisol sustains life via two opposite but related kinds of regulatory actions: releasing and activating of existing defense mechanisms of the body and shutting down and modifying the same mechanisms to prevent them.**

Cortisol Regulation

The adrenal glands are controlled via the hypothalamus-pituitary-adrenal (HPA) axis. There is an existing negative feedback loop that governs the amount of adrenal hormones secreted under normal circumstances in people with adrenal fatigue. For example, the HPA axis adjusts cortisol levels according to the body's need via a hormone called Adrenal Corticotrophic Hormone (ACTH) that is secreted from the pituitary gland in response to signals from the hypothalamus. When the ACTH binds to the walls of the adrenal cells, a chain reaction occurs within the cell. This leads to the release of cholesterol where it is manufactured into pregnenolone, the first hormone in the adrenal cascade. After this, cortisol is released into the blood stream where it travels in the circulatory system to all parts of the body and back to the hypothalamus, where it is neutralized.

Cortisol and ACTH are not secreted uniformly throughout the day. They follow a diurnal pattern, with the highest level secreted at around 8:00 a.m. in the morning after which there is a gradual decline throughout the day. Episodic spikes during the day can also occur when the body is stressed or when certain foods are taken. The cortisol level is at its lowest between midnight and 4:00 a.m.

COMMON CAUSES OF ADRENAL FATIGUE

Chronic stress is very common in the western society. The most common causes of stress are work pressure, death of a love one, moving house, changing jobs, illness and marital disruptions. Adrenal fatigue occurs when the amount of stress overextends the capacity of the body to compensate and recover from stress.

Stressors that can lead to adrenal fatigue include:

- Anger
- Chronic fatigue
- Chronic illness
- Chronic infection
- Chronic pain
- Depression
- Excessive exercise
- Fear and guilt
- Gluten intolerance
- Low blood sugar
- Mal-absorption
- Mal-digestion
- Toxic exposure (chemicals, medications, drugs, food additives, preservatives, etc...)
- Severe or chronic stress
- Surgery
- Late hours
- Sleep deprivation
- Excessive sugar in diet
- Excessive caffeine intake from coffee and tea

One of the most commonly overlooked causes of adrenal fatigue is chronic or severe infection that gives rise to an inflammatory response. Such infection can occur sub-clinically with no obvious signs at all. Parasitic and bacterial infections including Giardia and H. pylori are often the main culprits.

HOW STRESSORS AFFECT THE BODY

When a person is stressed, the body reacts by mounting a stress response through the stimulation of the sympathetic nervous system. This is also called the "fight or flight" response as the body arms itself to face what it perceives as danger. When this happens, epinephrine is secreted from the adrenal medulla, and the hypothalamus-pituitary axis is stimulated to release ACTH, which in turn causes the adrenal cortex to increase production of the anti-stress hormone cortisol.

When a person experiences chronic stress, the cortisol level may rise to such a high level that its production reduces as the adrenal becomes exhausted. At the same time, DHEA, a hormone normally produced in the adrenal glands, will start to decrease with stress without hitting a peak first (as in the case of cortisol). With chronic stress, there is decompensation of DHEA with concurrent rise of cortisol. As a result, the ratio of cortisol to DHEA increases.

As with most hormonal systems, there is a negative feedback system in the body to limit the production of each hormone. The same occurs in the case of cortisol, with one exception. **During prolonged or acute stress when the body perceives that its survival is at stake, the excessive cortisol output actually blunts the negative feedback response. In other words, instead of a negative feedback system to shut down cortisol production when the total cortisol is high, the body reacts in the opposite way. As cortisol is the anti-stress hormone, the body will interpret a very high cortisol level and impending danger. When this happens, the high cortisol exerts a dampening effect on the negative feedback system instead in order that we can survive this threat. More cortisol will therefore be produced.** This is the body's way to ensure that we can cope with the on-going stress that threatens its survival.

When our body is stressed, our cortisol level rises in an environment where the negative feedback system is dampened. While this is happening, our DHEA level continues to drop. The result is a **high cortisol to DHEA ratio and:**

1. Reduced insulin sensitivity, reduced glucose utilization and **increased blood sugar, which lead to diabetes.**
2. Reduced secretory IgA (the main cellular defense factor), natural killer (NK) cell and T-lymphocyte activity. This leads to **increase chances of getting infections such as Herpes, yeast overgrowth, and viral infections.**
3. Increased loss in bone mass as calcium absorption is blocked and demineralization of bone occurs, thus leading to **osteoporosis.**
4. Increased fat accumulation around the waist and protein breakdown, thus leading to **muscle wasting and inability to reduce weight.**
5. Increased water and salt retention, leading to **high** blood pressure at first, with **low** blood pressure as the condition worsen
6. **Estrogen dominance**, leading to PMS, uterine fibroids, and breast cancer.

STRESS RESPONSE From a Hormonal Perspective

At work, what happens if your boss screams at you? Let us now examine some of the effects within our body from a hormonal perspective.

- Your hypothalamus signals your pituitary gland to release ACTH.
- The ACTH will stimulate the adrenal medulla to secrete epinephrine, and the adrenal cortex to secrete cortisol, among other hormones.

- Your cortisol level will increase and convert more stored glycogen into blood sugar for energy. Energy is also increased from the release of epinephrine from the adrenals.
- Your heart rate will increase (from the epinephrine)
- You will tend to sweat more (from cortisol)
- Your muscle tension will increase (from cortisol and epinephrine)
- Your digestion will slow down as blood is diverted away to more important tissues.
- Your bladder and rectum muscle may relax.

When the above physiological response occurs over a long duration or in certain cases when there is acute stress, then adrenal fatigue can result as the adrenal glands become worn out.

ADRENAL FATIGUE PROGRESSION

Diseases progresses through stages normally as the body decompensates. Let us take a closer look:

Stage 1: Alarm Reaction (Flight or Fight response)

In this stage, the body is alarmed by the stressors and mounts an aggressive anti-stress response to reduce stress levels. Some doctors called this the Early Fatigue stage.

Typically, there is an increased ACTH from the pituitary gland that stimulates the adrenal glands into full gear to mount a retaliation response. The adrenal medulla is stimulated to secrete more epinephrine, and the total cortisol output from the adrenal cortex is increased from the excitatory stimulus. There is a corresponding reduction in DHEA production. **During this period, the body needs cortisol to overcome stress, and production of cortisol is therefore increased. After some time, the adrenals will experience difficulties in meeting the body's ever increasing demand for cortisol.**

Stage 2: Resistance Response

With chronic or severe stress, the adrenals eventually are unable to keep up with the body's demand for cortisol. As such, the cortisol output will start to decline from a high back to a normal level, while the ACTH remains high. With protracted ACTH and adrenal fatigue, less cortisol is produced due to the adrenal becoming exhausted. While the morning, noon, or afternoon cortisol levels are often low, the night time cortisol level is usually normal. **Anxiety starts to set in, and the person becomes easily irritable. Insomnia becomes more common, as it takes longer to fall asleep. There is also frequent awakening as well. Infections can become more recurrent. PMS and menstrual irregularities surface, and symptoms suggestive of hypothyroidism (such as a sensation of feeling cold and sluggish metabolism) become prevalent.**

A phenomenon called "pregnenolone steal" (also called "cortisol shunt") sets in. Cortisol production becomes the predominant pathway of hormone production as the body favors the production of this hormone. Other hormones such as pregnenolone, DHEA, testosterone and estrogen are less favoured and their production will decline. As a result, total pregnenolone output is reduced but total cortisol output continues to be maintained at a normal level. Careful analysis of the daily diurnal cycle of cortisol shows a dysfunctional pattern of abnormally low cortisol in the morning. This is a time when cortisol is needed the most. Nighttime cortisol is usually still normal.

Stage 3: Adrenal Exhaustion

Despite rising ACTH, the adrenals are no longer able to keep up the increased demand for cortisol production. This may happen over a few years. Total cortisol output is therefore reduced, and DHEA falls far below average. The night time cortisol level is usually reduced as the hypothalamic-pituitary-adrenal axis "crash" and the body is unable to maintain homeostasis. **Early in this stage, mild symptoms characteristic of first and second stage adrenal fatigue continues to worsen and becomes persistent or chronic. As the condition gets worse, multiple endocrine axis imbalances tend to occur. This is commonly manifested in the form of ovarian-adrenal-thyroid (OAT) axis imbalance in female and adrenal-thyroid axis imbalance in the male.** As the body continues its downward path of impaired function, it gathers steam. **Gradually, the body becomes severely compromised in trying to maintain the fine controls of homeostasis. Normal equilibrium is therefore lost.** The body enters a state of reactive disequilibrium.

The body will try its hardest maintain equilibrium with activation of the autonomic nervous system (ANS), but its crude response and damaged receptor sites along with impaired metabolic, clearance, and detoxification pathways give rise to paradoxical, unpredictable, and exaggerated outcome. Reactive sugar imbalances, fragile blood pressure, postural hypotension, heart palpitations, POTS, dizziness, anxiety reactions, being "wired and tired", periodic adrenaline rushes, fragile fluid state such as hypersensitive dilutional hyponatremia, sudden onset of anxiety and sensation of impending doom are common. There is a strong mind-body connection. No system is spared as every thought process invokes physiological responses. **Many of these symptoms represent what is known as a "reactive sympathoadrenal response". This response is the result of over-activation of two components of the ANS - the sympathetic nervous system (SNS) and the adrenomedullary hormonal system (AHS). Collectively, these two components constitute the sympathoadrenal system (SAS). When the SAS is over-activated due to stress, the body is bathed in a sea of adrenaline and norepinephrine.** These two hormones are responsible for many of the above mentioned symptoms.

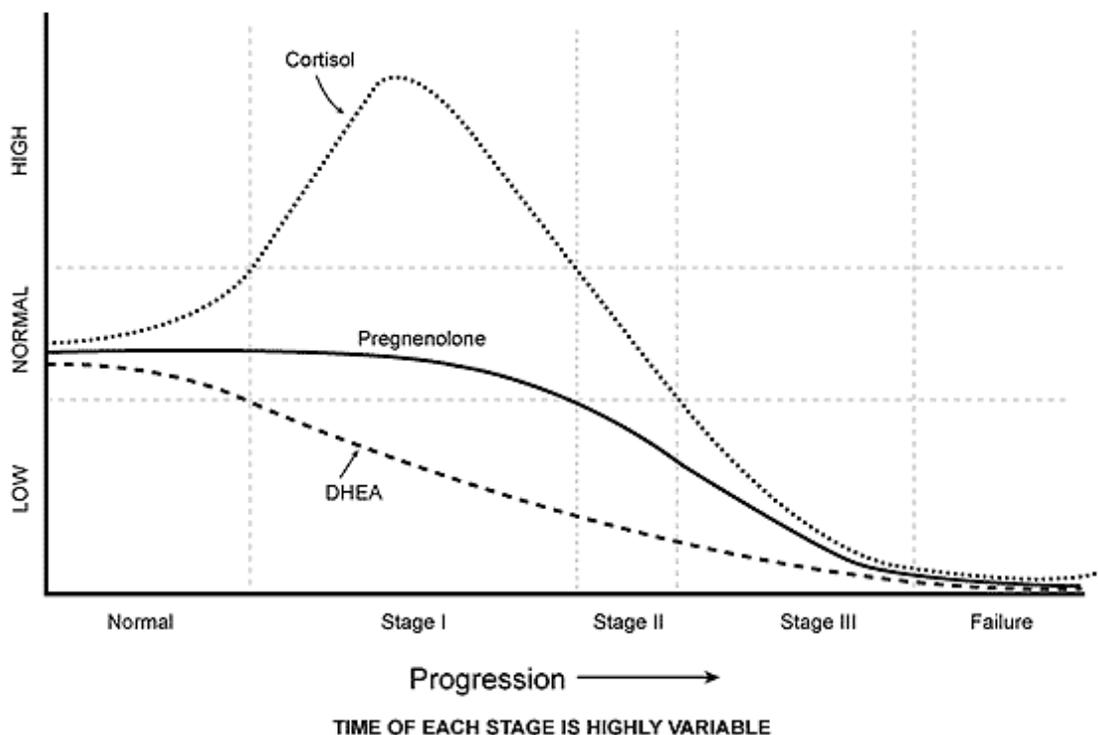
Finally, as the body's key hormones, such as cortisol, falls below the minimum required reserve for normal function and output fails, the body may down-regulate the amount needed in order to preserve what is on hand for only the most essential body functions. This near-failure state is quite serious and requires professional attention. **This is a state of extreme low energy as the body tries to conserve to survive. Nutrients that normally are helpful may be blunted in this action and indeed may backfire with paradoxical responses being the hallmark.** Traditional macro-nutritional approaches may be helpful but the clinical outcome overtime is often blunted and may fail if the body continues to decompensate. In such a case, a carefully titrated micro-nutritional program may be necessary to facilitate restoration of equilibrium.

Stage 4: Failure

Eventually, the adrenals are totally exhausted. When adrenal fatigue has advanced to this stage, **the line between it, sub-clinical and clinical Addison's disease, also called adrenal insufficiency, can be blurry.**

Typical symptoms of Addison's Disease may start to emerge. **Fatigue becomes extreme, with weight loss, muscle weakness, loss of appetite, nausea, vomiting, hypoglycemia, headache, sweating, irregular menstrual cycles, depression, and orthostatic hypotension, dehydration, and electrolyte imbalances.** **The body appears to have lost its normal homeostasis and is breaking down.** If not attended to, the natural progression of this condition may be fatal.

Progression of Stages of Adrenal Exhaustion



Why Conventional Medicine Missed

Despite sub-clinical Adrenal Fatigue with its various stages, as was recognized as a distinct clinical syndrome since the turn of the 20th century, most doctors are unfamiliar with this condition for the simple reason that it is **difficult to diagnose effectively by traditional blood test**. Normal blood tests are designed to detect severe absolute deficiency of adrenal hormones known as Addison's disease. This disease afflicts only 4 out of 100,000 and is often the result of auto-immune disease or infectious origin. Blood tests are also useful to detect extreme excessive levels of adrenal hormones in a condition known as Cushing's disease.

Let's examine this in more detail. The conventional test used is called the ACTH (adrenocorticotrophic hormone) challenge test. This test recognizes extreme underproduction or overproduction of hormone levels, as shown by the top and bottom 2 percent of a bell curve. In other words, adrenal function has to be extreme low (the bottom 2 percent) before a diagnosis is made. Symptoms of non-Addison's adrenal malfunction, meanwhile, can start to present itself symptomatically after 15 percent deviation from the mean on the bell curve. Therefore, the adrenal glands could be functioning anywhere from 15-48 percent below the norm and not detected by the ACTH test.

To sum it up, adrenal hormones are low in the case of Adrenal fatigue, but still within the "normal" range and not low enough to warrant the diagnosis of Addison's disease by regular blood tests. Such "normal" level of adrenal hormones does not mean that the patient is free from adrenal malfunction. Conventional doctors are not taught the significance of sub-clinical Addison's Disease, or Non-Addison's Hypoadrenia (commonly referred to as adrenal fatigue). They are misguided by blood tests. **As a results, patients tested for adrenal functions are told they are "normal" but in reality, their adrenal glands are performing sub-optimally**, with clear signs and symptoms as the body cries out for help and attention.

LABORATORY TEST

Adrenal fatigue has been demonstrated in laboratory studies of surrogate markers of adrenal function. Two such markers used are **cortisol and DHEA by serum**. **These two markers by blood give a general picture of the body as to whether it is in anabolic (build up) or catabolic state (breakdown). It is not diagnostic.**

Another way to test your adrenal health is to measure your level of free key adrenal hormones such as cortisol and DHEA. **Saliva testing is preferred as it measures the amount of free and circulating hormones and thus more accurate , but** again, this is not diagnostic.

DHEA can be measured anytime during the day. Cortisol, on the other hand, is the highest in the morning and lowest in the evening before bedtime. Taking 4 samples of cortisol (at 8 am, noon, 5 pm, and before bedtime) is desirable if saliva test is undertaken. With multiple samples taken throughout the day, we are able to map the daily diurnal curve of free cortisol in the body relative to DHEA level. This will give us a much clearer picture of adrenal function.

If you are taking oral or applying topical supplemental hormone creams such as DHEA or pregnenolone, the saliva test results may be elevated immediately. Blood test results will also increase, but it will take about 3 months to show.

Stress can also affect the levels of adrenal hormones. Your cortisol level tested after a quiet and relaxing morning will be very different from that taken when you are under tremendous stress.

To rule out sub-clinical infection as a cause of adrenal fatigue, specialized test measuring the immunoglobulin response may be necessary as normal culture for bacteria and parasites will often be negative.

WARNING: Due to tremendous individual variance and the body's constant changing state, laboratory tests should be undertaken judiciously under the right setting and only when needed in order to be cost-effective and relevant. It is not uncommon to have adrenal fatigue symptoms with "normal" laboratory results, and vice versa. Furthermore, in advance adrenal fatigue, the 24 hour cortisol curve invariably becomes flattened most of the time and can stay that way for an extended period of time, even during recovery. **Therefore, one can be easily confused as test results can be misleading.** Over-reliance on test is a common adrenal recovery mistake.

A good history by an astute and experienced clinician is by far the best and most accurate way to ascertain adrenal fatigue status and is far better than any laboratory testing.

Laboratory tests are best used as supporting tools under the guidance of the right health professional and should not be relied on as a sole gauge of adrenal function and therapeutic options. Consumers often make the mistake of embarking on a self-guided nutritional recovery program that relies on laboratory test without understanding their limitations. Over time, this approach often leads to improper use of nutrients which makes the condition worse.

Paradoxical Reactions

In adrenal fatigue, the body can often exhibit multiple paradoxical reactions that one does not normally expect. These include:

- a. A sense of fatigue or malaise instead of a sense of calm when taking steroids
- b. A sudden onset of anxiety attacks and impending doom at rest
- c. Sudden onset of heart palpitations despite normal cardiac function
- d. Sudden onset of dizziness and light-headedness at rest, or after stressful situation, or after taking certain types of food, especially carbohydrates.
- e. Sudden onset of fluctuating blood pressure
- f. Staying in bed for an extended period of time with no energy to get up even after a full night's rest
- g. A sense of being "beaten up" that lasts for days after vigorous exercise
- h. Inability to think clearly and difficulty recalling even a recent problem
- i. Waking up in the middle of the night for no reason and the inability to go back to sleep
- j. Being constipated instead of having loose bowel when taking high doses of vitamin C or magnesium
- k. A sense of getting wired up and anxious after taking Vitamin C, adrenal glandular, or herbs
- l. Getting more toxic instead of feeling better when going through a detoxification program like juice fasting.
- m. Sudden onset of fragile emotional states such as crying for no apparent reason
- n. Taking multiple trips to the Emergency Room because one feels impending doom even though one is told that nothing is wrong after a complete work-up.
- o. A sense of well-being after taking selected nutrients, only to be followed by a "crash"
- p. Fluid retention/depletion in a setting that is highly sensitive to sodium load that is hard to maintain.

One can have any combination of the above. The exact pathophysiology of each of these symptoms is not fully known. **Collectively, they point to an adrenal that has lost its ability to maintain the fine control necessary of a stable internal homeostasis environment. Self-directed recovery programs normally fail in such cases because normal healing tools do not apply. It is best to consult a professional for help if you have a significant number of these paradoxical reactions.**

WOMEN AND ADRENALS

Ovarian Adrenal Thyroid (OAT) Axis Imbalance. There are very strong interlinked relationships between the ovarian, adrenal, and thyroid systems in the women. These three organs are intimately co-dependent on each other for optimal function. This axis, also called the **Ovarian Adrenal and Thyroid axis (OAT), must be balanced if a woman wants to feel good. When medication alters one of the organ's functions, it will invariably lead to an often unrecognized change in the other two organs.** For example, if thyroid medication is administered, it is not uncommon to see concurrent menstrual irregularities, a function of ovarian hormones, and reduced ability to deal with stress, a function of the adrenals.

Let us look more closely at the reason. **In adrenal fatigue, internal cortisol often creates a condition of multiple organ resistance, including the thyroid and ovaries.** Thyroid tissues fail to respond as efficiently to the hormonal signal. **Adrenal fatigue is often accompanied by clinical or sub-clinical hypothyroidism.** Laboratory values can be normal but classical signs of hypothyroidism may be present. Physicians and patients alike are often confused. Anti-depressants are often prescribed as a solution. However, this seldom works but will instead often make the condition worse.

A cortisol induced organ resistance applies to nearly all other hormone regulated organs including the ovaries and the pancreas. **Few hormones are allowed to work at optimal levels in the presence of adrenal fatigue.** A multitude of hormones including insulin, progesterone, estrogen, and testosterone become affected. The normal negative feedback loop in place can be disrupted. The ability of each hormone to regulate and fine tune its target organ to achieve homeostasis is often compromised. **Blood pressure can become erratic, blood sugar levels may experience wide swings, bipolar and anxiety states come at will, and menstrual flow can become irregular.** Even the brain may become less sensitive to estrogen.

Let us look more closely at how the ovarian system is affected in particular. Today, women often have exhausted adrenal glands by the time they reach their mid-thirties or early forties due to a stressful lifestyle. Stress is primarily regulated by our adrenal glands. In early stages of adrenal fatigue, cortisol output is high as the body attempts to neutralize the stress by producing more of it. However, when too much cortisol is produced, it will have multiple undesirable effects. For example, cortisol blocks progesterone receptors, making them less responsive to progesterone. Progesterone normally produced by the adrenals comes to a halt in favour of cortisol. Insufficient progesterone production leads to an imbalance of estrogen to progesterone. With reduced progesterone to offset estrogen, the body may experience a host of undesirable side effects associated with excessive estrogen. **This leads to a condition known as estrogen dominance. It is no coincidence that we see a proliferation of conditions associated with excessive estrogen such as PMS, fibroids, and premenopausal syndrome when women reach their mid thirties and early forties.**

It is interesting to note that most post-menopausal women who are experiencing hair loss have an adrenal function problem. Hair loss is a sign of excessive androgen. Some women tend to produce too much androstenedione, which then gets converted into estrone and testosterone. Testosterone in turn is converted into DHT, the more potent form of testosterone largely responsible for excessive hair loss. Estriol can be given to offset the testosterone effects as estrogen balances testosterone in the body. Cortisol can be considered when closely supervised and used for a short period of time. It keeps the adrenal glands from getting stuck in the androgen part of the stress cycle if indeed it is in that state. Cortisol also complements the use of progesterone as well. The effective cocktail therefore consists of estriol, cortisol and progesterone. Each of these hormones, especially cortisol, has their own side-effects. Knowing what to use and when to use is critical, or hair loss could worsen.

Any serious attempt to normalize this axis should consider adrenal recovery as the first step. Adrenal normalization should precede hormone modulation. The adrenal glands deal with the daily stresses of life. A woman must normalize her adrenal glands in order to have a total body hormonal balance. In fact, replacement of deficient hormones alone without addressing the overall health of the adrenal gland is a band-aid approach and is often ineffective in the long run. The normalization process can begin with investigating and eliminating stressors. Stressors are often chronic in nature, and can be related to lifestyle, dietary, mental, and inflammatory causes. **Women with heavy menstrual bleeding and adrenal exhaustion can normalize their adrenal functions with natural compounds to boost internal cortisol production,** adequate sleep, proper diet, and nutritional supplementation before considering progesterone therapy. **Exogenous cortisol replacement should only be considered as a last resort due to its long term negative effects.**

Often times, the use of anti-depressants, thyroid replacements, and ovarian hormones often make women with OAT axis imbalance worse. Estrogen replacement often becomes ineffective, and symptoms of estrogen dominance like hot flashes, weight gain at the hips, water retention, and moodiness are commonly observed despite normal estrogen levels. Patients become frustrated as it seems that nothing can help when a downward spiral of multiple symptoms commonly surface: depression, insomnia, fatigue, metabolic and hormonal imbalances. Failing conventional therapy, many turn to natural compounds. It is not unusual to see many people take a full battery of these nutrients. For example, Vitamin C, DHEA, pregnenolone, natural progesterone, and natural thyroid replacement, just to name a few. In the beginning, this might be helpful. **Unfortunately, a short-gun approach by taking many nutrients seldom works and often backfire with time. The higher the dose the worse the patient can become.** That is why chronic stress and adrenal fatigue can make one feel so rotten, like a slow-motion train wreck in progress. In severe cases, the patient often feels like the "walking dead" caught in a vicious downward cycle of deteriorating physical and emotional functions.

ADRENAL FATIGUE PROTOCOL

Attention

Because of tremendous individual variation, the use of nutritionals should therefore be personalized for your body. One person's nutrient can be another person's toxin. If you have a specific health concern and wish my personalized nutritional recommendation, write to me by [clicking here](#).

NOTE: Adrenal Fatigue can be reversed. You may need to allow 6 months to 2 years for the recovery process to take place. These are some of the important steps:

1. Removal of the stressors. This is the most important step. Emotional stressors such as marital, family, relationship, or financial problems needs to be dealt with and normalized.

2. Sleep. The most important is to have enough rest. It is important to go to sleep by 10 p.m. every night. Why? This is because our adrenal glands kick in for a "second wind" to keep us going from 11 pm to 1 am. This puts tremendous stress on the adrenals. When we rest early, our adrenals are fully rested and the high gear is avoided. **Between 10 p.m. and 1 a.m., our adrenals work the hardest to repair the body.** We should also try to sleep in until 8:30 a.m. or 9:00 a.m. if possible. This is because our cortisol level rises to its peak from 6:00 a.m. to 8:00 a.m. in order to wake us up and get us going for the day.

In later stage adrenal fatigue, the level of cortisol falls and we feel tired. It will be more difficult to wake up. If we were to wake up too early, this will only increase stress on the adrenal glands, which will have to produce more cortisol when it is already exhausted.

A good night sleep is therefore mandatory. Without a good sleep, our bodies cannot regenerate itself to deal with stressors the next day. We should also rest in a completely dark room to maximize melatonin production.

If you are unable to fall asleep, take oral melatonin (0.5 mg to 3mg) 30 minutes before bedtime. You may begin with a low dose (0.5 mg) and gradually work upwards. If you start with 3 mg, the common over-the-counter dose and find it not helpful, go to a lower dose instead. **The right dosage varies from person to person.**

If you have a tendency to wake up at 2 to 3 a.m. and find that you are unable to fall back to sleep, that is a sign of excessive stress. In this case, you may wish to consider a time-release melatonin. You may also wish to try other sleep aids such as 5-hydroxytryptophan (5-HTP) 50-100 mg, adrenal extracts, and trace mineral tablets. Another wonderful relaxant and sleep aid is magnesium. Some common herbs that enhance sleep are valerian (root), hops (whole plant), and licorice (root).

3. Avoid Coffee or Caffeinated Beverages. Coffee and tea act as stimulants and interrupt sleep pattern. Herbal tea is acceptable because it does not contain caffeine.

4. Avoid TV and Computers. Some people may be photosensitive. Watching television or working at the computer may prevent the melatonin level from rising to induce sleep. If you are one of these people, you should turn off your television or computer by around 8 p.m. at night.

5. Exercise. This is a wonderful stress reducer and a tremendous oxygenator. Exercise reduces depression,

increases blood flow, normalizes level of cortisol, insulin, blood glucose, growth hormones, thyroid, and makes you feel generally much better. The key is to adjust the level of exercise in accordance to your capacity. The more advanced your adrenal fatigue, the less you should exercise vigorously. Vigorous exercise can lead to a catabolic state and worse adrenal fatigue

Simple exercises such as brisk walking, or climbing stairs are easy to do and can be done almost anywhere. You should vary your routine so that exercise becomes fun. When exercising. You should exercise to no more than 50% of your capacity and feel fresh after each exercise session, with plenty of rest for the body to recuperate.

It is important not to over-exercise as that can further drain adrenal function and trigger adrenal crisis.

You should cover the following three categories of exercises as indicated below:

- Aerobics - such as fast walking, stairs climbing, Nordic track, swimming, and treadmill.
- Anaerobics - such as weight lifting, push-ups, sit-ups, chin-ups
- Flexibility - such as stretching, yoga, and tai chi.

6. Nutritional Supplementation. In an adrenal recovery program, it is prudent to consider optimizing the adrenal gland functions gently when they are indicated along with lifestyle and dietary changes.

An optimal balance of vitamins and minerals for optimum adrenal function can include:

A. 500 mg to 3,000 mg of **vitamin C** with bioflavonoid and synergistic co-factors. Vitamin C is perhaps the most gentle of all adrenal supporting nutrients. . It is best to get take Vitamin C in ascorbic acid and sodium ascorbate form. Avoid calcium ascorbate. Those who have a sensitive gastric system should consider mineral ascorbates. A properly personalized combination of different forms of oral vitamin C often works better than a single form. The proper delivery system also plays a critical and significant role. Nutrients are good only to the degree they can be delivered to the cell. The right combination of delivery systems (including liposomal, powdered, and capsulated) is therefore critical. **One of the most common adrenal fatigue recovery program mistakes is the lack of properly administered vitamin C dosed for the body's specific need.** Intravenous or oral liposomal delivery system is preferred.

B. Reduced **Glutathione by intravenous or by liposomal oral delivery** to enhance the effectiveness and cellular bio-availability of vitamin C, E, alpha lipoic acid, and carnitine. Glutathione acts as a liver detoxifier and helps recycle inactive oxidized vitamin C back to its reduced active form in the body after vitamin C has served its function.

C. 900 to 1,500 mg of **vitamin B5** (pantothenic acid) as most hormone production in the adrenal gland needs the co-enzyme A / pantothenic acid, a by-product of Vitamin B5, to be produced.

D. 400-800 I.U. of **Vitamin E** is another important nutrient. It is involved in at least six different enzymatic reactions in the adrenal cascade. Take 400 to 800 I.U. of vitamin E daily.

E. 1000 to 5000 I.U of **Vitamin D** is a good nutrient to support hormonal synthesis.

F. Additional nutrients that may be considered include 10,000 to 25,000 I.U of beta-carotene, selenium (100-200 mcg), magnesium (200-800 mg), lysine (1-2 gm), proline (500mg - 1gm), glutamine (1-5 gm), DHEA 15-50 mg, and pregnenolone 25-50 mg, Ribose and co-factors 2,000-10,000 mg , CoQ 300-1,000 mg, Type 1 and Type 3 collagen,

G. Adrenal glandular, adrenal extract and herbals such as ashwagandha root, licorice root , Korean Ginseng, Siberian Ginseng, ginger root, and ginkgo leaf can also be helpful for short term. They are widely promoted, Their effectiveness and adaptogenic properties seem to be most suitable for those with very mild adrenal fatigue. **Those with moderate to advanced adrenal weakness should exercise extreme caution prior to embarking on such compounds. The more advanced the adrenal fatigue, the more tendency it is for these adaptogenic compounds to behave as stimulants for reasons that is not well understood.**

Stimulating the adrenals at a time when it needs rest can therefore be devastating. They may give a short term sense of well-being but may lead to withdrawal and dependency issues long term. Some of these compounds

can trigger and adrenal crisis. Stimulating the adrenals is thus not the best long term solution. Providing the adrenals the gentle nutrients it needs to recover on its own is by far the most effective approach over time. Fortunately, there are many tools available without embarking on these compounds for total recovery for the vast majority of sufferers.

H. Steroids. Supplementing with steroids such as natural hydrocortisone or cortisone acetate in doses of 2.5 to 5 mg two to four times a day can be a safe and effective way to replenish depleted adrenals for a short time in very severe case when properly supervised. The problem with this approach is that most people will find it hard to get off once their body is used to it. An ever-increasing dose is often needed with time as the body develops tolerance. Its best to undertake this only when closely supervised by a knowledgeable physician along with a defined goal or weaning off this drug as soon as possible. The younger the person, the more this approach should be avoided unless it is absolutely necessary. Fortunately, there are many more gentler and non addictive natural compounds that are excellent and serve to help adrenal function without using steroids. **Under the hands of an experienced clinician, this approach is seldom necessary.**

It should be noted that while many practitioners use synthetic or bio-identical hormones (estrogen, progesterone, and testosterone) to modulate symptoms of fatigue and hormonal imbalance, this approach should be taken with care as it may mask the underlying root cause and worsen the overall condition over time.

The complete toolbox of natural compounds for adrenal recovery is therefore very big. Each tool serves a specific purpose. A systematic and comprehensive approach is necessary to avoid over stimulating or inadequate dosing. Proper timing is critical because each should be given only when the body is ready to assimilate, process and excrete. Knowing when and how much of each compound to use and to avoid requires extensive clinical experience if a fast-track recovery is the goal and minimization of mistakes a top priority. Improper selection, dosage, and timing is the number one cause of recovery failures. Unless adrenal fatigue is in its mildest form, selecting the right compound, dosage, delivery system to match the stage of adrenal fatigue is best left to the experienced clinician.

Warning

It is very important to understand that a short-gun approach by taking many nutrients at the same time seldom works and often backfires over time. The use of nutritional supplementation in overcoming adrenal fatigue needs to be individualized, base on each person's history, background, and body metabolic and clearance system. One person's nutrient may be another person's toxin. Each nutrient is like one bullet in the arsenal. Using the right bullet at the right time is critical. Misguided by marketing and often misinformed, many sufferers make the mistake of take a whole battery of nutrients without careful consideration and that approach seldom works long term in the case of adrenal fatigue. The more advance the condition, the more dangerous this approach. Even if some nutrients appear to work well at first, they may subsequently fail as the body developed tolerance and resistance. More is not necessarily better and may actually worsen the condition because improper administration may mask the underlying condition, creating a sense of temporary which eventually fails. Most only need a few natural compounds to get significantly better. The key is selecting the right ones.

In adrenal fatigue, the body's ability to process and assimilate nutrient is invariably compromised. Proper clearance of metabolites is a major concern. The more advance the fatigue, the less the body is able to properly clear breakdown metabolites out of the body after nutrients has serve its function. Without proper clearance, the best nutrient can accumulate and become toxic. There is no laboratory test available to measure this. Experienced clinicians use various **qualitative challenges to determine the amount of reserve capacity and clearance the adrenal has as a guide before initiating any comprehensive nutritional program. Failure to do so is a common mistake and why many self-guided program fails. Nutrients in the right dose should be administrated in a graded and step-wise approach , with follow up evaluation by a qualified health care professional.**

Attention

Because of tremendous individual variation, the use of nutritionals should therefore be personalized for your body. One person's nutrient can be another person's toxin. If you have a specific health concern and wish my personalized nutritional recommendation, write to me by [clicking here](#).

8. Eating Pattern. When our cortisol levels are at its peak from 6 a.m. to 8 a.m., we may have no appetite. Many people skip breakfast because "they are not hungry". This is because our bodies need sugar to run on. Furthermore, our body's energy requirement does not change during this period. Even a small snack is better than nothing at all and will provide the needed energy even though there is no urge to eat.

Skipping breakfast is not a good idea. If you are low on sugar, the adrenals are instructed to secrete cortisol because cortisol activates gluconeogenesis to increase blood sugar level and allow the body to function. It is therefore important to have a healthy breakfast soon after waking and not later than 10 a.m. This will prevent the body being put in a position to play "catch-up" for the rest of the day.

The best time for lunch is from 11:00 a.m. to 11:30 a.m. Sometimes, a nutritious snack between 2:00 to 3:00 p.m. will be needed to sustain our bodies through the dip in cortisol levels that occurs between 3:00 to 4:00 p.m. **Evening meals should be around 5:00 to 6:00 p.m.** Supper, if needed, should be in small quantities and low in glycemic to avoid the steep rise in blood sugar commonly seen in high-glycemic index snacks such as cakes. These snacks will cause the blood sugar to rise and a corresponding increase in insulin output.

Over time, insulin secretion becomes dysfunctional, resulting in a hypoglycemic state in the middle of the night. These symptoms are characterized by nightmares, anxiety, and night sweats. When this occurs, the body will have to activate the adrenals to put out more cortisol in order to raise the blood sugar back to its normal level. This will eventually put an excessive burden onto the already fatigued adrenal gland if carried on year after year.

9. Diet

A poor or unfitting diet is one of the key and leading causes of adrenal fatigue. Without a diet that is bio-chemically and metabolically compatible with the needs of a damaged adrenal gland, complete recovery is simply not possible.

Sugar

Glucose is a simple sugar found in food. It is an essential nutrient that provides energy for the proper functioning of the body cells. After meals, food is digested in the stomach and is broken down into glucose and other nutrients. The glucose is absorbed by the intestinal cells, carried by the bloodstream to cells throughout the body. However, glucose cannot enter the cells alone. It needs assistance from insulin in order to penetrate the cell walls. Insulin therefore acts as a regulator of glucose transport and metabolism in the body.

Insulin is called the "hunger hormone". As the blood sugar level increases after a meal, the corresponding insulin level rises with the eventual lowering of the blood sugar level and glucose is transported from the blood into the cell for energy. As energy is produced by the cell, blood glucose level slowly is lowered, the insulin release from the pancreas is turned off. As energy continues to be generated, the blood sugar level continues to drop. When it drops below a certain level, hunger is felt. This often occurs a few hours after the meal. This drop in blood sugar triggers the adrenals to make more cortisol. The cortisol increases the blood sugar by converting protein and fat into its component parts. With this, the blood sugar rises to provide a continuous supply of energy for our use between meals. Cortisol therefore works hand in hand with insulin to provide a steady blood sugar level 24 hours a day and keep blood glucose levels in a tightly controlled range.

When the adrenal gland is in a state, the amount of cortisol production drops below the normal level, and the amount of sugar available to the cells is reduced. With less sugar, less energy is available to the body, and fatigue is experienced. **As the sugar level drops below a critical point, dizziness and light-headedness can be experienced. These are common symptoms of low blood sugar (also called hypoglycaemia). Low blood sugar is most likely experienced between meals at 10am-12pm, as well as 3-4pm.**

To make things worse, the body's automatic response when more sugar is needed during a stress response is to make more insulin in an attempt to move the sugar into the cell from the blood stream to create more energy. Insulin opens up the cell membrane to push the glucose in, resulting in further reduction in blood glucose. This worsens the already existing hypoglycaemic state.

Those with adrenal fatigue often report symptoms such as dizziness and weakness, as the blood sugar level drops below a comfortable level for the body to function normally. To overcome this, the quick fix solution is to take food that is high in refined sugar such as donut or sweets, or drinks that is stimulatory to get

the adrenal to put out more cortisol, such as coffee or cola drinks. This gives the person a boost of energy. However, this hypoglycaemic symptom relief only lasts for about 1-2 hours. Inevitably, it is followed by a crash to an even lower blood level. Those suffering from adrenal fatigue are constantly on a roller coaster ride in terms of their blood sugar level throughout the day. The sugar level tends to increase after each quick fix, but drops after a few hours. By the end of the day, the body is totally exhausted.

A diet that maintains a constant sugar level in the blood is a critical consideration in adrenal fatigue recovery. This can be done by taking a variety of **low-glycemic index food** that releases sugar slowly to sustain the body during and between meals. Starchy carbohydrates that are converted quickly into glucose (such as pasta and bread) should be limited. Soda drinks should be totally avoided.

Salt

The amount of salt in the body is highly dependent and regulated by a chemical called aldosterone. This chemical is manufactured in the adrenal cortex under the direction of another hormone called ACTH (adrenocorticotropic hormone). ACTH is produced by the anterior pituitary gland. ACTH stimulates the adrenal cortex to secrete a wide variety of hormones including aldosterone as well as cortisol. Like cortisol, aldosterone follows a diurnal pattern of secretion, peaking at 8 a.m. and at its lowest between 12-4am. Aldosterone is a very specific compound that is responsible to maintain the concentration of sodium and potassium in the cell as well as outside the cell. This in turn has a direct effect on the amount of fluid in the body. Aldosterone therefore plays a significant role in regulation of blood pressure.

It is important to note that in our body, sodium and water goes hand in hand. Where sodium goes, water follows. **As the concentration of aldosterone rises in the body, the concentration of sodium and water rises, more fluid is retained in the body, and blood pressure rises. Conversely, when the level of aldosterone lowers, the amount of sodium and water in the body is reduced. The blood pressure goes down.**

Unlike cortisol, aldosterone does not have its own negative feedback loop when there are excessive amounts. If the aldosterone level is too high, aldosterone receptor sites will be down regulated and its sensitivity to aldosterone is reduced. In the early phases of adrenal fatigue, the amount of cortisol and aldosterone increases in our body due to the ACTH stimulatory effect from stress. As a result, the sodium and water is retained in the body with a feeling of bloated. The baro-receptors (receptors that are sensitive to pressure) of the blood vessels are triggered and blood vessels goes into a relaxation mode automatically and this is regulated by the autonomic nervous system. This auto-regulation helps to maintain a stable blood pressure at a time when the total fluid volume increases due to high level of aldosterone triggered by stress. With stress, the adrenal glands also secrete another hormone called epinephrine. This hormone constricts the blood vessels and increases blood pressure in order to ensure that our brain have adequate blood flow and oxygen to help us deal with impending danger. The sum reaction of aldosterone, epinephrine, and the autonomic relaxation response are some of the key factors that ultimately decide the final blood pressure at any point in time. **During the early stages of adrenal fatigue, the resulting blood pressure is often normal if all bodily function is well balanced. If the body is unable to overcome the aldosterone and epinephrine response, then the blood pressure is elevated. It is common to find many under stress experiences increase in blood pressure.**

As adrenal fatigue progresses to more advance stages, the amount of aldosterone production reduces. Sodium and water retention is compromised. As the fluid volume is reduced, low blood pressure ensues. Cells get dehydrated and become sodium deficient. Hydration of a person in adrenal fatigue should take about 24-48 hrs or more. Fluid with adequate electrolytes should be administered 2-4 times a day in intermittent dosages. Coffee, alcohol, and tea (with the exception of herbal tea) should be avoided.

Most with advanced adrenal fatigue reports a low blood pressure as well as a salt craving. The low blood pressure is due to the reduced fluid in the body. Salt craving is because the body is in a absolute deficiency of sodium. Both are due to the lack of aldosterone. In order to compensate for this, potassium is leaked out of the cells so that the sodium to potassium ratio remains constant. The loss of potassium is less than that of sodium, and as a result the potassium to sodium ratio is increased. This imbalance causes another set of problems.

Those suffering from adrenal often have a low body fluid volume accompanied by a salt craving due to absolute deficiency in sodium as well as a normal to high potassium level. While lost fluids should be replaced, it has to

be done carefully and slowly. **When the fluid is replaced too quickly without adequate sodium, the amount of sodium in the body may be diluted, resulting in an even lower sodium level. This is called dilutional hyponatremia.** Symptoms of low sodium include non-specific symptoms confusion, lethargy, nauseated, headache, seizure, weakness, restlessness. Adrenal fatigue along with low sodium leads to a clinical picture that is very challenging to all but the most experienced clinician.

Those in this state may find themselves visiting the Emergency Room for the many of these disturbing symptoms only to be told that all is normal after extensive workup. Electrolytes may actually be within normal range and symptoms persist among those who are severely decompensated and in a highly sensitive state consistent with advanced adrenal fatigue. Some may need diuretics to reduce fluid load while sodium load is being replaced. Symptoms may take some time to resolve.

Commercially available electrolyte replacement drinks such as Gatorade are designed for people who have normal adrenal and excessive loss of potassium during exercise. These drinks are designed to be high in potassium and low in sodium. They can be taken in as fluid replacement if adrenal fatigue is very mild. Sufferers of advanced adrenal fatigue usually have a low cortisol and sodium level. They should take filtered drinking water with ½ to one teaspoon of salt on a regular basis, especially in the morning upon awakening. If blood pressure increases, or signs of edema occur and nausea develops, stop the salt and report to a qualified health practitioner.

Only a small number of people with adrenal fatigue have concurrent high blood pressure. Those that fall into this category should check their blood pressure carefully during fluid replacement.

Sea salt is better than table salt in that it contains additional trace minerals as well. A good fluid cocktail for adrenal fatigue suffers is vegetable juice diluted with water and sprinkled with sea salt and kelp powder. Kelp contains about 90 mg of potassium and over 200 mg of sodium per serving and is easily absorbed.

Carbohydrate, Protein and Fats

It is important for adrenal fatigue patients to balance the amount of protein, fat, and well as carbohydrates. As compared to a normal person, the adrenal fatigue person has an immediate need for sugar when hunger strikes. At the same time, they also need good protein as well as good fat to have sustained energy until the next meal comes.

The primary diet should be high in raw food and that is low in glycemic index. Fruit juices should be avoided. Whole fruits should be limited, especially melons, which are high in sugar and causes sugar spikes soon after food enters the body. Good quality protein from meat, fish, and eggs are recommended. These provide a steady source of energy to carry the body through between meals.

Vegetarians who have adrenal fatigue have a much higher challenge. Legumes (beans) must be eaten with whole grains, seeds, or nuts to make a complete protein. It is important for vegetarians to add eggs, miso, as well as combining beans, seeds, and nuts with a small amount of whole grain. About 50-60% of the diet should consist of raw food. 6-8 servings of a wide variety of vegetables should be included.

Seeds and nuts are critical elements and sources of fatty acids that the adrenal glands need in order to manufacture cholesterol, a precursor to all adrenal steroid hormones. The key is to take nuts and seeds that are raw and free of rancid oils. Oils that are rancid make the symptoms of adrenal fatigue worse and should be avoided at all cost. Raw nuts should be taken on a liberal basis and should be soaked overnight in water. Nuts such as cashews, almonds, brazil, pecans, walnuts, and chestnuts are excellent. Peanuts should be avoided. Olive oil should be used for light cooking. The cooking heat should be low to moderate. Use coconut oil and butter for any high heat or deep-frying.

Vegetables high in sodium include kelp, black olives, red hot peppers, spinach, zucchini, celery, and Swiss chard. Fruits should only be taken in moderation. If you feel worse after food consumption, that is the body's way of telling you that you are on the wrong track. Organic fruits such as papaya, mango, apples, grapes, and cherry are recommended. Bananas, dates, figs, raisins, and grapefruit are high in potassium and should be limited.

Many people with adrenal fatigue also have a lower level of hydrochloric acid (HCl), which is necessary to break down the protein. Symptoms of this problem include gas, bloating, and heaviness in the stomach after eating a meal containing protein. In such case, the use of digestive enzymes, probiotics, as well as HCl replacement is recommended. [Garden Essence Plant Enzymes](#), [Probiotic 11](#) and [Protein Digestive Aid](#) are ideal supplements.

Dietary Tips:

1. **Always eat breakfast, and do it before 10am.** The body's glycogen supply needs to be replenished after the previous evening. Try to eat your lunch before noon followed by a nutritious snack between 2 and 3. The evening meal should be taken before 6pm. Just before bedtime, a couple of bites of high quality snacks are recommended.
2. **Combine small amount of whole grains with generous portion of protein and fat at every meal and snack except at bedtime.** This will ensure sustained energy is available at and between meals.
3. **Eat 20-25% whole grain, 30-40% above the ground vegetables (50% of which should be raw), 10-15% beans, nuts, and seeds, 10-20% animal food, 10-15% good fat, and 5-10% whole fruits (except banana and fruits in the melon family).**
4. **Whole fruits are permitted in lunch and dinner except banana, figs and those in the melon family.**
5. **Sprinkle sea salt liberally** to food to pleasant taste provided that blood pressure is normal. Food that is high in potassium such as bananas and dried figs can make the adrenals worse and should be avoided.
6. **Start each morning with a full glass of water and half a teaspoon to one teaspoon of sea salt.** The typical breakfast of fruits and yogurt will only worsen the adrenal fatigue sufferer. In fact, those with adrenal fatigue usually experience an increase in shakiness after a breakfast high in fruits. A good breakfast would be one that is high in protein and fats such as eggs and raw nuts. A very small amount of grains is acceptable.
7. Eat 5-6 frequent small meals instead of 3 large meals
8. **Take small amount of healthy snacks high in protein and fat such as cottage cheese or nuts before sleep if there is a tendency to wake up in the middle of the night.**
9. **Take small amount of carbohydrate such as whole grain bread before sleep if there is a difficulty to fall asleep.**

Sample Dietary Plan of 2000 calorie a day:

20% whole grain = 400 calories = 2 slices of whole wheat bread, 1 cup of brown rice, and half cup of oat meal.

30% vegetables = 600 calories = 3 cups salad, 2 cups green leafy vegetables, 2 cups mixed vegetables.

15% nuts and beans = 300 calories = legumes, 3 tablespoon of nuts and seeds.

15% fat = 300 calories = 2 tablespoon olive oil.

10% animal food = 200 calories = 2.5 oz meat (including chicken, or fish).

10% whole fruits = 200 calories = 2.5 medium whole fruit such as apple.

ADRENAL FATIGUE DIET

by Michael Lam, MD, MPH, ABAAM, CNC and Dorine Tan, RD, MPH, ABAHP

Goals

- 1) Eat before 10:00 a.m.

2) Eat frequent, small meals: 6-8 am (breakfast), 12 noon (lunch), Snacks - 10am, 3pm and Bedtime	
3) Eat 30-40% whole grains, 30-40% Vegetables (50% should be raw), 10-15% Beans, seeds & nuts, 10-20% animal foods, 5-10% fruits	
Avoid	
Banana, dried figs, raisins, dates, oranges, grapefruit	High in potassium - make adrenal fatigue worse
Fruit and juices in the morning	High in potassium and fructose.
Refined flour products: pasta, white rice, bread, pastry, baked goods	Drop blood sugar fast, robbed of nutrients
Honey, sugar, syrups, soft drinks	Drop blood sugar too fast in one hour
Dried fruits, fruit juices	Most detrimental food early in the day - drop blood sugar too fast
coffee, tea, black tea, hot chocolate, alcohol, colas, chocolates	Drop blood sugar too fast in one hour
Avoid Foods you are Addicted to or Allergic or Sensitive to	These food cause more stress on your body.
Avoid fruits for breakfast	Raise and drop blood sugar fast
Avoid rushed and hectic meals	Create more stress for your body.
Avoid deep-frying and browning; hydrogenated oils	Transfat
Most Beneficial	
Eat before 10am	Replenish waning glycogen supply
Eat frequent small meals	Coast through low energy time
Bedtime Snack (use soaked raw nuts)	Help to have more peaceful sleep.
Combine fat, protein and whole grains at every meal and snack.	Provide a steady source of energy over a longer period of time
Mix 1-2 tbsp essential oils into grains, veg, and meats daily	
Good quality protein (meat, fish, fowl, eggs, dairy), legumes)	Provide good protein and fats
Take digestive enzymes and HCL with meals	Help to properly break down protein and high fiber foods in the stomach
Eat 6-8 servings of a wide variety of bright coloured vegetables	You will not gain weight; provide vitamins, minerals, phytochemicals, antioxidants which are crucial for optimal health.
Sprouts	High quality concentrated nutrients
Sea vegetables	Rich in trace minerals, good quality vegetable protein, easily digested.
Monounsaturated fats	used for low heat cooking, put a little water in the pan before the oil to keep the oil from getting too hot
Fresh and Raw nuts & seeds (soaked in water) - store in freezer	Good source of essential fatty acids
Acceptable - take in moderation	
Whole unrefined grains	provide sustained energy and nutrients Caution: take it easy as breakfast food. Some people may need to avoid for breakfast.
Limited intake of fruits: Papaya, mango, plums, pears, kiwi, apples, few grapes, cherries	
Polyunsaturated fats (corn, safflower, sunflower, peanut oil)	Never cook with this oil, add after the food is cooked. Provide essential fatty acids

TIPS FOR HEALTHY ADRENAL GLANDS

NOTE: Initially, you may want to take an herbal glandular remedy to initiate healing but the following lifestyle recommendations are important for overall health. [Adrenal Support](#) is an adrenal glandular remedy, whereas [Master G](#) helps to balance overall hormones and blood sugar levels. [Women's Formula](#) or [Men's Formula](#) are also great herbal remedies to “kick start the healing” process.

- Sleep by 10 p.m.
- Sleep in until 9:00 a.m., if possible
- Do the things that you like because it will stimulate “positive emotions”
- Avoid coffee or other caffeine containing beverages
- Eat early
- Have a glass of water in the morning with 1/2 to 1 teaspoon of seasalt
- Supplement occasionally with trace minerals such as [Chinese Mineral-Chi Tonic](#)
- Avoid grains such as bread
- Avoid starchy foods such as potato
- Avoid trans-fat such as French fries
- Laugh several times a day
- Take [Vitamin C](#), [Magnesium](#), and [Vitamin E with Selenium](#) on a regular basis
- Eat foods high in B vitamins or supplement with a high quality plant based source of [B-Complex](#). Make sure to supplement with [Pantothenic Acid](#) (B5) and [Vitamin B6](#) on a regular basis as well.
- Take herbs that increase progesterone production naturally, such as [Wild Yam & Chaste Tree](#) or use [Progesterone Cream](#)
- Avoid getting over-tired or take naps
- Avoid large amounts of high sugar fruits
- Never skip breakfast
- Read our “[Top 20 List](#)” for additional lifestyle suggestions

Adrenal Fatigue Recovery

Most adrenal fatigue is mild, lasting a few days or weeks, with full recovery. A minority of people will find recovery a challenge. Their conditions last longer than usual. They improve, but never fully recover. Still, a smaller number slowly decompensate and the condition worsens with time.

Normal adrenal fatigue recovery usually takes only a few weeks or months. **The normal recovery curve when plotted graphically should resemble a series of stair-steps going up, with a pause between each step. Those failing to recover usually have their recovery curve looking like a series of stair-steps going down, or series of waterfall, with a lower low after each crash.**

Frequent onset of adrenal fatigue symptoms with ever increasing severity and duration is often a hallmark of adrenal fatigue recovery failure. While the body has a built in a system of self repair, this mechanism is often not properly taken advantage of fully in the recovery process. There are multiple reasons for this failure. Here a few common reasons why:

1. **Improper use of nutritional supplements:** Long term use of stimulatory nutrients can lead to addiction and withdrawals. Applying the same dose of nutrients throughout the recovery process without careful consideration of this cyclical recovery process can lead to devastating results. The lack of attention to blending various forms of one nutrient leads to less than optimal levels required for recovery. Failure to employ the right delivery system of selected nutrient leads to waste and inadequate cellular concentration to affect recovery. One could be overdosing and putting excessive loads on the adrenal at a time when it does not need as much, or under-dosing and thus depriving the adrenal of nutrients when it needs it the most if the dosage and delivery system is not titrate with the body's need each step along the way. Sometimes, fewer nutrients are needed in an up cycle, while more is needed in the down cycle. Other times, it is just the reverse. **Applying a static approach to nutritional therapy often fails and in fact worsens the condition. It is important to match the dosage to the state of recovery for maximum effectiveness.**
2. **Inexperienced health care provider and operator mal-function for those who are attempting to self-navigate:** Most conventional physicians are not well informed or trained on adrenal fatigue because it is not a recognized condition in the main stream medical community. The lack of medical education and research results in tremendous misinformation and confusion among the medical professionals and lay communities alike. Those with beginning and mild adrenal fatigue may do well with rest, removal of stressor ,and gentle nutrients on a self-guided basis. If recovery fails within a short time, it is imperative to seek professional help because the natural progression of this condition is decomposition as the body ages. **Advance stages adrenal fatigue is a condition that is complex and is best left to those highly specialized in this field. Inappropriate therapy often backfires and worsens the condition**

over time. Most on a self-guided recovery program (along with many treated by conventional doctors) tend to waste too much time (often years) on their own only to get worse.

- 3. Excessive use of prescription drugs and medications:** Excessive use of prescription drugs often makes adrenal fatigue worse, especially when anti-depressants, thyroid replacements, hormone replacements are dispensed without careful attention to the state of adrenal condition. Those who are on thyroid medication should especially be on the alert if an ever-larger dose of thyroid medication is needed to keep the condition stable.

CONCLUSION

Adrenal fatigue is a decrease in the adrenal glands ability to carry out its normal function. The chief symptoms are fatigue, excitability, or depression.

Adrenal fatigue is commonly cause by chronic stress from any source (including emotional, physical, mental, or environmental) that exceeds the body's capacity to adjust appropriately to the demands placed on it by the stress. It is a condition that afflicts children as well as adults. It can be diagnosed by properly laboratory test, if only the physician pay more attention.

Adrenal glands can be restored to optimum health naturally by adhering to healthy living principals. Proper rest, together with specific nutritionals, proper diet and removal of stressors are key components to adrenal fatigue recovery.

The road to adrenal recovery is not a linear or straightforward path because of the complexity of our internal hormonal and stress-regulation system.

Most people who suffer from adrenal fatigue also have multiple endocrine imbalances including sub-clinical hypothyroidism, insulin resistance, and estrogen dominance. These need to be optimized as well. Adrenal recovery is a process akin to running a marathon. The process is long, but it can be done easily and painlessly, one step at a time. Most will find some improvement in a matter of weeks, depending on the degree of pre-existing damage and the clinical skills of the health professional. Because the amount of hormonal balancing is intricate and is highly sensitive, the process take anywhere from 3 months to 3 years under the best of hands. It is a long marathon, and recovery should not be expected in a matter of weeks. Frustration and disappointments are common and normal. Patience is key. During the recovery process, most, if not all, will go through a roller coaster type ride with advances and setbacks.

The use of the proper amount of nutritional supplement can certainly speed up the recovery process, if done properly. It is critically important to note that while there are many nutrients that can help the adrenal recover, only a few are normally needed at any point in time. **Nutrients, if not dosed properly, can become toxic and make the adrenal fatigue worse. A shot gun approach seldom works and can in fact backfires if the adrenal is not able to take in the nutrients at the right rate, time, and dose.**

Take it one step at a time under professional guidance is best to ensure that the right step is taken at the right time. This is especially true for advance case. Laboratory test can be helpful, but is not critical in most cases. The key is a knowledgeable clinician who takes the time to understand your body and its signal and cries for help. A total nutritional and lifestyle approach that helps the adrenal gland to normalize itself, with ongoing adjustments in terms of nutritional supplementation to help the adrenal during this recovery is the key.

Reference website: http://www.lammd.com/articles/adrenal_fatigue.asp?page=1