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About the Authors

Michael Lam, M.D., M.P.H., A.B.A.A.M., is a western trained physician specializing in nutritional and anti-aging medicine. Dr. Lam received his Bachelor of Science degree from Oregon State University, and his Doctor of Medicine degree from the Loma Linda University School of Medicine in California. He also holds a Master’s degree in Public Health. He is board certified by the American Board of Anti-Aging Medicine where he has also served as a board examiner. Dr. Lam is a pioneer in using nontoxic, natural compounds to promote the healing of many age-related degenerative conditions. He utilizes optimum blends of nutritional supplementation that manipulate food, vitamins, natural hormones, herbs, enzymes, and minerals into specific protocols to rejuvenate cellular function.

Dr. Lam was first to coin the term, ovarian-adrenal-thyroid (OAT) hormone axis, and to describe its imbalances. He was first to scientifically tie in Adrenal Fatigue Syndrome (AFS) as part of the overall neuroendocrine stress response continuum of the body. He systematized the clinical significance and coined the various phases of Adrenal Exhaustion. He has written four books: The Five Proven Secrets to Longevity, Beating Cancer with Natural Medicine, How to Stay Young and Live Longer, and Estrogen Dominance. In 2001, Dr. Lam established www.DrLam.com as a free, educational website on evidence-based alternative medicine for the public and for health professionals. It featured the world’s most comprehensive library on AFS. Provided free as a public service, he has answered countless questions through the website on alternative health and AFS. His personal, telephone-based nutritional coaching services have enabled many around the world to regain control of their health using natural therapies.

Dorine Lam, R.D., M.S., M.P.H., is a registered dietitian and holistic clinical nutritionist specializing in Adrenal Fatigue Syndrome and natural hormonal balancing. She received her Bachelor of Science degree in Dietetics, holds a Master’s Degree in Public Health in Nutrition, and a Master of Science degree in Nutrition from Loma Linda University, in Loma Linda, California. She is also a board-certified, Anti-Aging Health Practitioner by the American Academy of Anti-Aging Medicine. She coauthored with Michael Lam, M.D., the book Estrogen Dominance and numerous articles on Adrenal Fatigue Syndrome. Her personal research and writing focuses on the metabolic aspect of Adrenal Fatigue Syndrome. She is married to Michael Lam and is an integral part of the telephone-based nutritional coaching team helping people overcome Adrenal Fatigue Syndrome.

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Fatigue and lethargy are two of the most common complaints doctors hear from their adult patients, both of which are symptoms of a silent epidemic condition known as Adrenal Fatigue Syndrome (AFS). This condition is as old as humankind, but its incidence has skyrocketed as our society and our lifestyles have become increasingly complex and high-pressured.

From a sufferer’s point of view, Adrenal Fatigue Syndrome is confusing and frustrating. We can see the everyday consequences of Adrenal Fatigue Syndrome in the following statements:

- I’m tired all the time—I manage to keep going on my job, but I drink coffee every few hours to get through.
- I used to merely gripe and complain about feeling tired, but now the fatigue is so overwhelming and debilitating, I’m underperforming on my job.
- I’m anxious and fearful much of the time.
- I seem to catch every cold or flu that comes around.
- My joints ache, and my doctor said I probably have arthritis, even though I just turned 40.
- I’m depressed and can’t think straight—I feel like I walk around with brain fog.
- I’ve tried every diet in the book, but I can’t lose weight.
- I wake up at 3:00 AM and toss and turn for hours and cannot fall asleep again.
- I used to have great energy, but now a short walk wears me out.
These statements personalize some of the typical—and persistent—signs and symptoms of Adrenal Fatigue Syndrome. You might have described these same things to your doctor, or you may have noted these changes in your health or know someone who has these complaints, but you don’t know what to make of them. If you’re over age forty-five or fifty, you might even be told to attribute your symptoms to “normal” aging!

Below, you’ll find an expanded list of the signs and symptoms of Adrenal Fatigue Syndrome. Not surprisingly, many of these symptoms are also related to other conditions, and they match the statements listed above:

• Often feels tired between 9:00 and 10:00 PM, but resists going to bed
• Difficulty getting out of bed in the morning
• Cravings for salty, fatty, and high protein food such as meat and cheese
• For women, increased symptoms of PMS and irregular menstrual bleeding, with days of heavy flow that stops (or nearly stops) on day 4, only to resume on days 5 or 6 of the menstrual cycle
• Pain in the upper back or neck with no apparent reason
• Tendency to feel better on vacation and when stress is relieved
• Food and or inhalant (air borne) allergies
• Dry and thin skin
• Hypoglycemia but blood sugar is normal
• Low body temperature despite thyroid medication

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As you can see, Adrenal Fatigue Syndrome has a broad spectrum of symptoms, many of which seem nonspecific, and, therefore, are often reframed as psychological in origin, such as anxiety or depression. Sometimes patients are told that these symptoms are “nothing that some rest won’t cure.” However, it is clear that Adrenal Fatigue Syndrome is not that simple. Research shows that AFS at its core represents the body’s neuroendocrine stress response when under threat.

Do not confuse AFS with Addison’s disease.

Addison’s disease is often caused by an autoimmune dysfunction, whereas stress and a host of other factors are the primary culprits of Adrenal Fatigue Syndrome. The symptoms of Addison’s disease include low energy, joint and abdominal pain, weight loss, diarrhea, fever, and electrolyte imbalances. Some AFS sufferers report these symptoms too, but they are usually much less intense.

Both lead to low cortisol output in the adrenal glands, though those with AFS can be symptomatic despite the fact that laboratory tests are usually normal. Currently, conventional medicine recognizes only Addison’s disease as a legitimate disease of low adrenal function. If, for example, you ask your doctor if your symptoms could point to Adrenal Fatigue Syndrome, you may learn that he or she has not heard of AFS or may deny its existence.

Adrenal Fatigue Syndrome (AFS) consists of four broad and overlapping clinical stages, from mild to severe. Stages 1 (Alarm
Reaction) and 2 (Resistance Response) are generally mild. Some fatigue is present, but not debilitating. Few are alerted and seek professional help. By the time Stage 3 (Adrenal Exhaustion) arrives, most have seen their physician for lack of energy and are usually told all is well after an extensive workup. Fatigue in Stage 4 (Adrenal Failure) is severe and most sufferers are bedridden.
Chapter 1

Early Adrenal Fatigue Syndrome: Stages 1 and 2

Without question, Adrenal Fatigue Syndrome, with its myriad manifestations, is both confusing and perplexing, a situation made worse by the lack of consistency in the way we refer to the condition. As we’ve said, for our purposes in this book we use Adrenal Fatigue Syndrome as the overall name. Stages 3 and 4 refer to advanced AFS, and we call Stage 3 and its phases, Adrenal Exhaustion. Stage 4 is referred to as Adrenal Failure. To avoid confusion, except for providing the basic definitions, we use the term Adrenal Exhaustion only when referring to Stage 3.

Bear in mind that the stages and phases of AFS overlap greatly. The boundaries are indistinct. They are presented here to help us clinically get a feel for the broad perspective as it is very easy to be overwhelmed and miss the big picture. These definitions should not be used as tools for diagnosis.

Stage 1: Alarm Reaction

In this stage, which can last days, months, years, and even decades, the body periodically is alarmed by stressors and mounts an aggressive anti-stress response to reduce stress levels. (The stressors could be physical or psychological, or, typically, a combination of stressors that trigger the alarm reaction.) Common examples include events of daily life we often take for granted as normal, such as change of career, physical relocation, excessive exercise, and skipping meals on a regular basis. Some physicians refer to this as the “early fatigue” stage. In this state, brain norepinephrine output is increased, leading to a state of arousal and alertness. We use this alertness to keep us awake when it is time to go to sleep. We also see increased ACTH (a hormone produced by the anterior lobe of the pituitary gland), which stimulates the adrenal cortex into making more cortisol, DHEA, pregnenolone, and aldosterone, among others. These hormones’ collective physiological actions result in a second wind to keep us going physically and emotionally when it is time to rest.

Individuals do not report symptoms at this stage, and their daily activities are unaffected, although they may note feeling tired. In order to maintain or boost their
energy level, many rely on coffee or other caffeinated drinks to start their day. They may find they need increasing amounts of caffeine to feel revved up for the day. Unfortunately, the social acceptance of addiction to coffee gives us the excuse to carry a coffee cup around in the office. Some even consider this type of external stimulant normal. In fact, not to be part of the coffee culture can be considered unsociable.

Stage 1 is a common occurrence. Because the body’s stress response is effective and no damage is perceived, no attention is paid to the fine detail of how the body is already drawing on its nutritional reserves at this stage. Almost all adults at one point or another have multiple such experiences. Many already have their first experience in their teenage years on retrospect. As long as the stress lessens and the normal rhythm of daily life returns, most people in this stage recover with extra rest. Most individuals pass in and out of Stage 1 without realizing they have experienced even a brief episode of adrenal fatigue. Routine blood laboratory tests are normal. Saliva cortisol testing is generally normal as well, but the morning cortisol usually starts trending up as Stage 1 progresses. In the absence of any outward symptoms other than occasional fatigue, this lack of energy is compensated by the socially acceptable use of stimuli to boost energy. Unfortunately, based on the premise that stimulating energy with coffee and sweets is harmless, for the most part, our society has inadvertently condoned this approach. In reality, suppressing symptoms only worsens the progression of those with Stage 1 AFS over time.

Stage 2: Resistance Response

Greater exposure to life stress, or psychological vulnerability to stress, increases cortisol demand. The neuroendocrine response is to put the HPA axis on overdrive to increase output of cortisol and other anti-stress hormones. Socioeconomic and psychosocial handicaps are probably central inducers of hyperactivity of the HPA axis. Alcohol, smoking, and traits of psychiatric disease may also be involved. The HPA axis starts to be overtaxed but at this stage is not yet dysfunctional.

Cortisol is the primary anti-stress hormone systemically. Its release from the adrenal glands helps to provide for and regulate our fuel requirement during stress. At the same time, it helps reduce inflammation and calm the nerves during highly stressful events. It serves as both an acceleration and braking mechanism at the same time via different pathways, ensuring our ability to successfully deal with stress and yet have normal physiological functioning. This is a temporary fix, however. One cannot drive a car successfully without damage over time if one foot is applied on the gas pedal, and the other one is applied on the brakes at the same time, though in varying degrees.
Cortisol and Metabolic Dysregulation

A consistently high cortisol level in the body has many unintended consequences. Studies have shown that rising cortisol is associated with overeating, a common finding in those with Stage 2 AFS. Cortisol stimulates the appetite and provokes cravings for sugar. It may explain why some people tend to eat more when they feel stress, especially craving sweets such as chocolate, which can lead to weight gain. Cortisol directly influences food intake by binding to receptors in the brain, thus regulating other chemicals released during stress.

Studies have shown that premenopausal women who secrete more cortisol during stress also choose to consume more foods high in sugar and fat. The craving for donuts and other sugary food and drinks in times of stress could be an indication of a body in Stage 2 AFS. Let us be clear that not all people under stress overeat, and some people experience loss of appetite instead. We still don’t fully understand the precise mechanism of this, and many factors are likely involved.

Chronically high cortisol (but not high enough to warrant a diagnosis of Cushing’s disease) has negative consequences. While cortisol has been shown to promote overeating, it also blunts the normal rise in the metabolic rate that occurs after a meal. When accompanied with excessive caloric intake, stress induced obesity is a risk. This kind of obesity is particularly harmful because the fat tends to accumulate centrally around the abdomen. Some call this “sick fat” or “toxic fat.” This is also called adiposopathy and results in pathophysiologic endocrine and immune responses that promote metabolic disease. This process affects men and women differently. Studies have shown that lean women who are vulnerable to the effects of stress are more likely to have abdominal fat as well as a higher level of cortisol in their body. Lean women with abdominal fat tend to have exaggerated responses to cortisol, more negative moods, and higher levels of life stress. In other words, in lean women central fat may indicate an underlying sensitivity to stress and greater vulnerability to AFS.

Central Obesity

When you eat more than you need, calories not burned must be diverted. Adipose (fat) tissue is specialized tissue that functions as the major storage site for fats. When you consume more daily calories than you burn off, especially a diet high in carbohydrates, you usually end up with excess triglycerides, free fatty acid, and body fat. An abnormally high triglyceride level in a healthy person may sometimes be considered an early warning sign and an indirect surrogate marker of high cortisol in a setting of stress and AFS.
When deposited in the liver, fat can lead to fatty liver and cysts. This may take years to develop. It comes as no surprise that high cortisol promotes fatty liver. Those afflicted with Cushing’s syndrome, a condition where the cortisol output is constantly raised, usually have high blood sugar and frequently develop fatty liver. Fatty liver increases the risk of metabolic diseases.

In addition, cortisol regulates the overall energy of the body by selecting and delivering the right type and amount of fuel needed to meet physiological demands during times of stress. This is accomplished by tapping into the body’s fat stores and moving fat from one location to another, or when needed, delivering it to hungry tissues such as working muscle.

In the peripheral tissue, cortisol concentrations are controlled by a specific enzyme called 11-beta-steroid dehydrogenase, located in the adipose tissues, which converts cortisol to inactive cortisone. Cortisol has much greater glucocorticoid activity than cortisone; thus, cortisone can be considered an inactive metabolite of cortisol. However, this enzyme can catalyze the reverse reaction as well. Therefore, cortisone is also the inactive precursor molecule of the active hormone cortisol. Human visceral fat cells, such as those surrounding the abdomen, have more of these enzymes as compared to subcutaneous (under the skin) fat cells. In addition, deep abdominal fat has greater blood flow and four times more cortisol receptors compared to subcutaneous fat. This may also increase cortisol’s fat accumulating and fat cell size enlarging effect. Together, they may increase the risk of central obesity. Along with a host of other factors including insulin resistance, they contribute to the “muffin top” look that many carry around with them in their abdominal area. These individuals generally have a high waist-to-hip ratio, which identifies visceral obesity.

Central obesity is the hallmark of, and a required finding for, diagnosis of metabolic syndrome. This syndrome is an epidemic afflicting many adults in developed countries. Metabolic syndrome is a powerful predictor for disease. The combination of fatty liver, obesity, diabetes, and hypertension is the forerunning and primary cause of life threatening vascular events such as myocardial infarction and stroke. It is clear that disturbances in cortisol and HPA axis function are involved in central or abdominal obesity. Cushing’s syndrome and subclinical Cushing’s disease (both of which are characterized by elevated cortisol output) are associated with increased waist/hip ratio, risk of insulin resistance, high amounts of fats in the blood (hyperlipidemia), and cardiovascular disease risk.

Cholesterol is a fat and a key raw material that your adrenal glands need to make steroidal hormones such as cortisol. Cholesterol levels that are too high, however, can increase your chance of getting heart disease, stroke, and other problems. A rising
cortisol associated with this stage can produce similar signs of dysregulated lipid profile in the blood (dyslipidemia), though they are often quite marginal and thus passed over as non-AFS related.

**Cortisol and Dyslipidemia**

Using salivary cortisol measurements throughout the day, studies have shown that stress-related elevated cortisol secretion is often associated with dyslipidemia, as demonstrated by an abnormal blood lipid panel on a routine screening test.

Dyslipidemia is a risk factor for cardiovascular disease. Historically, this usually happens to those in their midlife years. However, we are seeing an alarming rise in the rate of secondary (acquired and not familial) dyslipidemia starting with many in their mid-twenties. Much of the blame of this abnormal lipid picture is placed on improper diet, alcohol, and lack of exercise, but stress as a root cause is often missed. Even if fatigue is absent, those with clinical signs of secondary dyslipidemia should be on alert for AFS, especially if there is a history of stress.

What is confusing is that for reasons we don’t yet know, not everyone with Stage 2 AFS has abnormal fat levels in the blood. In addition, not everyone with dyslipidemia has AFS. Clearly there is a complex neuroendocrine background to metabolic syndrome, where the mechanisms regulating the HPA axis play a central role. While clinical symptoms of gross HPA axis dysfunction will only surface later in Stage 3, early onset of an abnormal laboratory lipid profile may serve as an advance marker of internal metabolic dysregulation. Typically, the total cholesterol is normal or high, with normal or high LDL (bad cholesterol), normal or low normal HDL (good cholesterol), and high normal or high triglyceride level. Such a dyslipidemia, especially if accompanied by high or rising triglycerides over time in an otherwise normal and healthy person, may be a warning sign that one may already be in early AFS and not know it. Many are placed on lipid lowering medications rather routinely and often prematurely. Others are placed on vigorous exercise and low-fat diets. Stress as a possible root cause is often under-investigated and not taken seriously.

**Blood Pressure and Exercise in Stage 2**

Blood pressure tends to be normal or borderline high at this stage. As this stage advances, aldosterone and central norepinephrine output rises. Aldosterone increases lead to sodium retention and thus increased fluid volume. The more fluid in the body, the higher the blood pressure if all else is equal. Separately, a systemic norepinephrine increase raises the blood pressure and heart rate. The bias is toward a higher than
normal blood pressure. Because most are still in good health and relatively young at this stage, their vascular wall-support structure tends to be quite pliable. The automatic vascular relaxation response triggered by baroreceptors that are activated when blood volume and pressure rises, results in a compensatory reduction and, thus, normalization of blood pressure. Those who are older or unable to compensate may suffer from high blood pressure as a result. We will have much more to say about this in Chapter 7, *Stage 3A—Early System Dysfunction*.

While mild fatigue may be experienced from time to time under prolonged stress in this stage, a normal and active life continues. Exercise capacity is unrestricted. In fact, many report a sense of alertness and well-being after moderate aerobic exercise. During aerobic exercise, the body is manually put on alert as far as the neuroendocrine system is concerned. Norepinephrine and epinephrine output increase to help increase blood circulation and enhance oxygen delivery to the muscles and brain for optimum performance. Some are misled into thinking that such an approach is correct, and thus the more the better. They embark on an excessive exercise program almost as an addiction to combat fatigue brought on by stress.

Moderate exercise accompanied by proper rest and nutritional support is conducive to the overall healing process and recovery from Stage 2 AFS. Excessive aerobic exercise not accompanied by proper rest slowly drains the body of internal reserves, and can accelerate the decompensation over time.

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**Excessive exercise can be destructive, and many experience their first major adrenal crash after what appears to be a normal workout at the gym.**

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If the crash was severe, then even after rest and recovery they do not feel quite the same as before. Some fail to fully recover from that point on and quickly slide into advanced stages of AFS. Others are able to recover slowly, but unless exercise is reduced quickly and proper nutritional healing and rest instituted consistently, the likelihood of repeat crashing is high. We see that high-performance athletes are particularly vulnerable. They often crash and succumb after a heavy training session, as well as after a competitive event.

**Cellular Damage**

As you can see from the diagram below, cortisol output reaches its peak in this stage. After that, cortisol output starts to decline back to a normal level as Stage 2
progresses. ACTH remains high throughout. This process can play out over years if not decades. When measured through saliva testing, the morning, noon, or afternoon cortisol levels may be high, early on, in this stage, and tend to return to normal or low normal after peaking as this stage advances. Nighttime cortisol level is usually normal throughout, though for reasons not well understood, we do see high nighttime cortisol in some individuals. Figure 4. below shows how highly variable cortisol and DHEA production is as a function of Stage.

What makes this stage so dangerous is that much of the damage is subclinical and usually goes totally unnoticed. On the outside, one looks perfectly fine, but internal cellular damage is well under way.

Stage 2 often starts in the twenties or thirties and usually lasts for years into decades. Since, like Stage 1, it often goes undetected, it most often is evident only in retrospect. Intermittent fatigue, borderline or abnormal lipid panels, normal to borderline high blood pressure symptoms, and weight gain suggestive of reduced metabolism are treated as separate isolated problems, often with medications. The AFS picture is usually missed, especially early on. Most in this stage continue with their normal and active life on this track, thinking that all is well. Without considering AFS, they may be continually and unknowingly driving themselves into a path of slow destruction as cellular damage advances.
The Slow Death

Many in lifelong Stage 2 are unaware of the internal dysfunction caused by stress, but as aging sets in, borderline signs and symptoms may become more prevalent. By midlife, many are physically showing gross signs of central obesity with a “muffin top” belly or “spare tire” in the abdominal area, accompanied by lack of vitality and tolerance for exercise, hyperlipidemia (high cholesterol), dysglycemia (abnormal glucose level), mild but worsening food sensitivities, mild insomnia, and inability to lose weight despite strenuous exercise.

It is not uncommon to be taking a basket of prescription medications including those for persistent high blood pressure, the majority of which are classified as essential, another term for “unknown cause” in the medical world. Lipid lowering medications also are usually part of the regimen in order to normalize their dyslipidemia (generally high total cholesterol, with high LDL and low HDL), along with some type of sleep medication and possible sugar regulating medications.

Mislead by the normalization of blood pressure, blood sugar, and lipid profiles brought on by medications and confirmed by laboratory tests, many continue to live in the fast lane with its unrelenting stress. Ignoring Mother Nature’s warnings, they are content to have been rescued by modern medicine with what appear to be harmless prescription drugs. After all, their blood pressure and blood sugar are normal, and their cholesterol numbers are now under control. Little do they know that, over time, such a symptom-patching approach often leaves the body vulnerable to other potentially more serious dysfunctions.

Remember that dyslipidemia, high blood pressure, and sugar imbalances are all symptoms of internal dysregulation, though they are now labeled as diseases and treated as such. Many factors combine to lead to these symptoms. Stress is one often overlooked factor. The wakeup call often comes only after a massive heart attack or a paralyzing stroke, both of which can be permanently disabling or even fatal. Unfortunately, it is often too late to completely reverse AFS and recover after such physically catastrophic events.

It is important to remember that the absence of fatigue as the predominant symptom in Stage 2 does not mean that the body is not under stress. The body’s well equipped neuroendocrine compensatory response is simply working extra hard and has successfully overcome stressors. This results in a relatively normal state of energy flow. Therefore, most at this stage are mislead into thinking that all is well.

Having a healthy adrenal system is critical for overall well-being at any age. Whether it is to prevent onset of AFS, help the body fight infections, support recovery
from surgery, or reduce fatigue, those who are on alert for signs of early stages of AFS and take appropriate remedial action are practicing good preventive medicine.

Sadly, most people are ignorant of this stage. They, along with those who are constitutionally weak or low in nutritional reserve, have an increased chance of progressing to the advanced stages, which we shall cover beginning in the next chapter.

Key Points to Remember

• There are four stages of Adrenal Fatigue Syndrome, from mild to serious.

• Stage 1 is called the Alarm Reaction. Fatigue is very mild and transient. The body has ample adrenal reserve. Physiologically, cortisol output increases. Full recovery comes with a good night’s rest. Few are alert enough to know when this stage occurs and it becomes evident only in retrospect.

• Stage 2 is called Resistance Response. Fatigue becomes more bothersome and requires more rest than one night. A few days of vacation is often needed. Sugar fixes and an increased dependency on caffeinated drinks increases in order to overcome fatigue. Cortisol output peaks as demand continues from unrelenting stress. Clinical signs are few. We should always consider stress as a silent contributing factor to hypertension, dyslipidemia, and central obesity. Many stay in Stage 2 AFS throughout their adult life, unaware of internal damage.
Stages 3 and 4 are considered advanced stages of AFS, and for good reason. This is the major turning point where things can go bad quickly because the adrenal glands are exhausted. Those who have been only experiencing intermittent fatigue when stressed, characteristics of earlier stages, now start to face the uphill challenge of keeping up with their daily energy demand. Progressive increases in fatigue now mark their life. No longer are their daily activities unrestricted. For those who were healthy before, clinical symptoms start to surface and likely will get worse with time.

If not reversed, the ultimate fate awaits—adrenal failure.

Stage 3: Adrenal Exhaustion

Recall in Stage 2 that unrelenting stress increases cortisol output from the adrenal glands. After peaking, the cortisol level starts to drop. Despite rising ACTH production from the pituitary gland and ongoing HPA axis stimulation, the adrenals are no longer able to keep up with the body’s increased demand for cortisol production. Moderate to severe persistent fatigue is the norm as the body enters Stage 3, Adrenal Exhaustion. This stage is also called Neuroendocrine Exhaustion as the neuroendocrine system is now on full throttle, with eventual breakdown as this stage progresses. This stage may develop over a period of years as well, which is why lifestyle issues are so important in analyzing and discussing AFS.

As this stage progresses, total cortisol output drops below normal, and DHEA falls far below average. A twenty-four hour saliva cortisol test is likely to show a cortisol curve that has a tendency to flatten as AFS advances. In addition to the morning cortisol level being low, the nighttime cortisol level is usually reduced as well. The body’s nervous and endocrine systems progressively become more dysregulated as this stage advances. The HPA axis becomes dysfunctional and eventually burns out. The emergency compensatory stress response system, mediated by the autonomic
nervous system (ANS), starts to be put on overdrive. Most symptoms of advanced AFS, such as hypoglycemia, low blood pressure, and anxiety, start showing up here. Eventually, even the ANS system becomes dysfunctional, leading to Stage 4.

**Stage 4: Adrenal Failure**

Eventually, the adrenals and the neuroendocrine system become totally worn out and are defeated in their attempt to overcome stress. They surrender. This stage is also called Neuroendocrine Failure. When Adrenal Fatigue Syndrome has advanced to this stage, the line between AFS and subclinical and clinical Addison’s disease, also called adrenal insufficiency, can be blurry. We may see the emergence of typical symptoms of Addison’s disease: extreme fatigue, weight loss, muscle weakness, loss of appetite, nausea, vomiting, hypoglycemia, headache, sweating, irregular menstrual cycles, depression, orthostatic hypotension, dehydration, and electrolyte imbalances. The body appears to have lost its normal homeostasis and is breaking down. Intensive conventional multi-disciplinary medical attention is needed to achieve stabilization well beyond what can be done naturally. Hospitalization may be required. This stage will not be our concern in Adrenal Fatigue Syndrome.

For purposes of prevention and overall health trends, the information about Stages 1 and 2 is useful and important. However, most have slipped into Stage 3 by the time they see their doctors. Therefore, recovery concerns are foremost at this stage and, as you will see, other organ systems become involved.

**A Closer Look at Stage 3 and the Speed of Functional Decline**

So far, we’ve described the stages of AFS in general terms. However, in terms of recovery, we will keep our focus on Stage 3, Adrenal Exhaustion, and its phases. We do so because those in Stages 1 and 2 usually recover on their own and seldom seek professional help.

Stage 3 is important because most people begin to realize that something is wrong, and that they aren’t snapping back to their normal energy levels. In addition, other symptoms, seemingly unrelated, might surface and persist.

As a general overview, we can understand how AFS progresses by reviewing the stages and phases, and match them with the following chart, *The Speed of Functional Decline*. As you can see, the vertical line shows fatigue levels, the horizontal line marks Stages 1 to 4, and in the case of Stage 3, Phases 3A to 3D. You will also see a horizontal line, the Adrenal Symptoms Threshold (AST). Symptoms of AFS start to be clinically visible when this threshold is penetrated on the downside. The curved line, then, traces...
the progress of symptoms and stages downward from asymptomatic to below the AST. The lowest line represents the level at which the adrenals are no longer able to produce sufficient hormones for basic normal function, though there is enough for survival.

This diagram shows the way in which Adrenal Fatigue Syndrome usually progresses through the stages over time, based on our experience. We caution, though, that the diagram is not meant to help you self-diagnose AFS, which is not a disease. However, it helps to paint a broad picture of the clinical presentation based on a typical history. We see tremendous variation in each person’s progression.

You can see from the chart that by Stage 3A, early exhaustion, the sufferer has noticeable mild to moderate fatigue that is nearly constant and stays below the AST. This may occur because of prolonged stress or the individual has ignored the warning signs of Stage 2.

Unresolved stressors are the main triggers from Stage 2 into 3A. By the time Stage 3A hits, rest helps, but the fatigue doesn’t go away totally, even after rest. Generally,
without effective intervention, things get worse over time and eventually get to Stage 3B where fatigue is constant. You can see from the graph that the curve is like a ski slope from 3B to 3C, which means we see increased velocity of the symptoms. At this stage, AFS is progressing quickly.

The journey from 3C to 3D is steeper and more like a cliff than a gentle ski slope. It takes the individual below the line at which the hormone level drops below what is needed for basic normal adrenal function. This is the point, between 3C and 3D, at which AFS is severe enough to render sufferers bedridden most of the time.

To be clear, falling below this adrenal threshold doesn’t mean that the person can’t sustain life, but it does mean that the other hormones are not easily primed. The body can still survive, but is in slowdown mode to conserve energy. That’s why 3D is called near failure.

The General Anatomy of Stage 3

Using fatigue as an indicator within Stage 3:

• In Stage 3A, mild fatigue is constant, and the person could have low thyroid, or a woman could experience premenstrual syndrome (PMS). Rest usually doesn’t bring about total recovery, but individuals in this stage function at about 75-100 percent of normal capacity.

• In Stage 3B, mild to moderate fatigue is constant and these individuals do not get 100 percent recovery with rest. In terms of daily activities, they function at about 50-75 percent capacity. Symptoms of thyroid problems, estrogen dominance, and low libido often occur concurrently. Exercise becomes problematic.

• In 3C, the capacity to carry out normal activities is severely curtailed, down to 25-50 percent. These individuals might have to work part time, or often they are unable to work, or they try to work from home.

• In 3D, most are unable to work and are incapacitated.

Our clinical experience shows that in the early stages of AFS, those with mild to moderate fatigue often feel recovered after a nap of thirty minutes or so, but by Stage 3A it takes an hour-long nap to feel fine again. By 3B they need a nap of thirty minutes
to two hours, but by 3C they need one to four hours to be fine. By the time sufferers reach late 3C or 3D, they need six to twelve hours of rest or more. Clearly, considerably more rest is needed between Stages 3C and 3D. It should be noted that these nap times are above and beyond regular sleep time. This is particularly important for those in advanced stages of AFS because their sleep cycle is usually disrupted and sleep quality goes down.

At 3D many sufferers are essentially bedridden. Those with symptoms of Stage 3D are in an extremely sensitive state, often feeling worse if they take supplements, for example. In addition, they often are in a catabolic state, which means the body’s protein is breaking down and these individuals are losing weight. Digestion is usually breaking down, too, and these people may become constipated or unable to tolerate regular food well.

The Contrast and the Progress of Stage 3

As you can see, Stage 3D starkly contrasts with Stage 1. For sure, many people mask fatigue with coffee and sugar, but they don’t see a problem doing so and consider treating fatigue this way as normal. When people notice themselves using stimulants like caffeine and sugar more and more, they may begin to sense that something is wrong. For example, their symptoms may slip below the AST and into Stage 2. Perhaps they see what is happening as a lifestyle issue, which then prompts them to take supplements, exercise, and make dietary changes they assume are beneficial (that may or may not be). In essence, Stage 2 is a little more symptomatic than Stage 1.

The steep decline that occurs in Stage 3 produces many symptoms that often confuse patients. As we’ve said, in 3A, sufferers experience fatigue and perhaps PMS or low thyroid function, but they don’t feel too bad, all in all. They may miss identifying this stage totally if they are not alert.

Early in Stage 3A, symptoms characteristic of Stages 1 and 2, although mild and inconsistent, now become noticeable, and, in fact, chronic. Most see their doctor for the first time during this phase. This phase signals the onset of internal systems malfunction.

If the condition worsens, multiple endocrine axis imbalances tend to occur, which signals 3B. In women, we commonly see 3B manifested as ovarian-adrenal-thyroid (OAT) axis imbalance; in men, it manifests as adrenal-thyroid axis (AT) imbalance (see Chapter 8, Stage 3B—Hormonal Axis Imbalances). OAT axis disturbance can signal symptoms consistent with estrogen dominance, such as irregular menses, fibrocystic breast, low libido, possible uterine fibroids, and endometriosis. Those
already taking thyroid replacement medications may need increased dosages to achieve the same result. Both men and women report low libido and increased fatigue.

As AFS progresses through these phases in Stage 3, other changes occur. For example, slightly elevated blood pressure, common in Stage 2, might change and become low throughout the day as Stage 3 progresses; mild musculoskeletal pain could turn into chronic myalgia of unknown origin; frequent recurrent infections are the norm (as compared to intermittent infections); feeling blue becomes mild depression, and disrupted sleep patterns become chronic insomnia; and fatigue that occurs at the end of a stressful day becomes an everyday event. Individuals may note a subtle, moderate change in their ability to carry out normal daily activities.

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Not all organs are dysfunctional to the same degree and at the same time. The organ system that is constitutionally weakest is the first one to decompensate, while other organ systems appear to be intact.

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For example, a person may complain of severe insomnia, but is otherwise feeling okay, relatively speaking. Usually, these sufferers continue activities and follow self-guided programs or regimens under the care of health professionals.

As Stages 3A and 3B gather steam, the body continues its downward path to greater impaired function, gradually becoming severely compromised in its attempt to maintain the fine controls of homeostasis. Normal equilibrium is lost, and the body enters a state of disequilibrium (Stage 3C). Mild to moderate fatigue characterizes the early phases; moderate to severe fatigue becomes the norm in Stage 3C and beyond. The body has lost its internal balance. Emergency systems are being activated as the alarm bell sounds.

Your body will try its hardest to maintain equilibrium with the activation of the autonomic nervous system (ANS) as a reactive compensatory mechanism. The ANS is an adaptive system, largely working outside the range of consciousness, to adapt to changing internal and external conditions.

By late Stage 3C, the ANS may itself be dysfunction due to overwork. Along with previous hormonal axes imbalances and receptor site dysregulation, the body is left with impaired metabolic, clearance, and detoxification pathways. This damage often gives rise to paradoxical, unpredictable, and exaggerated reactions and outcomes. For example, a person might have reactive blood sugar imbalances, that is, a quick rise in blood sugar after a meal, followed by a precipitous drop. Blood pressure might become fragile and unstable. It might drop suddenly when going from a
supine to a sitting position (postural hypotension) along with a rapid increase in the heart rate, a phenomenon resembling subclinical POTS (postural orthostatic tachycardia syndrome).

Symptoms indicative of advanced Adrenal Exhaustion include heart palpitations, dizziness, sudden onset of anxiety, a feeling of being wired-and-tired, internal dysbiosis (imbalance in intestinal flora), acid-based imbalances, and adrenaline rushes. We may also see fluid and electrolyte imbalance, such as insufficient sodium (salt) in fluids outside the cells (hyponatremia).

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The boundaries of each phase are decidedly indistinct and do not represent an absolute sequential gradation process. Most of those suffering from Adrenal Exhaustion usually report concurrent signs and symptoms in varying degrees of each of the earlier phases. That is the norm. The more advanced the exhaustion, however, the more we see late phase manifestations.

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If left unattended and as AFS advances, the body’s key hormones, such as cortisol and aldosterone, might fall close or below the minimum required reserve for normal function and output. When this occurs, the body may down-regulate the amount of hormones needed in order to preserve what is on hand for only the most essential body functions. Extreme fatigue is common. We characterize this near failure state as Stage 3D. The body goes into full surrender as it gives up trying and simply does what it can to reduce energy-out to stay alive. In other words, the body is now in survival mode.

**Dealing with Stage 4**

When it comes to Stage 4, without aggressive conventional medical management, the body can continue to deteriorate and may ultimately collapse; we are talking about a situation in which the adrenals have become totally exhausted. The body’s neuroendocrine response mechanism gives up and surrenders. The symptoms are extreme. Addison’s disease now becomes part of the differential diagnosis. Patients suffer severe symptoms, including, of course, extreme fatigue. The body is in a catabolic state and most at this stage lose weight. Many are unable to eat regularly and become weaker. Medical attention is mandatory, and, unless there is intervention, the body can continue to deteriorate, leading to collapse.
The Big Picture

Taking a step back and looking at the big picture, we hope you can see that Adrenal Fatigue Syndrome is nature’s systematic and logical neuroendocrine response in an orchestrated collapse when the body’s complexity handling ability has been overwhelmed. AFS progression tends to be confusing for most because many organ systems are involved concurrently. The body, in its infinite wisdom, is in full control of the level of neuroendocrine stress response it sees fit to activate. Symptoms appear to defy conventional medical logic, not because they are illogical, but because we fail to look at them from a neuroendocrine perspective where the stress response is primarily regulated.

We need to look at the body as a whole unit. The more one focuses on each symptom, the easier it is to miss the big picture.

It is important to take a step back. The big picture will emerge and will clearly point to a breakdown in bodily functions as the body struggles for survival.

We can see the progress of Adrenal Fatigue Syndrome most clearly when we look at the phases that appear in Stage 3, which we discuss in the chapters that follow.

Key Points to Remember

- Stage 3 is called Adrenal Exhaustion. The adrenals are no longer able to keep up with the body’s demand for cortisol and start to fall below normal.
- Stage 3 is further divided into 4 phases, A through D.
- Stage 3A is called Early System Dysfunction. Fatigue characteristic of Stages 1 and 2 worsens. One sees early onset of a variety of medical conditions such as mild forms of insomnia, back pain, low blood pressure, hypoglycemia, anxiety, depression, and recurrent infection.
• Stage 3B is called Hormonal Axis Imbalances. The ovarian-adrenal-thyroid (OAT) axis in women and adrenal-thyroid (AT) axis in men are involved.

• Stage 3C is called Disequilibrium. The entire body is on full alert, and the autonomic nervous system is on full throttle as emergency measures are activated as the body tries to compensate on its own. Crude reserve systems are activated and a strong mind-body connection is evident. Symptoms such as depression, panic attacks, and dizziness may occur. The deepest decline in function and the greatest fatigue occurs from Stages 3C to 3D.

• Stage 3D is called Near Failure. The adrenal reserves are near depletion. Basic normal adrenal function is in jeopardy as the amount of hormones needed to prime other hormones becomes dangerously low. The body starts surrendering.

Stage 4 is called Adrenal Failure. The adrenals are totally exhausted and the body enters an emergency mode of operation for survival. Medical intervention is needed.
Chapter 3

Stage 3A—Early System Dysfunction

As you have seen from the overview of Adrenal Fatigue Syndrome, many experience symptoms that seem unrelated, confusing, and even mysterious. For this reason, it is easy even for health professionals to miss the big picture, which is why many patients sense that their physicians don’t view the symptoms as seriously as merited. These issues begin to magnify in Stage 3, which is why we’re taking a closer look at this stage and its phases.

In this stage, one or more of the body systems has weakened to such a point that a pathological subclinical or clinical state of the affected system surfaces. The organ system that is constitutionally the weakest or most sensitive usually is the first to exhibit the most prominent weakness. Some of the more common symptoms include hypoglycemia, low blood pressure, brain fog, and recurrent infections. These symptoms represent the onset of underlying system dysfunction or dysregulation, in particular the hypothalamic-pituitary-adrenal (HPA) axis we discussed in Chapter 2, Stress, Hormone Basics and the “Forgotten” Adrenals.

Some of the commonly affected systems are worth examining in detail.

Metabolic System Dysfunction

Metabolic system dysfunction is considered a pre-diabetic state and shows itself as glucose intolerance, insulin resistance, hypoglycemia, central obesity, low HDL (the good cholesterol), and high triglycerides. Any or all of these signs and symptoms may already be present in the earlier stages of AFS. In fact, many individuals have already been taking prescription drugs for lipid abnormalities (such as high LDL and low HDL) for some time by the time they reach this phase. These signs and symptoms also may meet the criteria of metabolic syndrome discussed in Chapter 1, The Adrenal Fatigue Syndrome. If not present before, they start to become more prominent in Stage 3A as the adrenal cortisol level starts to drop below normal and other hormonal imbalances become more obvious.

If left unattended, these warning signs of metabolic syndrome can lead to diabetes and accelerated arthrosclerosis. The most important and common clinical and early warning sign of this impending danger in the presence of Adrenal Fatigue Syndrome
is subclinical hypoglycemia, where there are signs of low blood sugar but the laboratory fasting sugar level is normal.

In a healthy body, blood sugar is maintained within a narrow range to ensure smooth functioning. We experience this as even energy throughout the day. This maintenance occurs quietly in the background without our knowledge. When Adrenal Fatigue Syndrome is present, this automatic mechanism can be dysfunctional. In other words, the body’s effort to return to normal blood sugar is not well regulated. It can be overly reactive, slowed, delayed, or crude in its response. All these are possible. The clinical picture can be confusing and at times quite vague.

The onset of hypoglycemia can be acute or chronic. It can be precipitated by what appears to be something harmless. Consider the following history from Betty, a thirty-three year old corporate executive under constant stress:

I was very healthy and ran almost every day up until six months ago. I skipped breakfast for three straight days with late lunches because I was too busy and was sometimes without food sixteen hours at a stretch. By the third day, I felt weak, with dizziness, nausea, and diarrhea. I did not faint, but it was close.

Despite returning immediately to a regular eating schedule, my symptoms did not go away. In fact, they got worse. I have never been the same since.

I have seen six specialists, all without helping me. All my medical workups are normal. I now have to eat every few hours to avoid hypoglycemia. I have also started to develop sensitivity to many foods, including rice, pasta, chicken, beef, and certain types of fruits. Now my diet is severely restricted. I even have to bring my own food to restaurants.

Let’s look at the physiology behind Betty’s problem.

**Hypoglycemia and Adrenal Fatigue Syndrome**

In Adrenal Fatigue Syndrome, the body’s need for a continuous supply of energy throughout the day is much greater than normal. This demand is usually met with food consumption, which we then convert to sugar. If this demand is not met adequately, as often happens with Adrenal Fatigue Syndrome, the body turns to existing resources of protein and fat in the body to use in order to keep up with the energy demand. This internal energy synthesis pathway is put on overdrive.

Key hormones regulating blood sugar in the body include insulin, cortisol, and growth hormone. The role of cortisol is particularly important. Its level must be adequate to facilitate the conversion of glycogen, fats, and proteins to new glucose
supplies, thereby elevating blood sugar levels. If cortisol is inadequate then it is difficult or even impossible to meet this increased demand and hypoglycemia can result. In the absence of other medical reasons for episodes of hypoglycemia, we must consider Adrenal Fatigue Syndrome as a possible cause.

When a person suffers from Adrenal Fatigue Syndrome, hypoglycemia is often associated with a combination of low cortisol and high insulin levels. This perfect storm commonly occurs when the body is under stress, either acutely or chronically. As AFS progresses into advanced stages of exhaustion, the output of cortisol lowers, and glucose release is slowed as well. This occurs along with insulin dysregulation, because the pancreas is put on overdrive as part of the ongoing stress response during earlier stages of Adrenal Fatigue Syndrome. Those who have a family history of or predisposition toward diabetes are particularly vulnerable. The body can be put in a position where it needs more glucose, but at the same time glucose regulation is not functioning properly. This combination of dysfunctions can lead to hypoglycemia and its common symptoms, among them are dizziness and fainting.

**Clinical Definition of Hypoglycemia**

Within a twenty-four hour cycle, healthy people generally maintain blood glucose levels between 4.4 to 6.1 mmol/L (82 to 110 mg/dL); or 3.3 or 3.9 mmol/L (60 to 70 mg/dL) are commonly cited as the lower limits of normal glucose.

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**Note: Millimoles per liter, expressed as mmol/L is the world standard unit for measuring glucose in the blood. The U.S. and a few other countries use mg/dL.**

Although the medical community agrees on what constitutes the normal blood sugar range, debate continues about what degree of hypoglycemia warrants medical evaluation and treatment, or that can potentially cause harm. The reasons are simple. Many healthy people can occasionally have glucose levels in the hypoglycemic range without any problem or signs of hypoglycemia. This adds to the difficulty of establishing hypoglycemia as a clinical state in the first place. They do well and are asymptomatic, but they routinely have a blood sugar level of under 90mg/dL. The situation is even more complex in those with Adrenal Fatigue Syndrome, because manifestations of hypoglycemia are more often than not subclinical. The individual has signs of hypoglycemia even though the blood plasma level is above 60-70 mg/dL. Fasting serum blood sugar and glucose tolerance tests are usually normal.
The diagram below shows how AFS can clinically affect hypoglycemia. After a meal, those in this phase tend to have a faster dip in blood sugar to below the hypoglycemic symptoms threshold (HST) level, which triggers symptoms of hypoglycemia such as irritability and fatigue. The more advanced the Adrenal Fatigue Syndrome, the more the blood sugar curve shifts toward the left. As a result, the time between finishing a meal to the onset of hypoglycemic symptoms shortens.

In AFS, hypoglycemic symptoms usually begin while the blood sugar is still within normal range. Therefore, we tend to believe that the underlying trigger of these symptoms is tied to the blood sugar drop itself more than the absolute level of blood sugar. In other words, it’s the sensitivity to and perhaps the velocity of the drop that triggers hypoglycemic symptoms. That may be why the majority of sufferers of advanced AFS report some degree of such reactive hypoglycemia, even though their blood glucose is normal in laboratory testing.

The more advanced the AFS, the more intense the hypoglycemia in terms of symptoms and frequency. For this reason, those in Stage 3 AFS and beyond may need to eat every 2-3 hours, even if only a small snack, to prevent hypoglycemia during the day. As sufferers recover, then the time between meals and snacks can lengthen. In contrast, those in Stage 2 AFS can go 4-6 hours without food and not experience either hunger or symptoms of hypoglycemia. Many in Stage 1 can skip a meal and have no symptoms at all. Signs and symptoms of such reactive hypoglycemia usually improve as adrenal health is optimized.
Symptoms of Hypoglycemia

The symptoms of hypoglycemia are wide and varied. When they are subclinical, as they most often are at this phase, symptoms can be vague and therefore often miss detection. They include:

- hunger
- nausea
- headaches
- elevated heart rate
- a tendency to daydream
- confusion
- memory loss/amnesia
- dizziness
- irritability
- anxiety/jittery feelings
- rage
- in severe cases, fainting, coma, and seizures

During Stage 3A, hypoglycemic symptoms tend to be very mild. Because of this, they are more often than not under investigated and become evident only in retrospect, unless the hypoglycemia is severe.

We can temporarily reverse acute hypoglycemia by taking 10-20 grams of carbohydrate, the equivalent of 3-4 ounces of orange, apple, or grape juice. Unfortunately, too many people turn to one of the common sugar fixes that are so much a part of our society. They reach for a sugary drink or coffee or a sugary snack, but this is only a short-acting emergency remedy. It relieves symptoms immediately, but they return in an hour or two.

To reactivate and restore normal cell function, the body requires amounts of energy beyond what is normally required to maintain normal energy burn. In addition, with each hypoglycemic episode, more cells are damaged. Thus, the body reaches a new low. If this occurs at the same time the demand for glucose increases, the stage becomes set for an adrenal crisis. With each plunge of blood sugar, AFS increases and the hypoglycemia worsens. By the end of the day, a person might feel nearly exhausted but without having done anything. Episodes of low blood sugar are most likely to occur at around 10:00 AM and 2:00 PM, and/or between 3-4:00 PM.
Hypoglycemia Prevention Tips

You need a systematic and comprehensive approach to prevent and reverse the chronic subclinical hypoglycemia associated with Adrenal Fatigue Syndrome. We recommend following the guidelines in Chapter 23, *A Healing Diet for Adrenal Fatigue Syndrome*, which help those with blood sugar fluctuations and Adrenal Fatigue Syndrome. Below are key strategies you can implement now:

- Consume protein (such as nuts, meats, fish, poultry, beans, cottage cheese, whole milk yogurt) and fat (nuts, extra virgin olive oil, coconut, avocado) with each meal or snack. This leads to a slower release of sugar in the body and thus extends the time before you become hypoglycemic between meals.

- Plan frequent meals and snacks, i.e., 3 meals a day—breakfast, lunch, and dinner—plus midmorning, mid-afternoon, and bedtime snacks. Include protein and fat with each meal or snacks.

- Avoid the so-called sugar and flour foods—dessert foods and snack foods.

- Make sure you consume at least 1200 calories per day, even if you are trying to lose weight.

- Listen to your body. Sometimes you may need to eat something every two hours, especially if your work requires intense mental concentration or is very physical.

- Don’t leave the house without taking along portable snacks, such as nuts, and keep them with you wherever you go.

- Follow the glycemic index (GI) described in Appendix B.

Snacks to Help Avoid Blood Sugar Dips

- whole milk yogurt and berries
- apple with almond butter
- nuts and fruit
- celery stick with cream cheese or nut butter
- refried beans
- cream cheese and salmon or tuna on a whole grain cracker.
Sample Breakfasts to Help Avoid Blood Sugar Dips

A good breakfast is important to replenish lost energy from a night’s sleep. Consider the following:

• muesli (non-sweetened granola) with whole milk yogurt, nuts, and whole fruits
• nuts and green apples
• poached egg on sprouted wheat bread
• smoothie made with avocado, coconut, whole milk yogurt, nuts, and raw egg
• vegetable omelet
• cream cheese and salmon on whole grain bagel
• cooked oatmeal with nuts and fruits

Electrolyte Dysregulation Resulting in Low Blood Pressure (Hypotension)

Blood pressure is an important indicator of adrenal health and function. Stages 1 and 2 of Adrenal Fatigue Syndrome usually are accompanied by normal to high blood pressure as cortisol and aldosterone output peaks. As AFS advances, low blood pressure, at rest or related to posture, becomes more prevalent. Weak adrenals can drastically alter the blood pressure landscape in the body, leading to a wide variety of symptoms such as dizziness, lightheadedness, orthostatic (related to position of the body) hypotension (low blood pressure), and heart palpitations. Many of these symptoms show themselves for the first time during this phase.

Blood Pressure Basics

Blood pressure is the force exerted by circulating blood on the walls of blood vessels. It constitutes one of the key vital signs of life, along with heartbeat, rate of breathing, and temperature. Blood pressure is generated by the heart pumping blood into the arteries and is regulated by the response of the arteries to the flow of blood.

Blood pressure is expressed as systolic/diastolic, for example, 120/80 is 120 systolic over 80 diastolic. The systolic blood pressure (the top number) represents the pressure in the arteries as the muscle of the heart contracts and pumps blood into them. The
diastolic blood pressure (the bottom number) represents the pressure in the arteries as the muscle of the heart relaxes after it contracts. Blood pressure is always higher when the heart is pumping (squeezing) than when it is relaxing.

Systolic blood pressure for most healthy adults falls between 90 and 120 millimeters of mercury (mm Hg). Diastolic blood pressure falls between 60 and 80 mm Hg. The commonly accepted guidelines define normal blood pressure as lower than 120/80. Unlike high blood pressure (hypertension), low blood pressure is defined primarily by signs and symptoms of low blood flow and not by a specific blood pressure number, meaning blood pressure readings that fall below a certain threshold. Vegetarians generally have low blood pressure readings, and at the same time, they can be healthy and asymptomatic. Individuals with a blood pressure of 90/50 might have no symptoms of low blood pressure. Therefore, they do not have clinical low blood pressure. However, those who normally have high blood pressure may develop symptoms of low blood pressure if the reading drops to 100/60.

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The body’s organs may be damaged if the blood pressure is not high enough to deliver adequate blood flow to the organs of the body. Signs of insufficient blood flow to the brain/brain cells include lightheadedness, dizziness, or fainting. If the blood pressure is already low, standing up can make it drop further, potentially causing severe dizziness and even fainting episodes (orthostatic hypotension).

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When a normal person stands after lying down, gravitational forces cause blood pressure to drop, which immediately triggers the autonomic nervous system (ANS), which regulates the blood pressure to return to normal. The rise in pressure on standing usually ranges from 10-20 mm Hg. This overshoot normalizes in a short time and the overall blood pressure returns to normal. Under normal circumstances, a healthy person doesn’t feel this behind-the-scenes automatic adjustment. However, when dysfunction exists in the ANS, which we often see in advanced Adrenal Fatigue Syndrome, the blood pressure fails to normalize which may result in orthostatic hypotension (also called postural hypotension). Other causes of orthostatic hypotension include dehydration, dysautonomia, medication side effects, and heart disease. If you experience postural hypotension, then investigate the issue with your physician to see if the symptoms are clinically significant.

When at rest, it is not considered abnormal to have low blood pressure. Many individuals have resting blood pressure under 90/60 and function very well. We
evaluate the clinical significance or insignificance of low blood pressure by whether it is accompanied by symptoms, and whether or not it is related to postural position.

**Aldosterone and Blood Pressure**

Aldosterone is a salt-retaining hormone. It is responsible for maintaining the concentration of sodium and potassium inside and outside the cells, which in turn has a direct effect on the amount of fluid in the body. Therefore, aldosterone plays a significant role in regulating blood pressure.

As you may recall, aldosterone is a hormone manufactured in the adrenal cortex under the direction of ACTH (adrenocorticotropic hormone), produced by the anterior pituitary gland. ACTH stimulates the adrenal cortex via the HPA axis to secrete a wide variety of hormones including aldosterone and cortisol. Like cortisol, aldosterone follows a daily secretion pattern peaking at 8:00 AM. Its lowest point is between 12:00 AM to 4:00 AM.

A sequence of events can change fluid balance and blood pressure. Remember that sodium and water go hand in hand—where sodium goes, water follows. In addition, sodium and potassium oppose each other. As the concentration of aldosterone in the body rises, the concentration of sodium and water rises and more fluid is retained in the body, and then blood pressure rises. Conversely, when the level of aldosterone lowers, the amount of sodium and water in the body is reduced, and blood pressure goes down. Excessive aldosterone leads to high blood pressure, high sodium, and low potassium. Deficiencies of aldosterone in the dysregulation of the HPA axis can lead to low blood pressure, a compensatory high pulse rate, dizziness especially on standing, salt cravings, and palpitations. Severe cases may lead to high potassium and low sodium in the blood.

Unlike cortisol, aldosterone does not have its own negative feedback loop. If the aldosterone level is too high, aldosterone receptor sites will be down-regulated and their sensitivity to aldosterone reduced. Because stress stimulates ACTH production, in the early stages of Adrenal Fatigue Syndrome the amount of cortisol and aldosterone increases. As a result, the body retains sodium and water, which causes a bloated feeling. As blood pressure starts to rise due to increased blood volume, the baroreceptors (receptors that are sensitive to pressure) of the blood vessels are triggered. This automatically sends muscles within the blood vessels into relaxation mode. Blood pressure comes down and is normalized.

This auto-regulation helps to maintain stable blood pressure at a time when the total fluid volume increases because stress has triggered high levels of aldosterone.
With stress, the adrenal glands also secrete norepinephrine and epinephrine, hormones that constrict the blood vessels and increases blood pressure. This ensures that our brains have adequate blood flow and oxygen to help us deal with impending danger. The adrenals also release cortisol in response to stress. Cortisol also contracts mid-size blood vessels, though with less potency than epinephrine. In early stages of AFS, it is not unusual for our blood pressure to be high if not normal.

As AFS progresses to Stage 3A, output of cortisol and aldosterone generally start falling because of the reasons explained above. We start to see subclinical deficiency of cortisol, aldosterone, or both. Despite compensatory efforts to increase blood pressure by the body, the overall net blood pressure tends to fall.

**AFS and Low Blood Pressure**

Ultimately, several factors determine blood pressure readings at any point in time, including the actions of aldosterone, renin (an enzyme released by the kidneys), cortisol, epinephrine, norepinephrine, blood volume, HPA axis integrity, and the autonomic relaxation response. As you can see, it’s a complicated process. When the body is under stress, it releases chemicals that raise blood pressure, and this sets off a series of compensatory responses that lowers blood pressure if the body is otherwise intact and functioning normally. If the body is unable to overcome the high aldosterone and epinephrine response, then elevated blood pressure results. Therefore, as most of us have heard, stress often causes increased blood pressure.

If the adrenals are exhausted because of stress, the picture changes drastically, because the adrenals are unable to mount a compensatory response. We start to see reduced aldosterone production, and sodium and water retention is compromised. Fluid volume is reduced, and the blood pressure becomes low. As a result of this process, cells become easily dehydrated and deficient in sodium.

To complicate matters further, most people with advanced AFS invariably also have some degree of autonomic nervous system dysfunction. ANS is one of three modulators of a hormone called renin. Renin activates the renin-angiotensin hormonal axis system (RAS), which ultimately leads to an increase in blood pressure. Many with severe adrenal weakness might also have symptoms consistent with subclinically low levels of renin and aldosterone. When this occurs, we can see low blood pressure along with salt cravings. This can exacerbate preexisting fatigue because oxygen delivery to the brain is reduced. Other symptoms, though less common, can include reduced hearing function, vertigo, visual disturbances of unknown origin, tingling, anxiety, and headaches.
In order to compensate for this fluid imbalance, the body leaks potassium 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. Therefore, most with advanced AFS have higher potassium relative to sodium load, although laboratory tests of both continued to be within or slightly outside the normal range. Sufferers may also experience a drop in blood pressure and an increase in pulse rate upon standing. Symptoms closely resembling POTS (postural orthostatic tachycardia syndrome) at a subclinical level may arise.

Other Common Causes of Low Blood Pressure

Prior to considering Adrenal Fatigue Syndrome as the culprit, we recommend investigating these other causes of low blood pressure:

**Heart disease:** Heart disease has many manifestations, such as weakened heart muscle, pericarditis (inflammation of the pericardium, the sac that envelopes the heart), bradycardia (slower than normal heart action), arrhythmias (irregular heart beat), and heart block (defective coordination of heart rhythms). Tachycardia (rapid heartbeat) can also lead to low blood pressure, as the heart is unable to maintain the stroke volume (volume of blood pumped in one beat) to supply adequate blood flow to the body.

Arrhythmia is more prevalent in those with ANS (autonomic nervous system) dysfunction. Persistent overtone of the SNS (sympathetic nervous system) increases the release of norepinephrine; chronic increases of norepinephrine can lower the heart’s threshold for cardiac arrhythmia, including atrial fibrillation. We see this situation in advanced Adrenal Exhaustion.

**Medications:** Medications such as calcium channel blockers, beta-blockers, and digoxin (Lanoxin®) can slow the rate at which the heart contracts. Elderly people are especially susceptible, because these days, they typically take medications to treat high blood pressure. However, these medications can lower blood pressure too much, thereby producing symptomatic low blood pressure as well. Water pills (diuretics) often taken with other medications for hypertension, such as furosemide (Lasix®) can decrease blood volume by causing excessive urination.

Other drugs that can cause low blood pressure include: Medications used to treat Parkinson’s disease, such as levodopa-carbidopa (Sinemet®); medications used for treating depression, such as amitriptyline (Elavil®); drugs used to treat erectile dysfunction (impotence), such as sidenafil (Viagra®), vardenafil (Levitra®), and tadalafil (Cialis®) (when used in combination with nitroglycerine).
Less common causes of low blood pressure include septicemia (blood infections), alcoholism, diabetes, shock, kidney disease, vasovagal (involves both blood vessels and the vagus nerve) reaction, micturition syncope (cessation or interruption of urinary function), anaphylaxis (hypersensitivity to certain agents), and certain rare neurological syndromes such as Shy-Drager syndrome, which damage the ANS, and Addison’s disease.

**Dehydration and Fluid Imbalance**

Aside from low blood pressure, sodium and potassium imbalance often lead to fluid depletion. In a person with advanced AFS, dehydration is quite common, but often overlooked as a relevant symptom associated with AFS. Such sensitivity to fluid depletion can be extreme. For example, those with advanced AFS may find a few minutes of exposure to strong sunlight a draining experience. This is particularly challenging for men and women who live in a hot and humid environment, especially when they’re outdoors. These are signs of low marginal fluid reserve within the body.

When the fluid balance within the body is off, temperature control becomes a problem; many report temperature intolerance as well. The more fluid and electrolytes are dysregulated, the higher the chances that dehydration will trigger adrenal crashes. This is why we recommend that AFS sufferers carry a water bottle with them at all times, with a bit of salt or lemon added. These individuals should consume fluids with adequate electrolytes many times a day in intermittent dosages, while avoiding coffee, alcohol, and tea (with the exception of herbal tea).

Lost fluids should be replaced carefully and slowly. When lost 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, a state called *dilutional hyponatremia*. Low sodium can produce non-specific symptoms of confusion, lethargy, nausea, headache, seizure, weakness, and restlessness. This in turn worsens AFS.

In Stage 3A of AFS, fluid and electrolyte imbalances are usually in a mild sub-clinical state, whereas laboratory tests are normal. Because of its mildness, most are passed over as insignificant.

As AFS progresses, however, the clinical picture can change drastically. Dehydration, along with low sodium, leads to a convoluted picture that often defies conventional medical logic. We see many sufferers who have gone to the local emergency room because of these disturbing symptoms, only to have an extensive workup and then be told that all is normal. For example, in those who are severely decompensated and in a highly sensitive state consistent with advanced weakness, the
electrolytes may fall within the normal range, even while symptoms persist. In severe cases, hospital admissions may be required and diuretics taken to reduce fluid load, while sodium is being replaced.

Commercially available electrolyte replacement drinks (i.e., Gatorade®) are designed for people who have normal adrenal function, but experience excessive loss of electrolytes during exercise. This is why these drinks are high in sodium, low in potassium, but quite high in sugar. If AFS is very mild, it’s okay to consume these drinks as a fluid replacement, but those with advanced Adrenal Fatigue Syndrome usually have sugar imbalances and low sodium level. This is why we recommend drinking filtered water with a bit of salt added, especially in the morning upon awakening, for those who are stable. If blood pressure increases, or signs of edema (water retention) occur and nausea develops, stop the salt and tell a qualified health practitioner about what has occurred.

Only a small number of people in advanced stages of Adrenal Fatigue Syndrome have concurrent high blood pressure, and those falling into this category should check their blood pressure carefully during fluid replacement.

**Suboptimal Detoxification Leads to Low Clearance**

As the body adapts to an environment of lower energy supply, by necessity, the function of all major systems starts to slow down to prevent the body from entering a net negative energy state. Processing and excreting waste byproducts after nutrients have been assimilated by the cells is an important function. In the presence of advanced AFS, this function is invariably compromised, along with the body’s digestive and absorptive mechanisms.

The liver is the major detoxification center, acting as a filter to remove foreign substances and wastes from the blood. For example, the liver clears toxins such as alcohol, solvents, formaldehyde, pesticides, herbicides, and food additives. The liver functions to convert toxins into compounds that the body can safely handle and remove through the kidneys (as urine), skin (as sweat), lungs (as expelled air) and bowels (as feces). The liver is also responsible for breaking down nutrients, medications, vitamins, and hormones into small, inert metabolites.

Unwanted waste byproducts and metabolites are normally excreted out of the body on a timely basis. With suboptimal or slowed clearance, the body might slowly accumulate undesirable waste byproducts or metabolites. They remain in circulation. The more advanced the fatigue, the more serious this problem becomes. Unwanted metabolites accumulate and can turn toxic inside the body. This leads to a variety of undesirable symptoms tied to inflammatory responses.
When excessive circulating metabolites find a home in the extracellular spaces of joints, joint pain of unknown origin may result. Some are deposited into the muscles, contributing to myalgia. Excessive circulating metabolites tend to be very damaging to our central nervous system as well. Many of these metabolites are fat soluble and cross the blood-brain barrier into the brain, resulting in the often cited brain fog, anxiety, and insomnia. Other complaints can include psychological and neurological symptoms such as depression, headache, abnormal nerve reflexes, and tingling in the hands.

If the internal pH is affected, the incidence of yeast infection (candidiasis) and interstitial cystitis can go up as well. Again, liver function laboratory tests are usually normal at this time. Unfortunately, we have no test sensitive enough to accurately measure clearance, other than a detailed and accurate patient history.

Bear in mind that many healthy adults start to develop food and chemical sensitivities as they grow older, even without developing Adrenal Fatigue Syndrome. Intolerance to wheat, corn, and dairy products is common and can be early warning signs of suboptimal liver function. Unfortunately, this newly occurring symptom is often dismissed as a normal sign of aging.

Brain Fog—a Common Symptom of Impaired Clearance

Many individuals report brain fog at this phase. It is an important clue that something is wrong with the liver and other detoxification centers of the body, even when medical workups are negative. Brain fog is a descriptive phrase, and implies a mental state where memory is clouded and unclear, rather than a loss of immediate or past memory. Instead, individuals tell us that in brain fog their memory is “so close and yet so far” in terms of the recollection ability. They have trouble remembering where they put their keys or what they did yesterday, or they may not be able to concentrate or memorize simple things like phone numbers. However, long term memory remains intact. The ability to concentrate is usually compromised. They might double and triple check their work, yet still be wrong. When severe, this cognitive toll can impair those who work in intellectually intensive careers and jobs; eventually they might be unable to perform their normal duty.

Most brain fog usually is transient, lasting anywhere from hours to days. Assuming no other pathology is present, the duration of brain fog is often related to the degree of liver overload. The more the liver is overtaxed, the longer the brain fog lasts.
Time, proper nutritional support, and increased water intake gently enhance the detoxification process and helps lift the fog.

Brain fog usually spontaneously resolves as the body's detoxification system improves, which usually happens automatically as adrenal function improves.

If the adrenal system is not performing optimally, brain fog may stay for a long time. Sometimes self initiated detoxification helps, but if not done properly, brain fog can worsen because of a retoxification reaction.

Focusing on adrenal recovery as a way to reduce brain fog is a much better way to go.

The Catabolic State and Loss of Muscle Mass

When responding to stress, the adrenal glands produce steroidal hormones, primarily cortisol. As previously stated, cortisol output is usually high in Stages 1 and 2 of Adrenal Fatigue Syndrome, but as AFS progresses, cortisol output is often pushed to its limit. Over time, high cortisol results in excessive breakdown of collagen and protein without sufficient replenishment (catabolic state). Along with reduced liver function, as discussed above, metabolites of the catabolic state increase, leading to chronic pain syndromes, joint pain, chronic fatigue, and fibromyalgia. If not reversed, protein breakdown starts to accelerate in this stage, leading to a gradual loss of muscle mass. The catabolic state results from a chronically high cortisol output. A high cortisol to DHEA-S ratio seen in blood tests can offer clues of this.

The cycle of catabolism is normally followed by a process of rebuilding or anabolism. The rebuilding process is normally carried out by androgens, such as testosterone. Unfortunately, testosterone output also starts to fall as the body slows the nonessential reproductive function. Therefore, the rebuilding process will be slow and sluggish.

This catabolic state usually begins slowly undetected, starting at Stage 3A. In addition to metabolite buildup discussed above, collagen breakdown as part of normal living is not adequately replenished. As this happens, wrinkles begin to develop and premature aging sets in. Strenuous exercise or heavy lifting only further weakens the already fragile collagen support structure further. Outwardly, the loss of large chest muscle mass is not evident yet. However, certain fitness exercises, such as push-ups, can become more difficult.
With advancing AFS, the intercostal muscles (muscles connecting the ribs to each other) start losing mass, and taking a deep breath becomes a chore. Handshakes become weak as small muscles of the hand are also involved and lose muscle mass. If we pay careful attention, we see that no body part is spared. Of course, a person may look normal from afar but is physically frail on close examination. In severe cases, usually in advanced Stage 3C or 3D, some complain that it takes energy just to take a breath. Clearly, under normal circumstances this should be an automatic function.

As the collagen structures of internal organs break down, their functions are compromised. For example, gastrointestinal tract motility (movement) and contraction forces are reduced. Adrenal Fatigue Syndrome is therefore often associated with poor ability to breakdown proteins, and common symptoms include indigestion, bloating, gas, and constipation. The body’s acid production might be insufficient to help break down digested foods, resulting in further digestive problems.

It’s no surprise, then, that secondary fibromyalgia and chronic fatigue syndrome are commonly associated with later stages of AFS. Clinically, we often see Adrenal Fatigue Syndrome symptoms consistent with fibromyalgia and chronic fatigue. Indeed, we could eventually find that these syndromes, which generally do not have agreed upon origins, are part of the cluster of symptoms of adrenal dysfunction.

Neurological System Dysfunction

While the rest of the body is adapting to a lower energy environment in the phase, the brain does not have this luxury. To function properly, energy to the brain cannot be compromised, or a cognitive toll begins. Brain function is the top priority of the body. Mechanisms involved in regulating blood sugar are designed to ensure that the brain always gets an adequate supply of glucose. Symptoms of reduced brain support can trigger a host of neurochemical imbalances leading to symptoms of sluggishness, anxiety, tremors, irritability, and mild depression.

Brain norepinephrine is the primary dysregulated neurotransmitter responsible for many of these symptoms. Depression has been further linked to low levels of cortisol, DHEA, and testosterone, which are linked to reduced adrenal function. So it’s not surprising that Adrenal Exhaustion is strongly associated with increased fears, anxiety, depression, brain fog, and difficulties in concentrating. In addition, those in Adrenal Exhaustion often find themselves intolerant and easily frustrated.

The brain is also relatively isolated from the rest of the body because of the blood-brain barrier. It is lipophilic, meaning that it attracts fat-soluble molecules, such as steroidal hormones. It is easily affected by the lipophilic toxic metabolite buildup mentioned earlier. Hence, brain fog and sleep disturbances naturally follow.
Sleep problems are generally secondary responses to AFS, but they add a significant burden on the body, because sleep deprivation compromises the body’s ability to self-repair. Sleep problems further contribute to AFS, thus setting off a vicious downward spiral of cascading dysfunction, including decreased immunity, impaired glucose tolerance, decreased morning cortisol levels, and decreased alertness and concentration. Again, we must not forget that at this phase, these symptoms are generally mild and escape detection.

Hormonal System Dysfunction

The various glands of the endocrine system have special significance when considering Stages 3A and 3B—early Adrenal Exhaustion. In order to regulate the complexity of the body’s functions, hormonal systems are grouped into networks or axes. These axes are direct conduits and represent another advanced self-regulatory system which is built in to ensure that the body runs smoothly. Chapter 2, *Stress, Hormone Basics and the “Forgotten” Adrenals*, explained the hypothalamic-pituitary-adrenal (HPA) axis, which controls adrenal gland function. Key hormones such as cortisol, aldosterone, estrogen, and progesterone are regulated through this axis.

Problems with hormonal dysregulation start becoming evident in this stage, though signs are usually mild and symptoms generally subclinical. Dysfunction of sugar metabolism leads to hypoglycemia, and salt craving is a common symptom of aldosterone deficiency. Both hypoglycemia and aldosterone deficiency are symptoms of HPA axis dysregulation. The more advanced the AFS, the more hormones become dysregulated.

Remember that hormones are regulatory compounds vital to well-being. For example, testosterone deficiency leads to a loss of muscle mass and low libido. Too much estrogen can lead to fluid retention, fibrocystic changes in the breast, PMS, and endometriosis. Low thyroid leads to dry skin, fatigue, and weight gain. In order to feel good, the amount of each hormone must be maintained. A comprehensive hormonal evaluation requires that we look at them from the following perspectives:

- The absolute excess or deficiency of a specific hormone. This can be measured by laboratory tests. For example, too much cortisol or too little DHEA.
- The relative excess or deficiency of a specific hormone. This is not easily measured by routine laboratory tests. Specialized tests can help but are not diagnostic, and the best assessment tool is a careful history. Estrogen dominance is one example of relative excess or deficiency.
• The imbalance of hormones due to hormonal axis dysregulation, which can only be assessed by careful history. HPA axis dysregulation (discussed in this chapter) and OAT axis imbalance (discussed in the next chapter) are good examples.

In Stage 3A, we see subclinical or clinical evidence of all three categories of dysfunction, which results in early onset of symptoms of hormonal dysregulation.

**How One Hormone Dysregulation Affects Another**

We learned in Chapter 2, *Stress, Hormone Basics, and the “Forgotten” Adrenals,* that imbalances of estrogen and progesterone can lead to estrogen dominance and a continuum of associated conditions, including premenstrual syndrome (PMS), endometriosis, polycystic ovary syndrome (PCOS), cystic breast disease, fibroids, and irregular menstrual periods. Just as estrogen dominance can be attributed to adrenal weakness, the reverse is also true, and AFS can exacerbate estrogen dominance. Remember that cortisol is made from progesterone in the adrenal cortex. Weakened adrenals tend to favor cortisol production, which may lead to lower progesterone levels and promote estrogen dominance. This becomes a vicious cycle.

Thyroid hormone imbalances are common in AFS. In Adrenal Exhaustion, we often see reduced thyroid function which is the body’s way of conserving energy. Low adrenal function, therefore, can worsen thyroid function. Many are told they have hypothyroidism, but in actuality, their adrenals are weak. Those who are already on thyroid replacement medication may in fact need a higher dose in the presence of AFS. In addition, the thyroid is intrinsically related to the ovarian system. Thyroid hormones stimulate progesterone production in the ovaries. As thyroid hormone output is reduced as AFS progresses, progesterone production is compromised. Without adequate progesterone to offset estrogen, we commonly see menstrual cycle irregularity, putting fertilization at risk. Miscarriages are common especially in the first trimester when progesterone demand is not met. Those who have recurrent first trimester miscarriages should always consider AFS as a possible cause. Fortunately, it is not unusual for women to overcome infertility problems when AFS resolves.

The adrenal cortex secretes both male and female sex hormones, but the quantities are small and their effects are usually masked by the same hormones produced in the testes and ovaries. In Adrenal Exhaustion, androgen secretion dysregulation may lead to masculinization, which means that women with estrogen dominance or other hormonal imbalances can develop secondary sex characteristics, such as excessive facial or body hair (hirsutism) and hair loss. Other consequences can include
conditions such as PCOS, seborrhea (a skin inflammation with no known cause), and acne.

Most perimenopausal or postmenopausal women who experience hair loss invariably have some level of adrenal dysfunction.

In males, low libido is an important sign of Adrenal Exhaustion, because the body is gearing up to survive, and reproductive hormones are less important. Sex drive is reduced in both men and women.

We will have much more to say about hormonal system imbalances later. Clearly, in this phase, many of the hormonal systems are way off normal function, including the critical HPA axis, but symptoms are subclinical and relatively mild. More often than not, conventional medical workups remain negative, that is, produce findings in the normal range.

**Dysfunction in Immune Mediated Conditions**

When the adrenals are overtaxed, the immune system is unable to function optimally. As a result, we often see exaggerated autoimmune or what are known as immune mediated responses such as:

- rheumatoid arthritis (RA)
- Hashimoto’s thyroiditis
- allergic rhinitis (nasal inflammation not associated with the common cold)
- skin sensitivities, including psoriasis (a chronic condition marked by scaly, red patches)
- hypoactive (lowered) immune function
- frequent infections
- internal dysbiosis (imbalance in intestinal flora)
- candidiasis (fungal infections)
- recurrent herpes infections

While their onset may begin in Stage 3A and are mild and subclinical in nature, these can become full blown medical conditions by the time AFS reaches Stage 3C or 3D.
**Allergies:** Allergic reactions usually have strong adrenal components. Most allergies involve the release of histamine and other pro-inflammatory substances. To counteract this, the body releases cortisol, a strong anti-inflammatory hormone. The level of circulating cortisol correlates directly to the degree of inflammation in the body and the resulting symptoms of allergies. The weaker the adrenals, the stronger the effects of allergies because more histamine is released. It then takes more cortisol to control the inflammatory response and the adrenals need to work even harder to produce cortisol.

When the adrenals are exhausted, cortisol output is compromised, allowing unopposed histamine to further inflame the tissues. This vicious cycle can lead to progressively deepening adrenal exhaustion and more severe allergic reactions. People with food and environmental allergies often have weak adrenal function. (We explore this in great detail in Chapter 25, *Food and Chemical Sensitivities*). Suffice it to say that Stage 3A is where many of these symptoms start surfacing.

**Autoimmune Disease:** Autoimmune diseases, such as Hashimoto’s disease or rheumatoid arthritis, represent a spectrum of diseases in which the white blood cells of the immune system become overactive. Chemical messengers called cytokines form an integral part of the immune system, and as messengers, cytokines inform and trigger other immune cells to activate, grow, or possibly die. Excessive pro-inflammatory cytokines are elevated in fibromyalgia and chronic fatigue, leading to aggravated inflammation and flu-like symptoms. Chronic inflammation can reflect an improperly functioning immune system.

Anti-inflammatory effects of cortisol restrain various physiological mechanisms in order to prevent them from causing havoc inside the body, which is what occurs when an autoimmune disease is present and over-reactive white blood cells secrete toxins and exacerbate the condition. In this way, cortisol protects the body from autoimmune processes and uncontrolled inflammation. We see insufficient levels of cortisol in people with advanced Adrenal Fatigue Syndrome, resulting in compromised and overactive white blood cells that lead to unrestrained damage to the body.

**Infections:** Chronic infections of all kinds are often the root cause of Adrenal Fatigue Syndrome and tend to predispose individuals to developing respiratory problems. Symptoms of Lyme disease and H. Pylori infection, in particular, can mimic AFS. Recurrent respiratory infections and delayed healing also add to the difficulty of recovering from Adrenal Fatigue Syndrome. Even a single infection can trigger AFS. Both chronic infections and acute infections, such as pneumonia, are...
triggers of AFS. Be especially careful about dental procedures that are incomplete or poorly performed which can serve as a source of toxins in the body.

Commonly overlooked chronic infections include viruses that lurk in the body and do not produce symptoms. Parasites and fungi also do their damage silently, but over time, the stress they cause chronically overloads the adrenals and weakens the body’s immune system. This cascade of processes that weakens immunity makes it harder to fight off the infection. Therefore, it follows that Adrenal Exhaustion is commonly associated with frequent and repeated infections with slower than normal healing times. We must consider adrenal dysfunction if we see a longer than normal recovery period after an illness or flu, with decreased stamina and pronounced morning fatigue.

Unfortunately, the temptation to treat symptoms is great in order to provide immediate relief. This often leads to excessive prescription of antibiotics and medications rather than allowing the body to heal itself.

As Adrenal Fatigue Syndrome progresses, more and more of the body’s systems become involved. Confusion is normal. Sufferers end up being treated for a variety of symptoms that are mistakenly taken as disease.

**How You Know You Are in Stage 3A**

As you can see, most symptoms of Stage 3A tend to be mild. Whether it is occasional brain fog, mild food sensitivities, intermittent hypoglycemia, salt cravings, or dizziness on arising, they are invariably overlooked until well past this phase and only become obvious in retrospect. That is why this phase can be so destructive to our overall health. Our central control has already been infiltrated by enemy forces. But alarm bells have been rung if one only listens carefully.

Stage 3A usually goes on for many years unnoticed. Extensive medical workups are invariably normal. Those who pay attention to their body know something is wrong, but they remain entwined in cognitive dissonance as they are told all is well. Most people in this circumstance tend to be confused.

If Stage 3A is not reversed, continued deterioration is the natural progression of AFS. Hormonal axes are the main conduits of maintaining internal well-being within the command center of our body. These axes begin losing their integrity—stability and predictability—as we enter Phase B of Stage 3. We examine that in the next chapter.
Key Points to Remember

• As AFS progresses, early clinical signs of organ system dysfunction are evident. This is usually when patients go see their physician for the first time.

• Symptoms of Stage 3A are associated closely to HPA axis dysregulation.

• Metabolic system dysfunction and imbalance leads to the onset of mild hypoglycemia. Low blood pressure and salt cravings reflect aldosterone deficiency. Both are signs of HPA axis dysregulation. Dysfunction in detoxification pathways, primarily in the liver, leads to a low clearance state, causing numerous symptoms from brain fog to hypoglycemia.

• Musculoskeletal system dysfunction leads to onset of joint and muscular pain of unknown origin as the body enters a catabolic state.

• Neurological system dysfunction leads to worsening insomnia, tremor, anxiety, and depression.

• Hormonal system dysfunction and imbalances lead to the onset of subclinical hypothyroidism, PMS, PCOS, and endometriosis.

• Immune system dysfunction leads to recurrent infection and yeast overgrowth, with exaggerated autoimmune response at times.

• The body is losing its ability to perform normally, but the symptoms are so mild they are invariably overlooked.
Chapter 4

Stage 3B—Hormonal Axes Imbalances

In the previous chapter, it was revealed that many Stage 3A symptoms, such as hypoglycemia and low blood pressure, are consistent with dysregulation of the HPA hormonal axis. This upstream axis is particularly important because it bridges the brain to the adrenal gland. Dysfunction of this axis serves as a warning sign that the worst is yet to come if AFS is allowed to progress. As AFS worsens to Stage 3B, downstream hormonal axes become dysregulated. Imbalances of such axes are the hallmarks of stage 3B Adrenal Fatigue Syndrome.

In women, the axis involved is called the ovarian-adrenal-axis (OAT); in men, it's called the adrenal-thyroid (AT) axis.

Although we generally focus on the OAT axis, both women and men will find that this chapter is the foundation that supports your overall understanding of Adrenal Exhaustion.

The OAT Axis

In Chapter 2, Stress, Hormone Basics, and the “Forgotten” Adrenals, we discussed the HPA axis and HPG axis, which are important regulators of stress and menses respectively. In Adrenal Exhaustion, another axis dysregulates. This axis ties together the ovaries, adrenals, and the thyroid gland, hence the term ovarian-adrenal-thyroid (OAT) axis. The diagram below shows how the HPG, HPA and OAT axes are interconnected.

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Figure 7. Relation between HPG, HPA and OAT Hormonal Axes
What happens to one organ of the three affects the other organs physiologically, clinically or subclinically. This makes these three organs hormonally interdependent. For example, if adrenals are weak, we often see concurrent thyroid malfunction and menstrual cycle irregularity. An underactive thyroid often aggravates adrenal weakness. Likewise, ovarian hormonal imbalances, such as estrogen dominance, often exacerbate any preexisting subclinical or clinical hypothyroidism.

We can liken the OAT axis to a three-legged stool; it isn’t safe to sit unless all three legs are in perfect balance. So, for women to feel their best, all three organs in the OAT axis must be in harmony. Imbalances within the OAT axis lead to a variety of conditions. When mild, the conditions are bothersome and perhaps annoying, but when severe, they are incapacitating.

Symptoms of OAT axis imbalance often suggest concurrent estrogen dominance (ovarian), fatigue (adrenal), and hypothyroidism (thyroid). Because the symptoms overlap within the three organ systems, groups or clusters of symptoms can be very misleading. Consider this array of symptoms: insomnia, fatigue, myalgia, weight gain, joint pain, exercise intolerance, brain fog, sugar intolerance, diabetes, dry skin, feeling cold, slow metabolism, inability to lose weight, PMS, endometriosis, irregular menstrual cycle, fibrocystic breast disease, anxiety, depression, and accumulation of fat at the waist line. Hormonally, many are low in cortisol, progesterone, and thyroid. They appear clinically convoluted because the onset is simultaneous.

As you can see, these symptoms are linked to a variety of diseases. Many individuals are treated for thyroid problems alone. Some are evaluated for both ovarian and thyroid problems. However, few healthcare practitioners pay attention to the entire triad of ovarian, adrenal, and thyroid dysfunction.

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**Note:** Women whose ovaries have been removed can still have OAT axis imbalances; imbalances in estrogen are involved and the ovaries are not the only place where estrogen is produced. The adrenal glands, as well as fat cells (adipose tissue), also produce estrogen. Therefore, those who are constantly stressed as well as overweight are particularly at risk.

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OAT axis imbalance is not well researched, but we know it involves a clinical convolution of multiple hormonal axes imbalances. Unfortunately, no definitive test can isolate and identify this imbalanced state with pinpoint accuracy. At this point, what we do understand comes primarily from clinical experiences and case studies.
We view OAT axis imbalances as a clinical state, not as a disease state. The clinical state unifies common imbalances of the ovarian, adrenal, and thyroid systems into a triad. To better understand the OAT axis, we first look at key hormonal actions of the ovaries, adrenals, and thyroid glands individually, and we explain the way they affect each other.

**Ovarian Hormones: Estrogen and Progesterone**

You likely know that the ovaries regulate two sex hormones: estrogen and its opposing hormone *progesterone*, with the following features:

- Estrogen is produced by the ovaries, egg follicles, the adrenal glands, and in fat cells.
- Progesterone is produced almost entirely by the corpus luteum, which is the small mass of fat cells left over from the follicle after the egg leaves it at ovulation.

Progesterone acts as the *antagonist* to estrogen, meaning it balances and opposes the actions of estrogen. For example, estrogen stimulates the formation and growth of breast cysts, but progesterone is on the job to protect against breast cysts. Estrogen enhances salt and water retention, but progesterone acts as a natural diuretic. Estrogen has been associated with breast and endometrial cancers, while, generally speaking, progesterone has a cancer protective effect. (The endometrium is the mucous membrane that lines the uterus.) Women need both hormones to achieve optimum function. For example, progesterone does not do its job effectively without some estrogen in the body to “prime the pump.”

The table below clarifies the balancing functions of each hormone:

<table>
<thead>
<tr>
<th>Estrogen Effect</th>
<th>Progesterone Effect</th>
</tr>
</thead>
<tbody>
<tr>
<td>Causes endometrium to proliferate</td>
<td>Maintains secretory endometrium</td>
</tr>
<tr>
<td>Causes breast stimulation that can lead to breast cancer</td>
<td>Protects against fibrocystic breast prevents breast cancer</td>
</tr>
<tr>
<td>Increases body fat</td>
<td>Helps use fat for energy</td>
</tr>
<tr>
<td>Increases endometrial cancer risk</td>
<td>Prevents endometrial cancer</td>
</tr>
<tr>
<td>Reduces vascular tone</td>
<td>Restores vascular tone</td>
</tr>
<tr>
<td>Increases blood clot risk</td>
<td>Normalizes blood clotting</td>
</tr>
</tbody>
</table>
As you can see from the table above, estrogen and progesterone act as checks and balances in order to achieve hormonal harmony. The relative dominance of estrogen and relative deficiency of progesterone leading to a state of estrogen dominance is the main culprit in the ovarian portion of the OAT axis imbalance.

**Estrogen Dominance (Progesterone Deficiency)**

Sex hormones, such as estrogen and progesterone, gradually decline with age, but we see a drastic change in the rate of decline during the perimenopausal and menopausal years. For example, from ages thirty-five to fifty, women experience a 75 percent reduction in progesterone production; in the same period, estrogen declines by about 35 percent. By menopause, women's bodies produce very little progesterone, but estrogen is present at about half its premenopausal level. Hence, we see a state called estrogen dominance. In other words, the body is bathed in a sea of estrogen because there is insufficient progesterone to offset it. This has serious pathological effects. The estrogen load is also exacerbated by stress and environmental factors, so the state of estrogen dominance adversely affects millions of healthy women from about the mid-thirties and up. Those who are exposed to excessive weight gain and stress may be afflicted much earlier, starting from late young adulthood. Men are also affected due to excessive environmental estrogen, though at a reduced intensity.

This phenomenon is illustrated in the graph below:

![Graph showing estrogen and progesterone production as a function of age](www.DrLam.com)

*Figure 8. Estrogen and Progesterone Production as a Function of Age*
Other factors contributing to estrogen dominance include excessive environmental estrogen, obesity, stress, poor diet, lack of exercise, and unopposed estrogen given as part of natural or synthetic hormone replacement therapy (HRT). In addition, an underactive thyroid can worsen the symptoms of estrogen dominance. AFS is also a commonly overlooked reason. Recall that pregnenolone is the precursor to progesterone. As AFS progresses, progesterone output can be reduced, which can then worsen estrogen dominance.

**Symptoms of Estrogen Dominance**

Women suffering from estrogen dominance typically experience some or even all of the following:

- swollen breasts and ring fingers
- impatience and irritability
- cramps before the menstrual cycle
- irregular periods
- fluid retention
- foggy thinking
- depression
- fatigue

These symptoms form the underlying common denominator for a variety of illnesses and syndromes previously regarded as unrelated entities. However, they represent different expressions of the same illness affecting different organs and body systems. If we put a lifetime of excessive estrogen on a continuum, then we might see the following manifestations at different times, starting with:

- **Premenstrual syndrome (PMS).** With numerous physical and psychological symptoms, such as abdominal pain, water retention, headaches, food cravings, irritability, and so forth.

- **Endometriosis.** A condition in which cells from the endometrium (the lining of the uterus) travel outside the uterus and attach to other pelvic organs. In addition to being a painful condition, endometriosis is a leading cause of infertility.

- **PCOS (polycystic ovary syndrome).** A hormonal imbalance that leads to irregular menstrual periods or lack of menstruation, along with
other symptoms such as weight gain, diabetes, metabolic syndrome, and infertility.

- **Fibrocystic breast disease.** Fluid filled cysts developing in the breasts.
- **Fibroids.** Benign tumors that grow on the uterine wall and, if large, cause heavy menstrual bleeding and menstrual pain.
- **Breast cancer.** Malignant growths in the breast tissue.

## Estrogen Dominance and Adrenal Fatigue Syndrome

Most women in Stage 3B AFS (or higher) suffer from estrogen dominance to varying degrees. Because treatments commonly focus on rebalancing estrogen, the root cause of adrenal weakness is easily missed. Because estrogen deficiency and estrogen dominance can have similar symptoms, such as hot flashes and PMS, some are prescribed estrogen replacement, which, in effect, increases the already high estrogen load in the body. While the initial clinical response may be positive for the lucky few, this approach invariably fails over time as Adrenal Fatigue Syndrome worsens.

The key is to focus on the adrenals first whenever clinically possible, as symptoms of estrogen dominance tend to subside when optimum adrenal health returns. If this is not possible, as sometimes happens when ovarian symptoms are overwhelming and demand immediate attention, proper balancing between ovarian and adrenal restoration is necessary. Long term, focusing only on rebalancing the ovarian hormones without concurrent adrenal support, increases the risk of recovery failure.

Remember that estrogen dominance is simply another way of saying progesterone deficiency on a relative basis. Low progesterone levels also occur in anovulatory cycles (menstrual cycles in which ovulation does not take place). In the presence of Adrenal Fatigue Syndrome, the body’s emergency repair system is activated, however, and the body’s priority is stabilizing basic bodily functions, such as blood pressure and blood sugar. In times of scarcity or stress, reproductive functions are considered low priority and ovulation might temporarily shut down. Women living under high stress conditions often experience irregular menstrual cycles or even the absence of their cycles (amenorrhea). In the absence of ovulation, the body doesn’t produce additional progesterone for the cycle. Again, here, lower progesterone levels mean estrogen is higher and the hormonal orchestra is out of harmony.

Estrogen dominance can also be caused by excessive stimulation of estrogen through other sources. As adrenal weakness progresses, most individuals gain weight as the metabolism slows to conserve energy and food intake increases due to the cortisol...
effect in the brain (discussed in Chapter 5, *Early Adrenal Fatigue Syndrome: Stages 1 and 2*). When this happens, excessive fat cells accumulate, leading to an increased output of estrogen, thereby worsening any preexisting estrogen dominance. However, this is not the case by Stage 3D, a point at which most individuals lose weight.

Almost everyone is exposed to environmental estrogen-like compounds known as xenoestrogen, or you may hear the term *exogenous estrogen*. This is a relatively new phenomenon, starting primarily after World War II when the plastic and chemical revolution began and environmental effects soon appeared. These external estrogens are found in products containing chemicals that mimic estrogen. For example, many plastic products contain chemicals that enter the food chain when microwaving food in plastic dishes or using plastic wraps and containers. These xenoestrogens may also leach from cheaply produced soft plastic used in bottled water. Estrogen-like compounds can also come from certain foods, like cruciferous vegetables and unfermented soy products such as tofu. Chronic build up can worsen estrogen dominance, which in turn worsens Adrenal Fatigue Syndrome.

Clearly, excessive estrogen is to be avoided at all cost under normal conditions. This is even more critical in Adrenal Fatigue Syndrome.

**Estrogen Dominance and the OAT Axis**

In addition to the conditions above, estrogen dominance shows itself in ways that are not obvious, particularly because it influences the other organs in the axis. Consider the following:

- **Estrogen dominance may increase thyroid binding proteins in the bloodstream.** Thyroid hormones are trapped in protein and less available to the cells where it is needed. This means that total thyroid blood testing may show normal, but the tissues may be insufficient in free thyroid hormone, resulting in subclinical or clinical hypothyroidism.

- **When estrogen levels are high, the adrenal cortex fails to respond to signals from the brain.** In other words, the brain might send a signal to produce more cortisol, but the adrenal response is blunted. As a result, cortisol output is suboptimal relative to the demand signal. Estrogen also impairs adrenal function by interfering with the release of cortisol from the adrenal cortex. High levels of estrogen can lead to a corresponding increase in the level of cortisol-binding globulin (proteins), which, in turn, interferes with hormonal functions and circulates in the bloodstream, binding to cortisol, and rendering it inactive.
A woman with estrogen dominance may have adequate levels of total cortisol in her bloodstream, so testing the cortisol level in the blood may render results well within the normal range. However, her free (available) cortisol level may be low. Since only free cortisol can activate receptors inside the cells, the effectiveness of cortisol is blunted at the cellular level.

*Pat (age 55) in her own words:*

Looking back, I experienced so many symptoms that I know identify as part of Adrenal Fatigue Syndrome. Even as a young woman, I suffered severe menstrual cramps. In my thirties, PMS symptoms became difficult to cope with. I’m a nurse, and even with medical training I didn’t understand what was causing these problems. I ended up using over-the-counter PMS products, including vitamin supplements, but the bloating, sugar cravings, and breast tenderness continued to get worse.

Then, in my late thirties, I was diagnosed with large uterine fibroids along with thickened endometrial lining. When my doctor recommended a hysterectomy, I agreed to have the surgery. I experienced such heavy bleeding and irregular periods which had become another issue to cope with. Today, looking back, I regret not having more information, because if I’d known more I wouldn’t have had the surgery, although I do still have my ovaries.

After the surgery I went through years of hot flashes, and I gained weight in my abdomen. Then my hair began thinning, too, and I had heart palpitations. I also lost my sex drive and had vaginal dryness. All this and a sense of apathy left me with a poor quality of life.

In my early fifties, I went through menopause, which meant I had post-menopausal levels of estrogen and progesterone, measured with several saliva tests. I used hormone creams off and on for quite a long time, but they didn’t make much difference in how I felt—which was pretty awful most of the time.

Through these years I began to feel more and more tired and, ironically, I didn’t sleep well either. It was no wonder I was depressed. For a time, I wondered if I could manage to keep working. A friend told me about Adrenal Fatigue Syndrome, and I did my own research. It was disturbing to learn how little information exists within the conventional medical world. I believe my doctors, and I saw a few, were well intentioned, but they offered treatments within their range of knowledge. This was too narrow, and I believe my symptoms were treated as “women’s” problems, when I now understand they were related to
estrogen dominance and imbalance in the OAT axis. I didn't learn that in nursing school. I made those connections when I worked with Dr. Lam and started a personalized nutritional recovery program. Today, I can trace my symptoms and AFS back to my twenties, but I also feel as if I've discovered a healthy way to live over the next phase of my life.

A Two-way Street

Just as estrogen dominance can contribute to Adrenal Fatigue Syndrome, the reverse is also true. Cortisol is made in the adrenal cortex from progesterone, and when the adrenals are weak, we see a tendency in favor of cortisol production. If the progesterone level falls, a state of relative estrogen dominance develops. This situation creates an adverse feedback loop and in everyday terms, a vicious cycle. Excessive estrogen adversely affects both thyroid and adrenal function, and, in turn, thyroid dysfunction and Adrenal Fatigue Syndrome make estrogen dominance worse.

Progesterone Deficiency and Pregnancy

Pregnancy is impossible unless sufficient progesterone is present to provide a supportive environment for the egg in the uterus throughout the gestation period. Those in Stage 3B are particularly at risk, especially if estrogen dominance exists. Even if pregnancy is achieved, frequent miscarriages occur during the first trimester. This is the time when the need for progesterone increases.

Women with severe OAT axis imbalance are invariably unable to meet this need on a sustained basis. Resulting miscarriages usually occur in the late first trimester. Those who experience serial miscarriages should therefore be on the alert for AFS and progesterone deficiency. Fortunately, this is reversible in most cases. As adrenal function is optimized, many find themselves able to regain normal pregnancy. A frequent clinical oversight is the failure to consider AFS as a possible cause of serial miscarriages among those who have a history of high stress.

Adrenals and the OAT Axis Imbalance

The adrenal glands are usually the first of the endocrine functions to break down when stress has overwhelmed the body's normal compensatory response. Unfortunately, this is seldom recognized early on as a pathological state. Individuals
use socially acceptable actions to compensate for feeling tired or otherwise off. For example, increasing coffee intake often masks the underlying problem as the adrenals are put in overdrive to cover up the early signs and symptoms of Adrenal Fatigue Syndrome—and this can go on for years.

The next endocrine gland to be affected is the insulin producing portion of the pancreas. Then, blood sugar becomes imbalanced and this dysfunction is temporarily fixed by drinking sodas or various energy boosting concoctions or by eating pastries and other sweets.

The thyroid follows the pancreas. Sluggishness, feeling cold most of the time, and weight gain are the predominant symptoms that bring patients to their physicians. This is often when hypothyroidism is first diagnosed. Physicians then routinely prescribe thyroid replacement medication. However, over time, many patients taking thyroid medications remain symptomatic. Along with hypothyroidism, we see symptoms of estrogen dominance. Symptoms include PMS, endometriosis, lumpy breasts (fibrocystic changes), and irregular menstrual cycles. Hormone replacement medication may work short term, but unless the adrenals are first attended to, the patient’s response is often blunted and ultimately fails.

Finally, as the body advances toward Stage 3D, the parathyroid glands, the pineal gland, the autonomic nervous system (ANS) and the hypothalamus become affected. By this time, the OAT axis is severely imbalanced.

In Stage 3B, the many symptoms of adrenal dysregulation such as hypoglycemia and low blood pressure characteristic of Stage 3A progressively worsen. Much of this is due to the continued dysregulation of the HPA axis and cortisol dysregulation. As the adrenal function is compromised, estrogen dominance increases, and thyroid function worsens.

The Picture of Hypothyroidism

The thyroid gland, which sits at the front of the neck just below the larynx (voice box), acts as the body's metabolic barometer and helps cells convert oxygen and calories into energy. It is responsible for regulating heart rate, blood pressure, body temperature, metabolism, and growth.

Thyroid 101

To explain thyroid function simply, just remember that control starts at the pituitary gland with the release of thyroid stimulating hormone (TSH). TSH signals the thyroid gland to secrete a hormone called T4 (thyroxine). T4 in turn becomes T3
(triiodothyronine) or Reverse T3 (RT3). T3 then causes the cells to generate energy in the form of ATP (adenosine triphosphate, a compound that supplies large amounts of energy to the cells).

T3 is responsible for most of the biological activity of thyroid hormones. It has a higher affinity for thyroid receptors and is much more potent than T4. RT3 acts as a braking system to T3. Not only is RT3 inactive, it binds to T3 receptors and blocks the action of T3. T4 should be considered a precursor to T3 and RT3.

A properly functioning thyroid gland requires a perfect balance of T4, T3, and RT3. The normal production ratio of T4 to T3 is 3.3:1.

Causes and Symptoms of Hypothyroidism

A variety of factors can contribute to the development of thyroid problems. These include:

- exposure to external environmental radiation
- radioactive iodine used for treatment of hyperthyroidism (overactive thyroid)
- special X-ray dyes
- drugs such as lithium that have anti-thyroid effects
- overconsumption of uncooked goitrogenic foods, such as broccoli, turnips, radishes, cauliflower, unfermented soy such as tofu and soy milk, and Brussels sprouts
- mercury toxicity (dental amalgams are 50 percent mercury)
- autoimmune diseases
- infection
- brain tumors

Low thyroid function generates a global or whole body response. Symptoms include:

- Fatigue and low energy with a need for daytime naps, which is caused by a defect in cellular energy conversion and difficulty in converting from T4 to T3.
• Skin that becomes dry, scaly, rough, and cold because of increased demands on metabolism, such as cold weather, with little thyroid reserve.

• Excessive unexplained hair loss due to slowing down of cell turnover and tissue/hair production.

• Sensitivity to cold in a room when others are warm, which is caused by sluggish conversion of nutrients and oxygen to heat.

• Memory impairment and/or depression due to inadequate levels of thyroid in the brain.

• Constipation that is resistant to magnesium supplementation.

• Unexplained weight gain due to reduced metabolism, which enlarges fat cells that sequester T4, causing depletion and further sluggishness.

• High cholesterol which is resistant to cholesterol lowering drugs.

• Low libido, PMS, miscarriage, and infertility, which are linked to the disruption of testosterone, estrogen, and progesterone.

• Abdominal cramping and irritable bowel syndrome (IBS) caused by reduced muscular activity of the bowel wall due to thyroid depletion.

As you can see, thyroid gland dysfunction can be linked to many of the most common health complaints, but that link—the underlying cause of many symptoms—is often missed. This is not an uncommon situation.

**Thyroid Laboratory Tests**

• The most important tests of thyroid function are TSH, free T4, and free T3. Free T4 and free T3 measures the biologically active (free) forms of T4 and T3 respectively. As compared to total T4 and total T3, free T4 and free T3 measure the quantity of T4 and T3 that is not bound to the blood proteins and are thus most biologically available. Normal laboratory range is 0.8-1.8 ng/L for free T4, 2.3-4.2 pg/ml for free T3, and 90-350 pg/ml for RT3.

• TSH testing reflects the blood level of TSH. The *standard reference range* for adults is between 0.5 to 5.0 µIU/mL (equivalent to mIU/L) historically. A high number means the thyroid is hard at work, thus a sign of low thyroid function. Conversely, a low number means that the thyroid is working hard, or hyperthyroid. The typical reference was changed to 0.3 to 3.0 µIU/mL in recent years to reflect a growing consensus among endocrinologists that
many suffer from mild hypothyroid disorder. It was unrecognized due to an upper limit of TSH, based on epidemiological data, that was too liberal. The therapeutic target range TSH level for patients on treatment ranges between 0.3 to 3.0 µIU/mL. The interpretation depends also on what the blood levels of thyroid hormones (T3 and T4) are.

**Primary vs. Secondary Hypothyroidism**

*Hypothyroidism*, or low functioning thyroid, can be *primary*, which means first in order of development, or *secondary*, which develops as a result of changing conditions in other parts of the body.

Primary hypothyroidism means that the thyroid cannot make the hormones T3 and T4 because of a problem with the gland itself. In the U.S., the most common cause is destruction of the thyroid gland by the immune system. This condition is called Hashimoto’s thyroiditis. Treatment usually involves thyroid replacement therapy. Primary hypothyroidism can also be caused by surgical removal of the thyroid gland, which is then followed by inadequate thyroid replacement therapy. In primary hypothyroidism, TSH is usually high. However, if hypothyroid symptoms, such as low body temperature, fatigue, dry skin, and weight gain persist, despite thyroid replacement therapy and regardless of laboratory test results, we must look elsewhere for the cause of low thyroid function.

Secondary hypothyroidism is commonly thought to be linked with issues involving the pituitary gland, hypothalamus, and/or medications such as dopamine and lithium. In recent decades, we also include what is known as non-thyroid illness syndrome (NTIS). In this situation, patients have physical signs of hypothyroidism but do not have structural problems with the thyroid gland, and the TSH is normal. For example, in those suffering from *anorexia nervosa* (an eating disorder), the thyroid dysfunction has metabolic causes that do not fit the criteria for classic hypothyroidism as defined by endocrinologists. Treatment is usually directed toward the underlying cause, and steroid replacement is usually employed in addition to surgery as needed.

Adrenal Fatigue Syndrome perhaps is a common but frequently overlooked and unrecognized condition, closely associated with and possibly a cause of secondary clinical and subclinical hypothyroidism. Thyroid test results in advanced AFS usually show normal or low free T4 and free T3. TSH can be normal or high, but body temperature is generally low consistently. Fortunately, such secondary hypothyroidism can be reversed if indeed AFS is the cause. We see many with Adrenal Fatigue Syndrome who are on thyroid medication reduce their thyroid medicine as their adrenal health improves.
Hashimoto’s Thyroiditis and AFS

Hashimoto’s thyroiditis is a common autoimmune condition in which individuals develop an allergy toward their thyroid gland. Thyroid gland destruction and spillage of T4 early on in the disease can lead to symptoms and the state of hyperthyroidism, which stresses the adrenal glands, contributing to AFS. As a compensatory reaction, the pituitary releases less TSH in order to slow down thyroid hormone production. When enough destruction has occurred, thyroid production ultimately goes down, and the person then enters the hypothyroid phase. At this time, both adrenal and thyroid function becomes compromised. Anti-thyroglobulin antibodies (ATA), autoimmune antibodies, and thyroid peroxidase antibodies (TPO) are invariably present in blood tests. In early stages, we see low TSH, high free T3 and free T4. In late stages, we see normal or high TSH, low free T3, and low free T4.

Grave’s disease is an autoimmune disease in which an antibody is produced that mimics the action of TSH. As a result, the thyroid gland is put on overdrive to make T4. As the T4 level rises, the pituitary compensates and tries to reduce the T4 level by reducing TSH output. Typically, we find elevation of thyroid stimulating immunoglobulin or TSI, high free T3 and free T4. Needless to say, the adrenals are extremely stressed with this type of rollercoaster ride.

As you can see, Adrenal Fatigue Syndrome only worsens if you have Hashimoto’s thyroiditis or Grave’s disease.

How the Thyroid Affects Other Hormones

Thyroid hormone imbalance is perhaps the single most confusing and difficult to manage of all endocrine disorders. In addition to the already complex clinical picture, treatment errors are common if the intricate OAT axis involvement is not clearly understood.

Because the thyroid regulates metabolism, it also influences the reproductive glands. For example, the thyroid influences the menstrual cycle and fertility because of its role in producing SHBG (sex hormone binding globulin), prolactin (a pituitary hormone), and GnRH (gonadotropin releasing hormone, produced in the hypothalamus). All these hormones influence the menstrual cycle and fertility. Thyroid hormones also stimulate progesterone production in the ovaries. For example, women in childbearing years who suffer from PCOS and infertility problems usually have chronically low progesterone. Untreated thyroid problems could be behind the inadequate progesterone production, and, therefore, a contributing factor in a woman’s infertility. When hypothyroidism is resolved, women often spontaneously overcome infertility problems.
Likewise, thyroid abnormalities influence PMS and symptoms of menopause. It is clear that thyroid function and estrogen dominance are closely linked. Iodine, a key supportive compound for the thyroid, is one of the best natural cures for fibrocystic breast diseases, a symptom of estrogen dominance.

In addition, thyroid hormones have similarities with certain metabolites of estrogen and progesterone. Estrogen and progesterone can block or facilitate receptor sites for thyroid hormones. In practical terms, this means that imbalances of thyroid hormones T3 and T4, combined with imbalances of estrogen and progesterone, can mimic symptoms of menopause. For example, women may notice sleep disturbances, mood issues, fluid retention, body temperature issues, and reduced energy. Then, based on books or articles they’ve read or TV health segments they’ve watched, they likely believe they are approaching menopause. Testing might show normal TSH values, but these women could be in a state of subclinical hypothyroidism and not know it.

Are You Hypothyroid?

Classic symptoms of thyroid dysfunction for both women and men include fatigue, dry skin, weight gain, low body temperature, and insomnia. Given these symptoms, physicians generally order lab tests to measure thyroid function. We recommend tests measuring TSH, free T4, and free T3 tests.

Results typically show:

• normal or high TSH (thyroid stimulating hormone);
• normal or low T3 and free T3 (triiodothyronine); and
• normal or low T4 and free T4 (thyroxine).

Because the range of results can be wide, laboratory tests are typically inconclusive. Clinicians lean toward a bias of diagnosing hypothyroidism if clinical symptoms are consistent with low metabolism and reduced energy output. Typically, thyroid replacement medications are then prescribed, which should bring about improvement if indeed the thyroid gland is malfunctioning.

When Thyroid Replacement is Ill Advised

We often see TSH, T4, and T3 testing in the normal range, but at the same time, the person has classic symptoms of hypothyroidism such as weight gain and fatigue. Alternatively, test results of free T4 and free T3 may be low while TSH is normal or high. Many are started on thyroid replacement medication based on symptoms alone. This is a common conventional medicine practice.

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In both scenarios, thyroid replacement with T4 and T3 without first considering adrenal involvement is a common pitfall and often aggravates the OAT axis imbalance. The reason is simple: Thyroid replacement tends to increase metabolic function, which is akin to putting all systems of the body into overdrive at a time when the body is trying to rest through the down regulation mechanisms. The body wants to slow down, but the medications are designed to speed it up.

In the case of advanced Adrenal Fatigue Syndrome, taking thyroid medication without concurrent attention to adrenal recovery often is analogous to pouring oil onto a fire. An already weak adrenal system may not be able to carry the burden of extra energy output. This confusing situation is made worse because thyroid medication may lead to a temporary boost of energy and improvement of other symptoms.

Fatigue usually returns over time, because the thyroid medication further undermines the preexisting adrenal weakness and often precipitates adrenal crisis. Moreover, the fatigue increases well beyond what the thyroid medication is trying to combat. Rather than stepping back and considering that other hormonal issues may be involved, specifically, adrenal hormones, it is tempting to increase the medication dosage or switch to more powerful thyroid medication. Again, this boosts energy and relieves symptoms temporarily, but does not address the underlying problem.

Meanwhile, once patients take thyroid medications, lab tests of T4, T3, and TSH might show improvement, but the individuals don’t feel better and many actually feel worse. As stated earlier, many on thyroid replacement medications continue to complain of unresolved symptoms. Sufferers and clinicians alike are easily misled by what look like improving lab test results, and they may assume that the therapy is on the right track.

When symptoms fail to improve, we see a tendency to switch from one medication to another. Physicians may start with synthetic T4, to T4/T3 blends, and ultimately, to potent T3. It’s all a matter of trial and error, but meanwhile, the patient often continues to get worse. Sometimes, adverse side effects of the medications, such as heart palpitations and tremors, surface as dosages increase and the patient continues to feel fatigued and sluggish. We call this state being “wired and tired,” the worst of both worlds. Being “wired and tired” occurs too frequently and just as often goes unnoted.

Then, as physicians run out of options to control symptoms, they often prescribe antidepressants. These drugs seldom work in the long run in this situation. Rather, they often make the OAT imbalance worse. These solutions do not address the reality that adrenal function plays a key role in this imbalance.
Focus on the Adrenals when Thyroid Replacement Fails

Clinicians should be on the alert that if symptoms of hypothyroidism fail to resolve, or if an ever increasing dose of thyroid medicine is necessary, AFS should be considered. When the adrenals are weak, nearly all other hormone regulated organs are affected, including the ovaries, the thyroid, and the pancreas. Put another way, in the presence of Adrenal Fatigue Syndrome, few hormones are allowed to work at their optimal levels, and that includes thyroid, insulin (produced by the pancreas), cortisol, progesterone, estrogen, and testosterone. When the adrenals are weak, the normal negative feedback loop is compromised and carrier hormones in the blood can be disrupted, which compromises the ability of each hormone to regulate and fine tune its target organ to achieve homeostasis. That might sound abstract, but this multiple hormone disruption can lead to noticeable, distressing symptoms.

The more complaints the sufferers make, the more they end up being treated for symptoms of Stage 3A, or for the weak thyroid and ovarian systems’ dysfunction of Stage 3B, while the most important component, adrenal dysfunction, is ignored. This is the case with most healthy individuals seeing their doctor for fatigue and lethargy.

Those who are concurrently chronically ill fare even worse. Their adrenal functions are invariably already compromised due to preexisting conditions, such as diabetes and heart disease, just to name a few. Concurrent low adrenal and thyroid function is the clinical norm. Generally speaking, problems with adrenal function are not considered or investigated, and the focus appears to be on low thyroid function, either by symptoms alone or a combination of symptoms and abnormal laboratory test results.

The recovery process is best served by supporting the adrenal glands before raising the thyroid hormone.

Again, increased circulation of the thyroid hormone often further strains the already weak adrenal glands, leading to adrenal crashes and further decompensation.

Therefore, this thyroid-only treatment does not consider the axis imbalance and so not only fails, but might make the condition worse. Conversely, an approach focusing on adrenals first often leads to spectacular results, with the ovarian and thyroid hormones rebalancing themselves as the adrenal glands recover.
If the situation described here sounds similar to what you or someone you know is experiencing, then it goes without saying that you should investigate Adrenal Fatigue Syndrome as a possible cause of your thyroid problem. The good news is that as adrenal function normalizes, those erroneously placed on thyroid replacement invariably find they need less medication. Some may not need thyroid replacement at all as their AFS improves. Those who continue to take thyroid medicine as the adrenal recovers need to be careful to avoid being overmedicated and thus run the risk of hyperthyroidism. The ability to reduce thyroid medication represents a good gauge of improvement in adrenal function, and the credit goes to the adrenal glands, not the thyroid gland. In improving adrenal health, the need for down-regulation subsides and thyroid function suppression is lifted, leading the way to normalizing thyroid function.

Caution: Do not abruptly discontinue thyroid medications (and other natural compounds that may have stimulatory effects such as herbs and glandulars) without professional guidance. You could experience unpleasant, even intolerable, withdrawal symptoms. In rare cases, adrenal crisis may be precipitated.

Sometimes patients improve, but their lab test results lag behind. For example, free T3 and T4 continue to be low. However, patients note that their body temperature is back to normal, their energy has increased, and weight management has improved. The lesson is simple—do not rely only on laboratory tests.

Weight loss plans usually fail when the OAT axis imbalance goes unaddressed. However, once the underlying cause of the myriad symptoms is dealt with, weight loss often naturally follows.

Adrenal Fatigue Syndrome vs. Hypothyroidism—Clearing Up Confusion

For many, experiencing both low adrenal and low thyroid function is the norm rather than the exception. This is especially prevalent in women with OAT axis imbalance. They may report a consistently low body temperature. This is one big difference between primary hypothyroidism and hypothyroidism associated with AFS. The table below clarifies the key signs, symptoms, and differences between Adrenal Fatigue Syndrome and hypothyroidism:
<table>
<thead>
<tr>
<th>Characteristics</th>
<th>Adrenal Fatigue Syndrome</th>
<th>Hypothyroidism</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Body Measurements</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Weight</td>
<td>Early; gain weight; severe - cannot gain weight</td>
<td>Generalized weight gain</td>
</tr>
<tr>
<td>Body Temp</td>
<td>Consistently 97.8 or lower</td>
<td>Low 90s to 98.6</td>
</tr>
<tr>
<td>Temp regulation</td>
<td>Fluctuating and exaggerated</td>
<td>Steady</td>
</tr>
<tr>
<td><strong>Mental Function</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mental Function</td>
<td>Brain fog</td>
<td>Slow thinking</td>
</tr>
<tr>
<td>Depression</td>
<td>Sometimes</td>
<td>Frequent</td>
</tr>
<tr>
<td><strong>Physical Looks</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Eyebrows</td>
<td>Full</td>
<td>Sparse outer 1/3</td>
</tr>
<tr>
<td>Hair</td>
<td>Thin, sparse on extremities</td>
<td>Coarse and sparse</td>
</tr>
<tr>
<td>Hair loss</td>
<td>Sometimes</td>
<td>Common</td>
</tr>
<tr>
<td>Nails</td>
<td>Thin, brittle</td>
<td>Normal to thick</td>
</tr>
<tr>
<td>Peri-orbital Tissue</td>
<td>Sunken</td>
<td>Puffy</td>
</tr>
<tr>
<td>Skin</td>
<td>Thin</td>
<td>Normal</td>
</tr>
<tr>
<td><strong>Internal Feeling</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ligaments Flexibility</td>
<td>Good</td>
<td>Poor</td>
</tr>
<tr>
<td>Fluid retention</td>
<td>No</td>
<td>Yes</td>
</tr>
<tr>
<td>Pain</td>
<td>Headache, muscular, migraines</td>
<td>Joints, muscles</td>
</tr>
<tr>
<td>Reactivity</td>
<td>Heightened and hyper-reactive</td>
<td>Hypo-reactive</td>
</tr>
</tbody>
</table>
Despite the presence of both conditions, resolving Adrenal Fatigue Syndrome should take precedence if possible because it is the key to a total healing process.

<table>
<thead>
<tr>
<th>Characteristics</th>
<th>Adrenal Fatigue Syndrome</th>
<th>Hypothyroidism</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Medical Condition</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>History of Infections</td>
<td>Common</td>
<td>Occasional</td>
</tr>
<tr>
<td>Chronic Fatigue</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Orthostatic Hypotension</td>
<td>Frequent</td>
<td>No</td>
</tr>
<tr>
<td>Blood Sugar</td>
<td>Tendency toward hypoglycemia</td>
<td>Normal to hyperglycemia</td>
</tr>
<tr>
<td>Heart Palpitation</td>
<td>Frequent</td>
<td>No</td>
</tr>
<tr>
<td>GI function</td>
<td>Irritable or hyperactive</td>
<td>Constipation and hypoactive</td>
</tr>
<tr>
<td>Malabsorption</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>Sensitive to Medications</td>
<td>Frequent</td>
<td>Normal</td>
</tr>
<tr>
<td><strong>Personality Trait</strong></td>
<td></td>
<td></td>
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<tr>
<td>Personality Traits</td>
<td>Type A</td>
<td>Type A or B</td>
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<tr>
<td>Obsessive Compulsive</td>
<td>Frequent</td>
<td>Mixed</td>
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<tr>
<td><strong>Habits</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sleep Pattern</td>
<td>Waking up 2-4 AM</td>
<td>Sleepy</td>
</tr>
<tr>
<td>Temperature Tolerance</td>
<td>Intolerance to cold and heat</td>
<td>Intolerance to heat</td>
</tr>
<tr>
<td>Food Craving</td>
<td>Craving for sweet and salty</td>
<td>Craving for fat</td>
</tr>
</tbody>
</table>
Axis Component Dominance

Within the OAT axis imbalance, we frequently see that one component dominates, meaning that the ovaries, adrenals, and thyroid do not contribute in equal measure to the problems. The system that clinically dominates usually reflects the organ system that is constitutionally the weakest and thus most damaged. For example, symptoms of subclinical hypothyroidism may be more severe than those associated with adrenal and ovarian dysfunction.

Those who are thyroid dominant usually report lack of energy, dry skin, the inability to lose weight, and so forth. Fatigue is their chief complaint. These women are too tired to worry about PMS or being depressed, although they have symptoms of depression. The adrenal dominant type usually describes fragile emotional states such as anxiety and irritability. Like the thyroid dominant type, these individuals are tired, but the fatigue is minor in comparison to the emotional roller coaster ride they experience due to easily triggered anger or rage. Finally, the ovarian dominant type usually describes significant brain fog and memory loss, along with PMS and other symptoms of estrogen dominance.

Recognizing which component dominates the OAT axis is important in designing a comprehensive recovery program, because the nutritional support, diet, and lifestyle modifications are different for each.

During the recovery process, the type of dominance can change as well. For example, one can be thyroid dominant and progress to adrenal dominant. This can occur when the thyroid function improves or if there is an acute adrenal crash that overwhelms the thyroid. If we know which component is dominant, then clinicians can prioritize the recovery plan and time the correct support measures during the recovery period.

Because so many with Adrenal Fatigue Syndrome or a combination of hormonal imbalances are left to try to find the best remedies on their own, they are usually unaware of the OAT axis and they may not consider the way hormones work together. These individuals often adopt what we call self-guided or scattershot approaches. Some of the literature about AFS might offer a standardized approach, but without careful consideration to the types of dominance and their on-going progression, this often leads to delayed or failed recovery.

Greater Implications

We have discussed the organ systems that produce the major symptoms of OAT axis imbalance so prevalent in early Adrenal Exhaustion, but other organ systems
often become involved, particularly as the imbalance advances. For example, consider digestive functions, specifically, processing and assimilating nutrients. If the OAT axis imbalance is left unattended, individuals may experience reduced absorption of nutrients from the GI track and other digestive conditions such as: leaky gut; irritable bowel syndrome (a syndrome that includes many unpleasant digestive symptoms, such as alternating diarrhea and constipation); food sensitivities that were not present before; internal dysbiosis (an imbalance of intestinal flora, which over time is linked to a variety of conditions); and reduced liver function, despite normal lab test results.

When the OAT axis is not well balanced, no organ system is spared from dysfunction.

**Treatment Confusion**

As we’ve discussed, women with OAT axis imbalance often end up seeing various specialists who may not be mindful of the organ system triad at work. The focus tends to be on either the thyroid, ovarian, or both. As long as the adrenal component is ignored, the body’s ability to recover is marginalized. Not only that, unintended consequences emerge. For example, if a woman begins taking thyroid medication, she may see menstrual irregularities begin. This may be followed by problems dealing with stress and worsening fatigue.

Over time, patients are invariably disappointed and discouraged and usually move on to another specialist. Sometimes, patients give up. If they have taken antidepressants, thyroid replacements, ovarian hormones such as synthetic estrogen and progesterin (or even the natural form of these hormones), or other medications, they may be worse off. Unfortunately, if patients resort to self-navigated programs, they usually end up futilely jumping from one nutritional or glandular supplement after another, or in a scattershot manner seek this or that exercise or meditation program that promises health improvements. This approach usually leads to frequent adrenal crashes and worsening conditions.

Recovery can be complex, and it is critical to address the needs of the individual based on how advanced the OAT or AT axis imbalance is. The state of estrogen dominance is an issue unto itself, and we urge you to educate yourself about this common situation. (Our mini-book Estrogen Dominance focuses on this topic and is available at [www.DrLam.com](http://www.DrLam.com).)

The OAT axis and the combination of symptoms and progression to Stage 3C can seem a bit abstract, but every day we see the steady path of AFS to this stage in the lives of women. In men we see the same progression to AFS through the AT axis
imbalance. Fatigue, lethargy, low libido, anxiety, brain fog, and weight gain are the key symptoms for men.

Clearly, reversing Stage 3B is critical if one is to avoid the natural progression of AFS into Stage 3C, which we turn to next.

**Key Points to Remember**

- The body’s hormonal organs are closely tied together through various axes. Though lesser known than the HPA axis, the ovarian-adrenal-thyroid (OAT) hormonal axis is extremely important.

- When the OAT axis is disrupted, there is an imbalance of hormones that leads to symptoms of estrogen dominance, low energy, and hypothyroidism.

- Each portion of the OAT axis affects the others. Imbalance of one will worsen the other and vice versa.

- Estrogen dominance worsens adrenal function, which in turn aggravates estrogen dominance.

- Adrenal Fatigue Syndrome lowers thyroid function, which in turn worsens AFS.

- The OAT axis imbalance is often missed. Symptoms of AFS and hypothyroidism are similar. Sufferers are treated for hypothyroidism when the underlying problem is adrenal function.

- It is common to stimulate thyroid function in an attempt to reduce fatigue. This strategy often fails and over time AFS tends to worsen.

- Within the OAT axis, each of the components is not equally damaged. One of the components is usually more damaged than the others, presents itself as the dominant symptom, and thus masks the other components of the axis. Knowing which component is dominant is important in the overall assessment and recovery plan.
As we saw in Stage 3B of Adrenal Exhaustion, sufferers experience many symptoms resulting from the disruption of major adrenal related hormonal axes. However, despite the range of symptoms, including subclinical hypothyroidism, low energy, estrogen dominance, irregular periods, and low libido in men and women, critical body functions remain relatively intact. In other words, the body as a whole still functions relatively well. Most sufferers continue to work fulltime. However, as the adrenals decompensate and enter into Phase C of Adrenal Exhaustion, the body continues to weaken, which triggers its various reserve systems to spring into action as the body loses its homeostasis and equilibrium.

Although by this time, many individuals have already sought medical help for a confusing array of symptoms that manifest in Adrenal Fatigue Syndrome, reaching this stage might drive them to look for a different approach.

Homeostasis

*Homeostasis*, derived from Greek, means to *stand equally*. It developed from a theory of physiology first put forth by Claude Bernard. Briefly, the theory holds that in order for a closed system to maintain equilibrium with its surrounding environment, the system requires many minute changes and dynamic internal adjustments to maintain the status quo. The human body is comprised of more than 70 trillion cells, and to be in optimum health each cell must maintain its equilibrium or homeostasis with its surrounding environment. For homeostasis to occur, the cells need to excrete waste and take in new materials in equal measure. Regulatory systems, such as the negative feedback loop and the autonomic nervous system, are needed to maintain cellular equilibrium. Therefore, we define homeostasis as the stability of the physiological systems that maintain life.

Without this equilibrium, the body is unable to perform such mundane function as standing up, maintaining stable body temperature and heart rate, and so forth. Depending on the stress placed on the regulatory systems, the needs of cells change. Outside our conscious awareness, the regulatory systems are activated automatically in order to maintain internal harmony in the body.
These systems are jeopardized in 3C of Adrenal Exhaustion. The key regulatory systems for internal equilibrium are the nervous system and the endocrine system. While the functions of both of these systems may be compromised in earlier phases, they enter into a steep slope of declining function during this phase as seen in Figure 9 below:

Figure 9. Adrenal Functional Decline vs. Adrenal Fatigue Stage

Put simply, the internal thermostat of the body is broken in this phase. In order to maintain normal function, the body activates compensatory systems, but unfortunately, these reserves and compensatory systems are crude at best and they lack the finely tuned capabilities of the regular systems. The key functions of the body are saved, but a variety of side effects surface. Side effects in themselves are the body’s way of alerting us that it is in trouble.

In practical terms, in addition to the same symptoms seen in Stages 3A and 3B, those in 3C Adrenal Exhaustion often report the gradual or sudden onset of any of the following as this phase progresses:

- panic attacks
- onset of heart palpitations despite normal cardiac function
- onset of dizziness and lightheadedness at rest
• waking up in the middle of the night for no reason and inability to go back to sleep
• onset of fragile emotional states such as crying for no apparent reason
• fragile reactive fluid state with edema and sodium imbalance
• POTS-like symptoms (postural orthostatic tachycardia syndrome, which is rapid heart rate while arising from a supine position)

Dysfunction of the autonomic nervous system (ANS) is responsible for many of Stage 3C symptoms. In order to grasp how this occurs, it’s important to take a quick and partial tour of the nervous system to see its myriad functions.

Ben (age 39) talks about his experience with Adrenal Fatigue Syndrome:

I struggled with fatigue on and off for more than ten years. I ignored it for a long time and pushed myself to overcome it. But, over a three to four year period, I reached a point where fatigue was interfering with my daily life. As a senior executive for a major corporation, I’m on the road 60-75 nights a year, and that travel drained my energy. In order to keep functioning, I needed to go to bed early, usually before 9:00 or 9:30 on a typical weeknight. Unfortunately, even after several hours sleep, I felt groggy and tired in the morning.

As my fatigue worsened, I had to give up playing golf on the weekend with my friends. I needed all my energy to keep up with my job. As time went on, I had difficulty working out, and gradually it seemed I could no longer build muscle. I experienced severe brain fog, and my blood pressure dropped and became too low. It was so frustrating to see new symptoms appear along the way, from insomnia to shakiness, if I didn’t eat every two or three hours.

Of course, I saw my doctor who ordered a variety of tests, but they all came back normal, so he sent me to an endocrinologist, who ordered more tests. Then I went to an allergist and found I had some food allergies that could be causing fatigue. The change in diet didn’t help, though, and neither did the herbs and vitamins my wife found for me. At one point, my family physician told me that my fatigue was in my head and antidepressants might help. Skeptical as I was, I gave the antidepressant a try but it had no effect on my exhaustion or anything else. I still felt weak and short of breath during exercise, and I didn’t sleep any better, either. When the doctor said, “I guess you’ll have to learn to live with this exhaustion,” I knew I needed a new direction.
**A Nervous System Primer**

Without question, the nervous system is one of the most complex of the body’s organ systems, but even a superficial understanding helps understand the manifestation of some symptoms associated with advancing Adrenal Exhaustion. Here are the basics:

The body is divided into the central nervous system (CNS, comprising the brain and spinal cord), and the peripheral nervous system.

The peripheral nervous system is in turn divided into two parts: the *somatic nervous system* that regulates skeletal muscle functions that help us deal with the outside world, and the *autonomic nervous system* (ANS) that regulates functions of the smooth muscles and glands.

The ANS is further divided into five branches:

- the parasympathetic nervous system (PNS)
- the sympathetic nervous system (SNS)
- the enteric nervous system (ENS), which regulates intestinal (enteric) functions
- the sympathetic cholinergic system (SCS) that regulates sweating
- the adrenomedullary hormonal system (AHS), also called the sympathetic adrenergic system

The nervous systems are illustrated in the following diagram:

![Figure 10. Nervous Systems](www.DrLam.com)
The PNS regulates the so-called vegetative processes such as urination and digestive functions. Dysfunction of the PNS leads to a wide variety of illnesses including abnormal gastric acid secretion, erectile dysfunction, and loss of urinary control and bowel movement irregularities.

The SNS regulates the unconscious housekeeping functions of the body at rest and during normal daily living, including blood pressure, body temperature, force of the heartbeat, and heart rate around the clock. It is absolutely necessary for handling simple stressors such as exercise, standing up, and adaptation to change in environmental temperature. Therefore, the SNS is working in the background around the clock without our knowledge. It is not only activated when we face severe stress, but in times of emergency.

The AHS regulates the emergency and distress functions such as those responsible for the body’s fight-or-flight response and it has properties similar to the sympathetic nervous system (SNS), plus more. It is truly the body’s responder of last resort when faced with extreme stress. Different from the SNS structurally, the nerve fibers of this system innervate the adrenal medulla directly from the spinal cord via the splanchnic nerve (paired nerves carrying fibers of the ANS) and is preganglionic (a ganglion is a biological tissue mass, most commonly a mass of nerve cell bodies). This direct highway of nerve transmission occurs at superfast speed, providing instant response by way of epinephrine (also called adrenaline) release from the adrenal medulla when the body is under stress. The AHS is activated in fainting, shock, extreme fear, hypoglycemia, and low body temperature.

The combination of SNS and the AHS constitutes the sympathoadrenal system (SAS). Maintaining a normal balance of the SAS within the autonomic nervous system is vital to optimal body function and homeostasis. This is of particular importance in the case of Adrenal Exhaustion. Dysregulation of the SAS is the hallmark of Stage 3C Adrenal Exhaustion symptoms.

**Norepinephrine vs. Epinephrine**

We provided information about norepinephrine in Chapter 2, *Stress, Hormone Basics, and the “Forgotten” Adrenals*, explaining that it has duo roles. It is the principle stress signaling neurotransmitter in the brain. Outside the brain, norepinephrine acts as the hormonal messenger of the sympathetic nervous system (SNS) and is responsible for making sure that our daily activities proceed smoothly.

We need to keep in mind the following:

- Norepinephrine is the chemical mother of epinephrine and they share many similar functions.
• Epinephrine is the chemical messenger of the AHS released from the adrenal medulla.

• Epinephrine is much more potent when compared to norepinephrine. Therefore, epinephrine is the ultimate emergency fight or flight hormone, with norepinephrine a helper.

• Epinephrine primarily deals with emergency functions of the body. It is also involved in the mundane functions of daily living, such as standing up and normal exercise, though in much smaller amounts.

• The exact pathophysiological mechanisms of how these two catecholamines play in many of the resulting symptoms are still not known. Many other factors are likely involved.

Clinically, however, it appears the more advanced the adrenal weakness, the more dominant role epinephrine plays. This is likely due to an increased amount of epinephrine being released the more stress is experienced.

The Sympathoadrenal System (SAS)

Proper understanding of the SAS is a cornerstone in accurately deciphering the convoluted symptoms often present in Stage 3C. The SNS and the AHS (defined above) are two components of the SAS. Remember that norepinephrine in the brain acts as a neurotransmitter that stimulates arousal. Low levels of brain norepinephrine are associated with loss of mental alertness, poor memory, and depression. This is why medications for depression often target both dopamine and norepinephrine in an attempt to restore them to normal levels.

Mild elevations of the norepinephrine level produce heightened arousal, similar to what we experience with stimulants. This arousal is considered pleasurable and several so-called recreational/street drugs, such as cocaine and amphetamines, work by increasing the level of norepinephrine in the brain.

Moderately high levels of norepinephrine take arousal from pleasant to a level that makes us uncomfortable, such as anxiety, increased startle reflex, jumpiness, fear of crowds and tight places, impaired concentration, restless sleep, and physical changes. The physical symptoms may include rapid fatigue, muscle tension/cramps, irritability, and a sense of being on edge. Almost all anxiety disorders involve elevation in norepinephrine levels. Severe and sudden increases in norepinephrine levels are also associated with panic attacks.
Chemically, epinephrine is the son of norepinephrine, and in turn, norepinephrine is the chemical son of dopamine. These three chemicals, epinephrine, norepinephrine, and dopamine, fall within a family called catecholamines and they represent three different ways the body is regulated internally.

Transported by the bloodstream once it is released from the adrenal glands, epinephrine has wide ranging effects throughout the body. Norepinephrine is also released from the adrenal medulla in smaller amounts relative to epinephrine. Released from the nerves of the SNS, norepinephrine primarily acts locally on nearby target cells such as the heart. For example, when released into the heart by the SNS, norepinephrine regulates the heart rate and it must be highly concentrated in the bloodstream before it can exert its effects as a hormone.

Epinephrine is one of the most powerful vasopressor (causing a rise in blood pressure) drugs known. It increases the heart rate and the strength of heart muscle contractions. It constricts blood vessels and veins, and is also a powerful bronchodilator (relaxes the airways) and inhibits the release of histamines. Histamines are triggered by an allergic reaction. It triggers the inflammatory response. Finally, as previously mentioned, epinephrine (adrenaline) is primarily responsible for the body's emergency fight-or-flight response, not norepinephrine.

At rest, concentrations of epinephrine and norepinephrine in the blood are low, but they can rise under certain physiological (adaptation) or pathological conditions. For example, when one goes from the supine to the standing position, norepinephrine concentration increases two fold. In patients with pheochromocytoma plasma (a tumor in the adrenal gland where large amounts of catecholamines are released), symptoms consistent with excessive norepinephrine and epinephrine can surface, including: headaches, sweating, palpitations, elevated blood pressure, and anxiety.

The actions of epinephrine and norepinephrine are generally similar, but norepinephrine constricts most blood vessels, while epinephrine (adrenaline) causes constriction in many networks of minute blood vessels but dilates (opens or widens) the blood vessels in the skeletal muscles and liver. Both hormones increase the rate and force of contraction of the heart, thus increasing the output of blood from the heart and increasing the blood pressure under normal conditions.

Epinephrine and norepinephrine also have important metabolic actions. Epinephrine stimulates the breakdown of glycogen into glucose in the liver, which then causes blood sugar levels to rise. Both hormones increase the level of circulating
free fatty acids. The body can then use the extra amounts of glucose and fatty acids as fuel in times of stress or danger, when increased alertness or exertion is required.

Because epinephrine is much more powerful than norepinephrine, its deployment is more tightly controlled and it is released in great amounts during times of extreme distress. It is sometimes called the emergency hormone because it is released during stress, and its stimulatory effects will fortify and prepare an animal for either fight or flight.

When the SAS is activated as a response to stress, both norepinephrine and epinephrine are released into the body.

Norepinephrine and Epinephrine (Adrenaline) Overload

Chronic or acute stress leading to Adrenal Exhaustion increases SNS as well as AHS activity as a compensatory response, which raises the absolute level of both norepinephrine and epinephrine in the body. Usually, the SNS is already in operation 24/7, helping us deal with the routine stressors of daily living. The AHS involvement is relatively minor when the body is calm. Because norepinephrine is a much weaker hormone compared to epinephrine, its systemic effects are not as prominent unless the overproduction is severe.

As Stage 3C progresses, we see clinical signs of norepinephrine overload first as the SNS is put on overdrive. The result is occasional mild heart palpitation, but it is not worrisome. Anxiety levels may increase, but not out of control. Epinephrine overload comes later as the body further weakens which puts the AHS on overdrive. Symptoms are similar to norepinephrine, only worse and more intense. Heart palpitations may be more severe requiring visits to the emergency room at times. Atrial fibrillation may be triggered. Full blown panic attacks may surface.

The following symptoms are associated with both norepinephrine and epinephrine overload. The key difference lies in intensity. The more epinephrine circulating in the body, relative to norepinephrine, the higher the intensity of symptoms. They include:

- increase in heart rate
- increase in blood sugar
- increase in respiration
- sense of impending doom
- relaxation of skeletal muscle blood vessels
- increase in energy that does not feel natural
Stage 3C—Disequilibrium

- increase in emotional sweating
- constriction of skin blood vessels (pallor)
- trembling

Both epinephrine and norepinephrine overload worsen existing ANS imbalance, usually already present in a lesser degree in earlier phases of Adrenal Exhaustion. Because our hormones are interconnected, severe dysregulation of the SAS as seen in late Stage 3C (or borderline Stage 3D) can trigger other systems’ dysfunction, including:

- severe orthostatic hypotension
- extreme fragile blood pressure
- inability to stand for more than a few minutes
- sudden onset of lightheadedness, "spaciness," and dizziness
- atrial fibrillation and premature ventricular contractions (PVCs)
- extreme temperature intolerance
- fragile body fluid and electrolyte state
- sudden onset of fainting
- sudden loss of bowel and urinary control

The Problem with the SAS

When healthy people are stressed, excess epinephrine released from the adrenal glands is quickly swept up by efficient epinephrine transporters that carry it away before it can wreak havoc inside the body. For example, standing requires blood vessels to contract to keep gravity from allowing all your blood to pool in your legs. The burden of this primarily falls on norepinephrine. Epinephrine is also released, though in a much smaller amount. The body releases just the right amount of this hormone throughout the day as we move around and change positions. Any excessive amounts of epinephrine are cleared out of the body quickly. The body's blood pressure is thus maintained in a normal state. Proper balance of epinephrine and norepinephrine within the SAS system is of paramount importance for us to feel good. Anyone who is healthy will not notice the continuous rebalancing process happening throughout the day.

On the other hand, in Stage 3C of Adrenal Exhaustion, over activation of the SAS can lead to the release of larger than normal amounts of both epinephrine and norepinephrine, especially if the AHS component is put on overdrive. This is more
evident in late Stage 3C, where epinephrine seems to be the most prominent hormone flooding the body. Adrenaline rushes are common. Consistently high levels of epinephrine (and to a lesser degree, norepinephrine) may also lower the threshold of normal cardiac rhythm, triggering abnormal cardiac arrhythmias, such as atrial fibrillation and premature ventricular contraction (PVC).

As if this is not enough, those with a weak constitution may already have a reduced capacity to clear unwanted epinephrine and its metabolites from the body. This further contributes to excessive amounts circulating in the body. Increased production along with reduced clearance leads to toxic buildup of metabolites, which manifests symptoms such as panic attacks, a sense of impending doom, rage, brain fog, severe insomnia, and fatigue. Those on steroidal hormone replacement already are particularly vulnerable as their liver is invariably overtaxed much of the time serving as the major breakdown center of such medications.

While the SAS ensures the body’s survival by bringing more blood supply to the brain, the fine control of the rest of the body is compromised, including the metabolic, endocrine, and central nervous systems. As a result, the body often experiences exaggerated and wild metabolic and hormonal rollercoaster rides, with accompanying fluctuations in blood sugar level, body temperature, blood pressure, heart rate, sleep, and emotional states. During an adrenal crash in this stage, AFS symptoms can become drastically exaggerated. Once the SAS is activated, it may take hours or even weeks before the body is able to return to baseline.

Those with weak adrenals constitutionally have higher tendencies to be more sensitive to excessive epinephrine/norepinephrine, and are more prone to suffer symptoms resembling a clinical condition known as dysautonomia, meaning a clinical dysfunction of the ANS. The weaker the adrenals, the stronger this association will be.

**Reactive Sympathoadrenal Response (RSR) vs. Sympathetic Overtone (SO)**

In the context of Adrenal Fatigue Syndrome, over-stimulation of the SAS with its resulting epinephrine and norepinephrine overload is usually a compensatory reaction of the ANS, triggered by excessive stress well beyond what the body can handle. This in turn causes the SAS to be activated and put into overdrive. The SNS and the AHS are activated, hence the name sympathoadrenal. The resulting cascade of compensatory responses is called reactive sympathoadrenal response (RSR), that
is, reactive to another action. To put it simply, the body is bathed in a sea of both epinephrine and norepinephrine.

In contrast, norepinephrine overload as a function of an overtaxed SNS is called sympathetic overtone (SO). SO is generally less severe compared to RSR because norepinephrine is a less potent hormone compared to epinephrine. It tends to be more prominent in early Stage 3C while RSR more so in late Stage 3C and beyond. This has important clinical ramifications when it comes to assessing the level of adrenal weakness and planning for recovery.

HPA, SNS, and SAS

Those who are in Stage 3C Adrenal Exhaustion often concurrently experience the worsening symptoms experienced in Stages 3A and 3B, the point at which we see early system dysfunction and hormonal axis imbalance. However, keep in mind that we see tremendous overlapping of symptoms among the three phases because they are closely related. For example, in Stage 3C disruptions of the SAS affect the HPA axis that controls adrenal cortex function. We also see concurrent imbalances of the OAT or AT axis.

Because the SNS is part of the SAS, the SNS is therefore related to the HPA axis. Stimulating one system tends to inhibit the activity in the other. As the SNS outflow is increased, glucocorticoid released from the adrenal cortex is reduced. In other words, the reactive sympathoadrenal response (RSR) seen in Stage 3C, with increased secretion of epinephrine and norepinephrine, will blunt cortisol and aldosterone output. As a result, salt craving increases and low blood pressure becomes more pronounced, exacerbating Stage 3A and 3B symptoms. The body is in a no-win situation.

Sensitivity to Stressors

In Stage 3C of Adrenal Exhaustion, the body can become extraordinarily sensitive to stressors. Mundane activities may act as triggers in this phase, although these ordinary stressors do not normally behave as triggers in early stages of AFS. The threshold for stressors to act as triggers is lowered for reasons we don’t fully understand. For example, these mundane but potential triggers include such things as:

- eating a big meal high in refined carbohydrates
- watching an action movie
- being exposed to fluorescent lighting
- taking a cold drink
• prolonged sitting in front of a computer monitor
• taking a long car drive
• being startled by the phone ringing in a quiet room
• performing a short but intense dance or exercise
• being exposed to cold or hot temperatures that the body is not used to (even though most people consider the temperature normal)
• taking an uphill or long walk
• being exposed to indirect sunlight
• drinking soda pop, tea, or coffee
• eating chocolate
• eating food that is hard to digest such as corn

Symptoms of Adrenal Fatigue Syndrome usually become drastically exaggerated during an adrenal crash in Stage 3C. Once the SAS is activated, it may take hours or even weeks before the body is able to return to baseline. This state of acute adrenal weakness, an adrenal crash, may send sufferers to the emergency room, but complete medical workups are invariably negative and don’t reveal the true cause of the problem. In addition, the weaker the adrenal function, the longer it takes to recover.

Just as happens in Stages 3A and 3B, most sufferers sadly continue taking prescribed drugs for symptoms management. By this time, antidepressants or antianxiety medications may have been added in order to control symptoms that have a mental/emotional component. In the interim, conventional laboratory tests continue to be normal.

**Wired and Tired**

Those in Stage 3C are often concurrently burdened by worsening symptoms of Stages 3A and 3B, such as hypoglycemia, brain fog, anxiety, and so forth, plus the symptoms of hormonal axis imbalance. Because sleep is invariably disrupted, many live in a state of persistent tiredness or chronic fatigue. This is expected because the body is essentially in a slow down mode in order to conserve energy. As far as the body is concerned, the less activity the better.

At the same time, the body at this stage is usually on high alert, a state of hyper-arousal, mediated by the SAS peripherally and brain norepinephrine centrally. This is the body’s ultimate way of dealing with stress: stay alert while laying low. As mentioned before, we call this wired-and-tired. As a result of being on full alert, those in
this phase are typically unable to relax. Severe insomnia is the norm. Some individuals
don’t sleep much at night but only catch catnaps during the day. Others fall asleep
only after a long wakeful period, as the tired factor finally outweighs the wired factor.
However, the wired factor tends to return and periods of sleep are short. In other
words, sleep patterns are severely disrupted.

As more epinephrine is released without the dampening effect of cortisol, blood
pressure can suddenly rise and spike on a reactive basis, leading to an abrupt onset of
intermittent higher than normal blood pressure, anxiety, and heart palpitations. When
the rush is over, the body drops back down to a lower than normal level of function,
resulting in lower than normal blood pressure and one becomes exhausted. Blood
sugar levels can similarly be affected, with resulting subclinical hyperglycemia first
leading to a hypoglycemic state characteristic of an unstable blood glucose curve,
while blood sugar remains within normal limits by conventional medical standards.
It comes as no surprise that the body is constantly drained of energy just having to
deal with this never ending parade of disequilibrium. This downward cascade of
decompenasation is a true nightmare in the making.

**Unexpected and Paradoxical Reactions**

Starting in Stage 3C, we commonly see unexpected and paradoxical reactions to
strategies that worked in early stages. These reactions can be exaggerated, unexpected,
or opposite. For example, as Adrenal Exhaustion progresses through 3C and into 3D,
one may not be able to tolerate vitamins, herbs, or medications that were once helpful;
these substances may now produce an unexpected and unpleasant reaction. Not only
do these measures fail to improve fatigue, they may make it worse. Some of these
reactions include:

- When taking steroids, experiencing fatigue or malaise instead of a sense
  of calm.
- A sudden onset of anxiety attacks and impending doom at rest.
- Sudden onset of heart palpitations, despite normal cardiac function.
- Sudden onset of dizziness and lightheadedness at rest, after stressful
  situations, or after consuming certain types of food, especially carbohydrates.
- Sudden onset of fluctuating blood pressure.
- Staying in bed for an extended period of time with no energy to get up,
even after a full night’s rest.
• After vigorous exercise, experiencing a sense of being beaten up that lasts for days.
• Inability to think clearly and difficulty recalling even a recent problem.
• Waking up in the middle of the night for no reason and then being unable to go back to sleep.
• Being constipated instead of having loose stools when taking high doses of ascorbic acid or magnesium.
• A sense of being wired up and anxious after taking vitamins, adrenal glandular, or herbs.
• Becoming more toxic instead of feeling better when going through a detoxification program like juice fasting or cleanses.
• Sudden onset of fragile emotional states such as crying for no apparent reason.
• A sense of well-being after taking selected nutrients, only to be followed by a crash.
• Fluid retention/depletion in a setting that is highly sensitive to sodium load, which in turn is hard to maintain.
• Intolerance to certain treatments, such as acupressure, acupuncture, cranial-sacral therapy, chiropractic manipulation, and others; or, after a brief honeymoon following treatments, a crash occurs.

One can experience any combination of the above, and we don’t fully know the exact cause of each of these symptoms, though it is clear that an overall dysfunctional ANS and compromised liver clearance system is responsible for many of the symptoms. We’ve observed that the more advanced the Adrenal Exhaustion, the more prevalent the paradoxical and unusual symptoms become as the neuroendocrine system becomes dysregulated. Collectively, they point to a body that has lost the ability to maintain the fine control necessary for a stable internal homeostasis environment.

**Cognitive Toll**

Physiologically, our body is in a state of cognitive hyperarousal—flooded in a sea of ever increasing brain norepinephrine while cortisol output from the adrenal gland is waning. These are automatic responses to the experience of threat.
The consequences of chronic relentless demand on the brain can also become toxic. For example, our prefrontal cortex begins to slow down. We become impulsively reactive rather than logically reflective. Our decision making process becomes blunted as our capacity to think clearly is compromised. This cognitive toll is especially serious for anyone whose work requires extensive mental function, such as executives, teachers, scientists, engineers, lawyers/judges, managers/supervisors, healthcare professionals of all kinds, and so forth. It should come as no surprise that at this stage, sufferers are invariably confused, anxious, and very frustrated.

Clearly, Stage 3C can be very debilitating. Fortunately, corrective actions are possible and the outcome generally positive. If not properly reversed, progression to Stage 3D could be likely.

**Key Points to Remember**

- Stage 3C is also called disequilibrium. The body’s emergency systems are being activated and called to action in order to stabilize internal functions.
- Much of this alarm response is driven by the sympathetic nervous system (SNS) with its chemical messenger norepinephrine, and the adrenomedullary hormonal system (AHS) with its chemical messenger epinephrine.
- The SNS and AHS are collectively called the sympathoadrenal system (SAS).
- The hallmark of this phase is the dysregulation of the chemical messengers epinephrine and norepinephrine of the SAS.
- Symptoms common in Stage 3C include anxiety attacks, heart palpitations, electrolyte imbalances, dizziness, severe insomnia, and paradoxical reactions to medications and supplements.
- Crashes with longer than usual recovery phases are more frequent, as the body becomes more sensitive to triggers and the crash threshold is lowered.
- Routine laboratory tests continue to be negative.
The body’s strategy in dealing with unrelenting stress involves reduction in energy expenditure by down-regulating nonessential functions such as metabolism, while concurrently redirecting limited internal energy resources to vital organs, such as the brain and heart. This process is well underway in previous phases of Adrenal Exhaustion, mediated largely by adrenal hormones as well as the autonomic nervous system. By the time Stage 3D is reached, the body is nearly exhausted in its effort. In this phase, the body, in its all out heroic effort to maximize chances of survival, continues to down regulate. Unfortunately, this down regulation further reduces vital hormonal output, exaggerating a downward vicious cascade. Cortisol output is low throughout the day, with both epinephrine and norepinephrine flooding the body. No system is spared from this negative impact. No wonder the clinical symptoms are convoluted and confusing to say the least.

While survival is not in question yet, the body is severely decompensated and hormonally struggling just to make ends meet. Indeed, the adrenal system of hormonal control is near failure. What makes this clinical state perplexing is that for the most part, routine laboratory tests continue to be within or slightly outside the normal range, yet one can see the body literally falling apart internally. Sufferers will describe themselves as the living dead.

Without adequate levels of hormones to regulate various bodily organs, along with the autonomic nervous system dysregulation, the body is in disarray. We see rapid weight loss, reduced gastric assimilation, and severe loss of muscle tone as the body enters into a shutdown mode to further conserve energy. No organ is spared. Put simply, the body is on the brink of surrendering, no longer having the energy to try to work its way out of this severe weakness.

In Stage 3D therefore, the adrenals have lost most of their ability to serve as the body’s stress control center and they become hypersensitive, and for reasons we don’t fully understand, they react negatively to any attempts to jump start them. Much of
what we know in this phase comes from clinical observation. Fortunately, only a very small percentage of those with AFS progress to this phase.

Traditional medications and nutritional supplementation that are successful in earlier stages usually backfire in Stage 3D. The body is inherently unstable. In terms of physical activity, one is often incapacitated and bedridden due to fatigue. Many people need help with daily activities such as driving, shopping, and cooking, and some may only be able to stay up and walk around for a few minutes before they become so tired they need bed rest.

We know this is the body’s last resort way to conserve energy. As this takes place in one organ system, the rest of the body down regulates, too. Digestion and the removal of metabolites decreases, with a drop in the basal metabolic rate. The reproduction system is essentially shut down, evidenced by non-existent libido in men, and amenorrhea in women. No system can escape from this body wide energy conserving effort. This is a slow motion controlled collapse engineered by the body as the only way it knows to ensure survival. Understanding this helps us better interpret the many signs and symptoms of this phase.

**Signs and Symptoms of Stage 3D**

Consistent with an unstable body, adrenal crashes occur frequently, with much delayed recovery. In addition to previously mentioned characteristics of Stage 3C, more unpleasant symptoms may surface as follows:

- **Gastric bloating with jaw tightness after eating, and only small amounts of food or liquid can be tolerated at one time.**
  
  For reasons not fully understood, the body seems to enter a state of clamp down, where the digestive apparatus appears to reject any attempt to ingest food. The body may resist even nourishing liquid such as chicken or beef broth. In severe cases, the individual may tolerate only a few teaspoons at a time. Rest is often needed before the next attempt.

- **Extreme sensitivity to minute doses of iodine, herbs, glandulars, and vitamins—an extreme paradoxical reaction.**
  
  The more advanced the phase, the more this sensitivity increases. An amount as little as 10 mg of vitamin C may be too much. We can’t describe the exact physiological mechanism, but poor clearance is likely an important factor. The culprit may not be the natural compound itself but the inability of the body to clear the byproducts promptly, leading to an internal build up and resulting toxic state. Forcing the body to take in more nutrients often worsens the condition over time.
• **Extreme intolerance to many vegetables, especially those high in potassium.** Potassium supports your body by maintaining the balance of water and acid.

Most in Adrenal Fatigue Syndrome are high in potassium relative to sodium, although when measured, both are within normal laboratory range. Moreover, potassium is important because it metabolizes carbohydrates and protein and helps build muscle. High potassium vegetables such as tomatoes and sweet potatoes are often problematic at this phase. Tomatoes are one of the highest potassium vegetables, with 400 mg per tomato and tomato juice can contain as much as 535 mg of potassium. A baked sweet potato with skin is also a high potassium vegetable, with 508 mg of potassium. Other high potassium vegetables with 200-300 mg of potassium include one cup of asparagus, or one half cup of cooked pumpkin. Commercially available vegetable juices as well as many popular sports drinks are also high in potassium. These are best avoided if the body cannot tolerate them. Symptoms can include nervousness, agitation, heart palpitations, gastric bloating, and gastric pain. Those who over indulge in food high in potassium are at risk of adrenal crashes.

• **Extreme nervousness and a sense of impending doom.**

The exact cause is not known, but chemical and neurotransmitter imbalances are likely involved in the central nervous system. In particular, brain norepinephrine overload is the likely culprit. Peripherally, epinephrine overload from an overactive AHS may be implicated. This can lead to a wide variety of sympathetically driven responses including sweating, anxiety, and the irregular blood pressure we commonly associate with nervousness.

• **Uncomfortable chest and head contractions when arising from a supine position.**

When occurring in the chest, these contractions are usually sharp and very different from angina pain, which is generally dull in nature. Cardiac workups are usually completely negative, with no abnormal findings. It is unclear if these contractions are due to an exaggerated musculoskeletal reflex response; a loss of blood volume on postural changes, which trigger hormonal releases that lead to muscle contraction; or overstimulation of muscles that are already in a catabolic state.

• **Extreme sensitivity to gluten, wheat, and dairy products.**

These sensitivities are quite common in Stage 3C, but tend to get worse in this phase. Just touching wheat products may initiate a reaction for those who are extremely sensitive. In other words, sensitivity increases and symptoms are more
intense. Those who are constitutionally weak may have concurrent pH imbalances, which lead to imbalances of intestinal flora (dysbiosis). Common symptoms include bloating, itchiness, gastric pain, diarrhea, irritability, joint pain of unknown origin, runny nose, heart palpitations, recurrent Candida infection, and insomnia.

- **Extreme sensitivity to massage, acupuncture, sauna, detoxification, or stretching.**

  Any excessive movements of the musculoskeletal system may trigger further protein breakdown, already in a catabolic state. Muscles are now fragile. Without proper collagen support, they tend to break down easily. Deep tissue massages could exacerbate this and should be avoided. Even gentle lymphatic massages may worsen the condition in this phase. This is likely due to the concurrent inability of the liver to clear toxic metabolites from the body on a timely basis from lymphatic drainage overload during the massage. Most detoxification methods, even when executed gently, carry great risk of worsening the condition.

- **Extreme fluid and electrolyte imbalances, such as dilutional hyponatremia and fragile blood pressure.**

  The body appears to be in a state of disarray and confusion in fluid and electrolyte balance. One can go in and out of such imbalances rather frequently. Too much water relative to sodium balance can lead to dilutional hyponatremia (insufficient salt in body fluids). The reverse is also true. Too little fluid intake can lead to dehydration. Too much salt intake can lead to edema (too much fluid collected in body tissues). These can be triggered with the smallest amount of fluid imbalance which we usually see only in those with severe infection, trauma, shock, or kidney disease. Laboratory electrolyte studies are usually normal at first until the condition is well advanced.

- **Extreme reliance on prescription medications for sleep.**

  Natural compounds with sleep supporting properties, such as tryptophan, GABA, and melatonin, seldom work at this stage. Strong prescription medications are usually required, and even then, periods of sleep don’t last long. Rather, waking frequently becomes the norm. That means the body never is fully rested during the night. Even the strongest sleep medication may only produce a few good hours of sleep at a time. It’s also common to wake up groggy.

- **Extreme temperature intolerance to heat, such as sunlight or a hot bath, and cold, such as an open refrigerator, a cool room, and cold water.**

  The body’s internal thermostat seems to malfunction. The body is unable to tolerate the normal range of external temperatures and easily tires. It may be
problematic to simply leave the house and go outside, where the temperature difference is only a few degrees. The body’s sweat response also appears to be dulled and is easily dehydrated, especially when outdoors. A five minute exposure to sunlight may trigger an adrenal crash. Frequent fluid replenishment is necessary.

- **Extreme high frequency of racing thoughts where the mind is unable to stop and the person feels continuously wired.**

  This symptom likely occurs because the body is flooded in a sea of brain nor-epinephrine, but is unable to clear it in a timely basis. The more advanced the phase, the more prominent this dysfunctional clearance becomes. Unwelcome toxic metabolites build up in the brain. When it is time to sleep, the body cannot relax to allow normal sleep function to take place. Invariably, this is associated to a high degree with sleep onset insomnia, and to a lesser degree, with sleep maintenance insomnia.

- **Extreme sensitivity to televisions, computer monitors, telephones, cell phones, fluorescent lights, microwaves, cordless telephone, electric blankets, and Wi-Fi signals.**

  Constant emission of electric signals and radio frequencies from wireless technology can disturb heart rate variability. This can lead to autonomic nervous system disruption, with increased sympathetic tone and reduced parasympathetic tone. Heat and vibration from such emission at the cellular level is not well tolerated. Symptoms including fatigue, headache, tingling sensation in the face, chest pain, vision difficulties, nausea, vertigo, insomnia, tremor, tachycardia, irritability and heart palpitations, can be triggered. Microwave radiation is particular harmful. Those with such sensitivity should stay at least twenty feet from any electrical appliance. Those affected, should restrict their computer, cordless phone and cell phone use.

- **Extreme overall weakness that impedes normal talking or eating.**

  Stage 3D sufferers are normally locked in an advanced, overall catabolic state, and muscle mass decreases as weakness progresses. Weight loss becomes a major problem. This in turn triggers further loss of appetite as the body tries to slow down to conserve energy. This unstable positive feedback loop system is undesirable and a clear sign of a body in deep trouble. Talking becomes stressful. One feels drained after a simple phone call. Eating food is draining, because the mere action of chewing food may require energy that the body does not have. Those at this state are truly in a living hell.
• Extreme and persistent constipation requiring enema to empty bowels.

This is quite common in this phase. The body, in its best attempt to conserve energy, slows down all nonessential functions. As gastric motility slows, constipation becomes the norm. This forms a vicious cycle. In addition to being uncomfortable, bowels not emptied properly can lead to toxic build up which worsens this phase of AFS. Enemas may be required to help emptying, but this can worsen the already slow bowel movement over time, as the bowels get lazy with repeated and persistent enemas.

• Extreme sensitivity to chemicals in common household items such as perfume, shampoo, and other oil-based products.

This usually occurs when using products containing petroleum based carbon compounds with chemical structures similar to estrogen (also called xenoestrogen). We recommend using simple organic compounds instead. For example, use vinegars as disinfectants, and clean vegetables with ozonated water.

• Fatigue worsens with small dosages of steroidal medications such as Cortef® or Florinef®.

While using steroidal medication in severe cases of Adrenal Fatigue Syndrome may be considered, these medications are not universally well tolerated. For some, this type of medication is helpful, but it usually takes a prolonged adjustment period before the therapeutic dose is reached. In others, the medications may be rejected outright, and they might trigger an adrenal crash. Careful titration is absolutely needed, but only under the guidance of a skilled healthcare provider. We will have much more to say about this in Chapter 22, Tools of Last Resort.

• Amenorrhea (absence of menstrual period).

Amenorrhea is the norm for many women during this phase, because the body continues to selectively down regulate any nonessential functions for survival. Women who still have menses might experience irregular cycles and light menstrual flow. They commonly have PMS related symptoms from day 4 to day 14 of the menstrual cycle, as well as the days surrounding the onset of menses. The body seems to be struggling to maintain hormonal normalcy amidst a very challenging environment. Regular menstruation might return as the body recovers, and indeed, can be seen as a sign of adrenal recovery.

• Extreme sensitivity to vibration.

Those traveling in a car on a bumpy road may find this challenging. Only a few minutes might be tolerated, with frequent yawning and shortness of breath. We do not know the exact mechanism that triggers this.
Reversal of the twenty-four hour saliva cortisol curve pattern may occur. This phenomenon occurs from time to time, with unknown etiology. Here, the cortisol to DHEA ratio is generally high.

Positive Feedback Loop—The Final Cascade Down

During Stage 3D, positive feedback loops of the autonomic nervous system (ANS) that are inherently unstable are now in full force. They may have already been activated in earlier phases, but the clinical presentations tend to be milder when compared to this phase. These inherently unstable loops are the leading causes for the final breakdown of the body. For example, over stimulation of the AHS and SNS in Stage 3C can lead to rapid and irregular heart rate. Cardiac output may be compromised. The ability to deliver the proper amount of blood and oxygen to the body can be reduced. In severe cases, this can result in the onset of heart failure. In Stage 3D, such heart failure will in turn trigger more SNS and AHS stimulation, and thus propel the viscous cycle downward. If not resolved, the ultimate picture is one of clinical collapse.

Positive feedback loops that often play a part in worsening paradoxical reactions are already common as Stage 3 progresses. In Stage 3D, this can become amplified and exaggerated. Many try to aggressively detox or increase nutritional supplementation. Even if well-being improves in the short term, the results are often transient and usually fail over time. The body appears to reject every external effort to support the adrenal glands.

Without question, this period demonstrates the reality of the unpleasant and unpredictable paradoxical responses. Traditional dietary approaches also are seldom helpful, and the clinical outcome over time is often blunted and may fail if the body continues to decompensate. In such a case, restoring equilibrium should be the key focus. The best strategy of reversal, therefore, involves first breaking the positive feedback loop and allowing the system to stabilize.

The Living Dead

During Stage 3D, sufferers usually become very frustrated as they are left to self navigate. Incredibly, laboratory tests continue to be normal, but in this stage the body is literally falling apart internally. Sufferers at this stage are often incapacitated and frequently refer to themselves as the living dead, existing, but not really living normally.

Progression to 3D from earlier phases can be gradual or abrupt. It is not uncommon to see a stressful event (e.g. death of a loved one, excessive exercise, overwork, medication intolerance, excessive overload of steroids from medications, and
infectious processes, such as insect bites or pneumonia) overwhelm the already decompensated and constitutionally weak adrenals. In these situations, the descent into 3D can be rapid, even occurring within days or weeks.

Self navigation is not for Stage 3D. Unless the vital signs are unstable, laboratory tests usually do not help but simply add to the confusion. Without timely reversal, the natural progression of Stage 3D conditions to cause further decompensation and, ultimately, collapse. It is possible to improve with a comprehensive nutritional recovery program, but this requires considerable patience, with no guarantee of success. It may take months just to stabilize such a damaged body before any reversal can begin.

If you think this profile fits you, then please refer to Appendix A for guidelines for finding a practitioner to help you. That is your biggest task.

**Key Points to Remember**

- The level of key adrenal hormones such as cortisol or aldosterone fall below the level needed for normal basic adrenal function, but this is yet to be classified as severely pathological by conventional medical standards.
- The body is in full survival mode. The focus is to maintain all essential functions, while turning off all nonessential functions.
- Symptoms of fatigue and dysregulation become extreme. One is usually bedridden most of the day, and ambulatory help is needed to carry out normal daily chores and self care functions.
- Extreme sensitivity to all medication and nutritional supplements is the norm.
- Almost all attempts to jump start the adrenals that were previously successful backfire, and the body enters a shutdown mode to conserve remaining energy.
- Symptoms include extreme fatigue, extreme constipation, extreme food sensitivity, and extreme paradoxical reactions to nutrients and medications.
- Clinicians give up and patients are released to self navigate.
Chapter 7

Typical Adrenal Fatigue Syndrome and Crash Progression

By the time most women and men come to us for help, they are already in advanced stages of Adrenal Fatigue Syndrome. Many are surprised at the extent of damage done to their bodies, but few are surprised if we ask them to take a step back and do a detailed personal life history. Over the years, we’ve found that only a minority of sufferers developed Adrenal Fatigue Syndrome due to acute stressful events, such as accident, surgery, infection, and emotional traumas. Most have had signs and symptoms of AFS for many years and even decades, but have ignored them for far too long. Acute events merely serve as triggers of adrenal crashes more often than not.

A typical picture emerges, and you need to understand this. It’s really quite simple: Your body behaves logically. Any history, while not 100 percent predictive of the future, often indicates what is likely to happen ahead. A thorough knowledge of AFS progression will help you anticipate and prepare for what may be coming ahead. Now that you understand the physiology behind AFS, especially the crashes, we think you will find this discussion vital.

We often reiterate that in Stages 1 and 2, most people experience symptoms, including fatigue, but recover quickly and never realize that Adrenal Fatigue Syndrome was a factor. In fact, except in the cases of extreme stress and rapid onset of Adrenal Exhaustion, most patients realize they have experienced many crashes and recoveries along the way to Stage 3 and its phases. A crash in Stage 1 is hardly noticeable, while a crash in Stage 3C will invariably land you in bed for days. Not all crashes are the same. Here, we examine more closely the nature of these crashes in each stage (previously described in this book).

The following diagram shows the typical general progression of Adrenal Fatigue Syndrome over time, with steady deterioration during the generally asymptomatic Stages 1 and 2. This is followed by a rapid and functional decline in Stage 3, which is especially severe in Stage 3C. If unattended, the natural progression is likely to end in adrenal failure. Note that the exact progression varies from person to person with wide variations in intensity and timing. Furthermore, multiple crashes usually occur along the way, and the entire progression typically lasts a decade or more.

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Figure 14. Typical Adrenal Fatigue Syndrome Progression

- Multiple asymptomatic short crashes and fast recoveries facilitated by coffee, sugar fix, and rest. This is stage 1 Adrenal Fatigue (alarm response) that can last years.
- First symptomatic crash with unbearable symptoms as the crash penetrated the adrenal symptoms threshold. Hypoglycemia, fatigue, insomnia, irritability, and anxiety are common.
- Even after recovering from stage 2 Adrenal Fatigue crash, the energy levels are well below that of the previous highs.
- Gradual deterioration of the adrenal function over time with multiple crashes and recoveries only to be followed by further crashes as the adrenals were not given the proper tools to heal themselves.
- As symptoms persist without significant improvement, thyroid and other hormones, as well as strong adrenal stimulatory compounds are prescribed in an effort by the practitioner to increase the body’s energy level.
- Medication has to be increased in order to keep the same energy level as the body’s responses are blunted with time.
- Multiple crashes, some of which are major, as the body has reached its maximum stimulatory level. With a stressful event the body enters an acute state of decompensation.
- Entering Stage 2 Adrenal Fatigue (resistance response). Self-help is started with more coffee and various stimulatory vitamins, herbs, and glandular.
- Entering Stage 3 Adrenal Fatigue (adrenal exhaustion) where symptoms become persistent and constant. Physicians’ help is sought and normally told all is well. Anti-depressant and sleeping pills may be prescribed.
- Entering Stage 3C Adrenal Fatigue (dis-equilibrium). Severe fatigue, heart palpitations, hypoglycemia, low blood pressure, insomnia, joint pain, etc. are common.
- A long stabilization period may be achieved, but energy level remains low and symptoms unresolved as the body ages. Paradoxical reactions become common.
- Sudden crash from the smallest stressor can occur.
- Slow recovery with frequent setbacks and crashes along the way. The body goes into wild swings of metabolic, hormonal and neurological imbalances as the autonomic nervous system is activated involuntarily and the body is flooded in a sea of adrenaline. The body is "wired and tired".

*This graphical representation is based on clinical observations and is for educational purposes only. It is not intended, nor qualified, to be used as a diagnostic tool. Actual progressions vary greatly and depends on each individual person.
Stage 1 Adrenal Fatigue Syndrome
(Alarm Reaction, points 1-3 on the chart, previous page)

In this stage, the body is alarmed by stressors and mounts an aggressive anti-stress response to reduce stress levels. Brain norepinephrine is activated and the mind is put on alert. Unfortunately, this subclinical state is seldom recognized as a pathological condition. Blood sugar levels become imbalanced, resulting in low energy and usually remedied with quick fixes, such as soda drinks, energy potions, and high carbohydrate foods such as pastries and other sweets. Those who require coffee to start the day may already be in this stage but are unaware of it. If a major crash occurs, recovery usually takes a few days or weeks at most and full recovery is achieved. Crashes in this stage usually go unnoticed and are only evident in retrospect.

Stage 2 Adrenal Fatigue Syndrome (Resistance Response, points 3-5)

With chronic or severe stress, the adrenals eventually become unable to compensate. Those in this stage still carry out normal daily functions, but the sense of fatigue is pronounced at the end of each day as the body needs more rest than usual to recover. Despite a full night’s rest, the person often doesn’t feel refreshed in the morning. Anxiety and irritability begin to set in. Insomnia becomes more common, as it takes longer to fall asleep, and waking in the night several times is common. Infections become more recurrent. PMS and menstrual irregularities surface, and symptoms suggestive of hypothyroidism (such as a sensation of feeling cold and a sluggish metabolism) become prevalent. Those who require multiple cups of coffee to sustain them throughout the day may well be entrenched in this stage without knowing it.

Compared to Stage 1, the frequency of minor and major adrenal crashes is higher. The intensity is also increased. The Adrenal Symptoms Threshold (AST) has been penetrated on the downside. A mild degree of adrenal symptoms are usually present before the crash, but not always. During the adrenal crash, these symptoms worsen and may be exaggerated, but they’re still manageable.

At this stage, many individuals recover fully with no symptoms after the crash as they rise above the AST, but not all are so fortunate. A significant number of people remain symptomatic below the AST after recovery. They might manifest symptoms that are slightly worse than the state they were in before the crash. These crashes are often what bring sufferers to their physicians for the first time. Medical workups are usually normal.

Crashes associated with Stage 2 Adrenal Fatigue Syndrome are characterized by a higher intensity of symptoms compared to crashes associated with Stage 1. To start,
the pre-crash energy level is lower than Stage 1 Adrenal Fatigue Syndrome at the baseline. At the height of the crash, the adrenal function usually descends and penetrates the AST. Debilitating symptoms start to appear, including anxiety, insomnia, and low blood sugar. As with crashes associated with Stage 1 AFS, each crash and recovery cycle end at an adrenal function status that is slightly compromised. This is a gentle downward cascade of functions resembling a waterfall or a series of steps going down. The duration of the recovery phase is usually longer when compared to that experienced in Stage 1.

**Stage 3A Adrenal Fatigue Syndrome**  
*(Early System Dysfunction, points 6-9)*

As the body enters Adrenal Exhaustion (Stage 3), the clinical picture drastically worsens. Mild symptoms characteristic of Stages 1 and 2 Adrenal Fatigue Syndrome continue to worsen and become clinically evident. Symptoms become persistent or chronic, including any of the following:

- The slightly elevated blood pressure now becomes low throughout the day.
- Mild musculoskeletal pain turns into chronic myalgia around the clock.
- Frequent recurrent infections are the norm in comparison to intermittent infections.
- Occasional mental feeling of blues becomes mild depression.
- Sleep patterns become more disrupted as insomnia becomes chronic.
- Fatigue that usually occurs during the end of occasional stressful days becomes an everyday event.

We see the ability to carry out normal daily activities moderately reduced. Most people are exhausted after a full day’s work. However, not all organs are dysfunctional to the same degree at the same time. The organ system that is constitutionally weakest is the first one to decompensate, while another organ system appears to be intact. The HPA axis dysregulation is responsible for many of these symptoms.

Minor crashes become increasingly common, occurring once every few weeks. Major crashes usually occur farther apart. Symptoms are prevalent pre-crash, and because most are longstanding, most sufferers have adapted to them, although they live at a lower energy baseline level. During the adrenal crash, the symptoms worsen. Even after recovery, the body remains symptomatic, and below the AST most of the time.
Stage 3B Adrenal Fatigue Syndrome  
(Hormonal Axis Imbalances, points 9-10)

The endocrine system in our body is linked hormonally in a series of axes for optimal function. Dysfunction in one system invariably affects the others, leading to a cascade of decompensation as the body weakens. In this phase, hormonal axes such as the ovarian-adrenal-thyroid (OAT) axis in women and adrenal-thyroid (AT) axis in men are particularly compromised.

When these axes become imbalanced, the adverse feedback loop creates a vicious cycle of cascading decompensation involving multiple organ systems at the same time. In women, this could typically involve symptoms associated with low thyroid, progesterone, and cortisol hormones. In the male, the adrenal-thyroid axis may be compromised. Sufferers’ physical and emotional states continue to deteriorate and they enter into a state of confusion. By that we mean they are unable to logically dissect the myriad systemic manifestations of multiple hormonal axes imbalances.

Compared to those experiences in Stage 3A Adrenal Fatigue Syndrome, crashes are usually more intense and more frequent as the adrenal reserve is depleted. It is not uncommon to have minor crashes every few weeks, and major adrenal crashes every few months. The body never fully recovers to a point that the energy is consistently above the AST at any point in the crash and recovery cycle.

Stage 3C Adrenal Fatigue Syndrome  
(Disequilibrium State, points 10-13)

The body gathers steam as it continues its downward path of impaired functions. Gradually, the body becomes severely compromised in trying to maintain the fine controls of homeostasis. Therefore, normal equilibrium is lost. The body will try its hardest to maintain equilibrium. The autonomic nervous system (ANS) is now put into overdrive as a way to overcome perceived danger and impending doom. The body is flooded in a sea of norepinephrine and epinephrine. However, the compensatory response systems can become dysregulated. Along with damaged receptor sites, impaired metabolic and detoxification pathways exist in what is now a low clearance state, leading to paradoxical and exaggerated responses.

Clinical manifestations include swings in blood sugar levels, with reactive hypoglycemia being the hallmark, along with fragile and low blood pressure, postural hypotension, and the inability to remain standing for a prolonged period of time. Reactive sympathoadrenal responses include heart palpitations, night sweats, and reactively driven anxiety followed by depression. Normal activities are usually very much restricted.
Crashes that occur in this phase are fast and furious. Minor adrenal crashes can occur every few days, and major ones are not far behind. There is a roller coaster ride of ever worsening symptoms. It is not unusual for one to go from a minor crash immediately into a major crash before the minor crash has even completed its recovery. A state of constant fatigue exists, with severe energy depletion. The highest rate of functional decline occurs at this phase. A major crash can be very scary and may require trips to the emergency room. The recovery phase for Stage 3C crashes can be many more times longer than that of Stage 1.

**Stage 3D Adrenal Fatigue Syndrome**
*(Near Failure, points 14-15)*

As the body’s various hormones, such as cortisol and aldosterone, fall below the minimum required reserve for basic normal function, the body continues to down regulate the amount needed in order to preserve what is on hand for only the most essential body functions. This down regulation further reduces cortisol output, exaggerating a vicious downward cycle. The body may not be able to tolerate steroids, or the response may be blunted. Even at low doses, normal nutrients are often systemically rejected by the body. Unstable hormonal positive feedback loops are activated which invariably worsen the condition.

Those who are in this stage often live in the hopeless state of constant crashes. The body is too drained to mount a productive response. Adrenal crash symptoms are usually extreme. Minor crashes can be intermingled with major crashes. Emergency room visits are common due to unstable blood pressure, irregular heart rate, and severe anxiety with a sense of impending doom. Sufferers are usually bedridden and require help to carry out daily self care and minimal chores.

In addition to a much longer recovery time compared to Stage 3C, sufferers remain symptomatic well below the AST throughout almost the entire crash and the recovery experience. Those in late Adrenal Exhaustion have a very low adrenal pre-crash reserve at baseline. Compared to earlier stages, stress triggers can be something that would not have triggered a crash in early stages. This may be a longer than usual walk or inadequate fluid intake. The body is much more sensitive to stressors as adrenal weakness progresses.

Fortunately, most adrenal crashes, even in advanced states, can be managed with the right tools and approach (discussed later in Part II). In the next chapter, we get a glimpse of what happened in the life of one woman when Adrenal Fatigue Syndrome advanced into Adrenal Exhaustion and remained unrecognized and untreated for many years.

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Key Points to Remember

- The typical Adrenal Fatigue Syndrome sufferer goes through multiple crashes and recovery cycles over decades as the body slowly decompensates.

- In each stage of Adrenal Fatigue Syndrome, crash and recovery takes on different characteristics, durations, and intensities.

- Precipitating events often act as major triggers for each crash.

- Most AFS sufferers can look back at their history and see a progression of symptoms.

- Generally speaking, as AFS progresses, crashes become more frequent and more intense. The trigger needed to precipitate a crash reduces. Recovery also becomes less strong and takes longer as AFS advances.
Seven Adrenal Recovery Mistakes

By this time, you know that most cases of Adrenal Fatigue Syndrome are mild (Stages 1 and 2), lasting a few days or weeks, with eventual full recovery. This generally occurs without awareness that AFS is involved. A minority of people find recovery a challenge. Their symptoms last longer than usual; they eventually improve, but never fully recover. Still, a smaller number of people slowly decompensate and their condition gets worse with time. These are the individuals who slowly slip into advanced stages of AFS (Stage 3 and beyond).

When sufferers experience frequent episodes of Adrenal Fatigue Syndrome symptoms that increase in severity and duration, we consider this a sign of recovery failure. The body has a built in, self repair system, but it is often not fully engaged in the recovery process. We see many reasons for this failure, and we discuss seven of the most common below. Keep these in mind as you embark on your search for help.

Mistake 1: Following Advice from Inexperienced Healthcare Providers

As they embark on a journey of recovery, most patients quickly realize that most mainstream physicians are not well educated about AFS. On top of this, modern medicine has a tendency to lean heavily toward laboratory-based approaches to healing, rather than narrative, body-based approaches. In addition, we do not yet have accurate and foolproof laboratory testing for Adrenal Fatigue Syndrome. Paradoxically, the more advanced the adrenal weakness, the lower the clinical correlation with laboratory results.

To untrained physicians, the maze of complaints is a challenge. Dysfunctional adrenals affect virtually every system of the body including the central nervous system, cardiovascular system, peripheral nervous system, hormonal system, and gastric system, just to mention a few. Therefore, practitioners need a thorough understanding of neurology, cardiology, endocrinology, and psychiatry. Since most physicians specialize today, their training is on a narrow, clinical focus, and they often lack experience in the multiple disciplines necessary to fully comprehend AFS in its broadest sense.
Unfortunately, treating symptoms becomes the standard of care instead of focusing on the root problem. This is why patients often end up with myriad prescriptions, including antidepressants and antianxiety medications, along with other agents that treat symptoms. Many different specialists often treat sufferers separately for digestive disorders, gynecologic disorders, psychological symptoms, allergies, and so forth.

The number of physicians with true expertise in advanced Adrenal Fatigue Syndrome invariably gained their expertise from years of clinical experience. In severe cases, full recovery can easily take a year or more. Inexperienced practitioners are often misled by laboratory tests and preoccupied with treating symptoms. These practitioners find it difficult to handle other than the most mild and straightforward cases of AFS and usually give up when it comes to advanced cases. Unfortunately, sufferers are unaware of these limitations and are misled into thinking they’re on the right track. Disappointed, they eventually self-navigate as their symptoms get worse. Finding the right healthcare professional is your greatest challenge and task. Appendix A offers some tips on how to find the right physician for you.

**Mistake 2: Excessive Use of Prescription Drugs and Medications**

We live in a world where symptoms are often classified as diseases. Therefore, controlling symptoms is often confused with “curing” the disease, even when the condition is chronic. In the case of AFS, this common approach frequently ends in disaster. Masking pain, for example, is not the same as curing the condition that causes the pain. The symptoms of AFS are like pain, they’re signals that something is amiss. But suppressing symptoms doesn’t work and only punishes the body. The body responds by punishing with worsening symptoms.

The logical approach is to give the body the tools to heal itself, while monitoring the symptoms and using them as a barometer to evaluate progress toward healing. Sadly, this method is rarely deployed. Suppressing symptoms with various prescription medications is the norm. Unfortunately, most medications have side effects. For example, the dozens of common side effects of antidepressants alone include dry mouth, blurred vision, constipation, sleep disruption, headaches, nausea, loss of libido, and agitation. We can multiply this by the number of medications many individuals take simultaneously. Needless to say, this practice stresses the liver and the adrenals, and many with Adrenal Fatigue Syndrome never fully recover when their treatments are based on prescription medications, which can range from steroids to antianxiety drugs to sleep medications.
Mistake 3: Over Reliance on Laboratory Testing

As we learned in Chapter 11, Diagnostic Tests—What You Need to Know, diagnostic testing is severely limited when it comes to Adrenal Fatigue Syndrome. It is common to have significant AFS symptoms, but the lab tests are within the normal range. We often see lab results that confuse and mislead. Laboratory interpretation is challenging even for experienced clinicians. Physicians often find themselves chasing a moving target. In advanced AFS, the more we rely on laboratory tests, the more confused we get because of multiple inconsistencies in the correlation between test results and symptoms. As a result, patients are often subjected to numerous trial and error protocols undertaken by physicians with the best intentions but who were clinically misled by laboratory tests. This approach further weakens the body’s already low adrenal function. Many come to us confused and frustrated as a result.

The body’s signs and symptoms are far superior in gauging adrenal weakness than laboratory test results performed with current technology. The gold standard remains a good and comprehensive narrative history of the sufferer taken by an experienced clinician. Laboratory tests can be helpful when properly used.

Mistake 4: Improper Use of Nutritional Supplements

You likely know that natural compounds differ from prescription drugs in many ways. Prescription drugs usually follow a well defined and highly predictable efficacy curve, meaning that the desired response is usually generated within a predetermined range of therapeutic dosing. The body does not have a natural, built-in system of metabolizing non-natural compounds such as synthetic drugs, so with high dosages, toxicity results. Similarly, when natural compounds are used inappropriately, recovery is not only impeded, but the condition worsens over time. In these situations the compounds do more harm than good. This is one of the greatest mistakes made among those who embark on self-guided and nonprofessionally guided programs, especially if the Adrenal Fatigue Syndrome is advanced. (See Chapter 19, Nutritional Supplements for Nutritional Fatigue: An Introduction) for more detailed information about the use of natural compounds.)

Mistake 5: Failure to Recognize Paradoxical and Unusual Reactions

When medical treatments, usually with a drug, have the opposite effect of what we expect, we call that a paradoxical reaction. For example, if a sleep medication causes worsening insomnia, we call it a paradoxical reaction. Likewise, if a sedative causes hyperactivity, that’s a paradoxical reaction. We see this when steroid drugs worsen AFS instead of helping. Experienced clinicians watch for these abnormalities.
Although we don’t know the reason, paradoxical reactions are generally more prevalent with natural compounds. We do know that one person’s beneficial natural compound can be toxic to another person. This can occur over time. In some cases, however, the body rejects these nutrients from the beginning. Instead of feeling better with an energy boost, the person feels worse and an adrenal crash could result.

The more advanced the AFS, the more paradoxical and unusual reactions tend to surface. The body is caught in a cascading downward state, with exaggerated responses mediated by hormonal imbalances in a positive feedback loop platform, along with its own violent attempt to rebalance itself. Such paradoxical reactions include:

• Severe fatigue but feeling wired at the same time.
• Fragile blood pressure that fails to normalize in quiet times.
• Reactive hypoglycemia despite metabolic medications to stabilize blood sugar.
• Palpitations made worse with cardiac medication designed to reduce irregular heart beat.
• Sudden anxiety attacks while on sedatives.
• Worsening fatigue with natural compounds that helped before.

While some of these symptoms can be due to drug intolerance, liver clearance problems, autonomic nervous system dysregulation, and side effects of natural compounds, many paradoxical reactions occur with no apparent medical logic. However, these paradoxical reactions are important warning signs of our body we need to take heed of. Failure to recognize such reactions can contribute to delayed or failed recovery.

Mistake 6: Failure to Recognize Multi-organ Involvement

Failure to recognize the multi-organ involvement associated with Adrenal Fatigue Syndrome often leads to a narrow focus that makes the condition worse off over time. As previously explained, the adrenal glands are regulated through the hypothalamic-pituitary-adrenal (HPA) axis. The adrenals themselves are then intricately connected to many other organs in a variety of axes. In women, one such intricate relationship is called the ovarian adrenal and thyroid (OAT) axis (Chapter 8, Stage 3B—Hormonal Axis Imbalances). These three organs are intimately codependent on each other for optimal function. In men, the adrenal and thyroid are connected.
In the case of the OAT axis, when a medication alters one of the organs’ 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 the ovarian hormones, and reduced ability to deal with stress and worsening fatigue, a function of the adrenals.

When multiple organs are involved and decompensate concurrently, the body’s ability to recover is made much harder. For example, processing and assimilating nutrients becomes compromised, leading to reduced absorption of nutrients in the GI track, producing digestive symptoms. Liver function is reduced, although laboratory test results might be in the normal range. If not processed and metabolized properly, good nutrients become toxic, producing toxic metabolites that circulate in the body. If not properly cleared, these toxic metabolites can lead to brain fog, joint pain, skin rashes, allergies, muscle discomfort, and multiple chemical sensitivities among many other symptoms.

When the adrenals are not in optimal condition, no organ system is spared dysfunction. Therefore, an adrenal recovery program that does not factor in other organ involvement invariably fails as the condition worsens.

**Mistake 7: Lack of a Comprehensive Recovery Program**

The body is a closed ecosystem with a built in capability to self repair. If given a chance, it normally can recover on its own with the proper nutrients, lifestyle, dietary changes, and time. Recovery strategies focusing on this comprehensive approach often produce excellent results, even in severe cases, in a short time. By contrast, strategies that focus on controlling the symptoms and getting quick results often fail. For maximum recovery speed, the root cause, such as removal of stressors, improper dietary habits, and improper use of nutritional supplements, needs to be addressed through a comprehensive program.

The most effective recovery program should incorporate the following (which we discuss in detail later in this book):

- A customized nutritional supplementation program based on the person’s internal needs and sensitivities.
- A customized dietary program based on the sufferer’s metabolic needs.
- A customized lifestyle program including exercise based on the person’s constitution and energy reserve.
The above three-pronged approach can produce dramatic and quick results if carried out under the supervision of an experienced clinician.

By now you realize that AFS is much more complicated and debilitating than you might have thought. Fortunately, with an individualized recovery plan, most patients can and do recover.

**Key Points to Remember**

The 7 most common recovery mistakes are:

- Following advice from an inexperienced healthcare provider.
- Excessive use of prescription drugs and medications.
- Over reliance on laboratory testing.
- Improper use of nutritional supplements.
- Failure to recognize paradoxical reactions.
- Failure to recognize multi-organ involvement.
- Lack of a comprehensive recovery program.
Appendix A

Finding the Right Practitioner

The right healthcare practitioner can change your life. In the case of Adrenal Fatigue Syndrome, this is usually the most critical piece of the puzzle. Why? Because the vast majority of those with AFS experience myriad convoluted symptoms that confuse all but the most astute clinicians trained in this condition. It’s essential to know what each symptom means, along with its significance. As you can see from the case studies, the right professional guidance can mean the difference between successful recovery and persistent failure.

Due to the general lack of Adrenal Fatigue Syndrome expertise among conventional and even alternative health practitioners, finding the right practitioner is easier said than done. Those with advanced Adrenal Fatigue Syndrome face the greatest challenges, as many have already been abandoned by conventional medicine and left to self-navigate.

It’s worth spending the time to find the right clinician. Generally speaking, he or she should be an open minded and nutritionally oriented health professional. Additional clinical experience in endocrinology, cardiology, psychiatry, and neurology is beneficial, along with knowledge of using natural compounds in a holistic setting.

Insist on someone who can individualize your care, and look for someone who can examine diagnostic tests but also see beyond them to discern how you feel. Seek the clinician who believes that managing your adrenals requires a comprehensive approach, including modifying your diet, lifestyle, and exercise; this person’s approach to natural compounds is both gentle and systematic and non-stimulating. Remember that a wrong approach can worsen your condition over time. In today’s managed care and specialized environment, this is not an easy task, but neither is it impossible.

The Doctor Interview

You are entitled to ask a doctor key questions before making an initial appointment, and then based on the answers, ask yourself if this person is receptive to new ideas. What is his or her philosophy on how stress can affect the body? This will give you clues as to whether this doctor is holistic or conventional.
Later, when you talk with this doctor, does he or she clearly communicate the reasons you feel the way you do? An experienced doctor will generally have little problem tying in your various symptoms and giving you a comprehensive explanation. You should be able to receive direct answers to your questions in a way you can understand. This is part of being patient-oriented.

You can also ask about the doctor’s philosophy of the adrenal glands as a key to the body’s overall well-being and your symptoms of fatigue, along with other organ systems associated with your complaints, during the investigation. These questions help you indirectly gauge not only the doctor’s knowledge of the adrenal system, but the more subtle understanding of adrenal function and Adrenal Fatigue Syndrome.

How to Best Communicate With Your Doctor

A good relationship is a two-way street, so the more clearly you communicate your problems, the easier it is for the doctor to address the issues. Here are simple tips to facilitate good communication:

• Have confidence in yourself, but do not show either an overly aggressive or passive attitude.

• Keep a journal of your health-related events and symptoms, noting when they come on (time of day or relating to an event or the menstrual cycle, for example), how they affect you, how you feel, and how and when you recover.

• Write down questions ahead of your appointment, so you can ask good questions and make the most of your appointment time.

• Trust your instincts. Your body is always right. Persist in finding the care you deserve. Don’t settle for less.

Although we realize many doctors do not welcome patient-generated research, and some even become annoyed when patients bring them information, we recommend that you help your doctor stay informed. Print out articles relevant to your condition that you believe may help your doctor understand your situation, and submit these to your doctor for perusal ahead of time. Our Adrenal Fatigue Center at www.DrLam.com contains numerous articles that we constantly update. You can direct your doctor to our website. Forward thinking doctors, the real visionaries, thank us for providing this information online so they can learn and better serve their patients.
You have also benefitted from this book and other articles. You can better explain and describe your symptoms when you know more about your body and various conditions. This in turn helps your doctor help you.

If your doctor does not understand or cannot explain to you what is happening with clear confidence, chances are you need to consider finding another healthcare professional.

**Investigate Other Options**

Here are several tips if you cannot find the right practitioner:

- Connect with others who’ve had similar symptoms and investigate what they did to overcome their dysfunction. Do be careful not to draw conclusions too quickly, however. What works for one person may not work for another. You may be able to find a doctor through those who have been helped.

- Use the Internet. Search Adrenal Fatigue Syndrome and study relevant sites. Focus on educational sites that offer scientifically based information. Our site www.DrLam.com is a public educational website that contains the most easily searchable complete library of material on Adrenal Fatigue Syndrome on the web. Many articles on Adrenal Fatigue Syndrome not present in this book are available online, along with the latest news, FAQs (frequently asked questions), and an archive of questions many have asked through the years. You’ll also find video and audio presentations of lectures on Adrenal Fatigue Syndrome. Those who like to be kept up to date on the latest news on this topic can sign up for our free electronic newsletter.

- Be wary of Internet forums because views expressed are often skewed and not objective in nature. What works for one person can in fact be toxic for another. Be skeptical of anyone who purports to have simple, quick fix or breakthrough solutions. Watch out for those who post angry messages or who are overly active online. These individuals may have hidden agendas or unresolved psychological or undisclosed physical issues well beyond AFS. Finally, be careful of one-size-fits-all approaches; these seldom work except for the mildest cases.

- If you are not sure whether you have Adrenal Fatigue Syndrome, or if you would like an assessment on the degree of your adrenal function, take
our Three Minute Test in this book (Appendix C) or online at www.DrLam.com.

- If you have specific questions about your symptoms or condition, write to us directly from our website at www.DrLam.com. Each question is individually answered privately and in confidence.

Fortunately, travelling is not usually required in order to seek help. We serve clients all over the world. If you cannot find a practitioner with whom you are comfortable, or if you have no one to turn to, call us. (For details see our website.) Our telephone-based nutritional coaching program is an individualized one-on-one program designed to facilitate the fastest possible recovery using natural measures. It incorporates many principles and techniques discussed in this book.
The glycemic index (GI) is a measure of how much blood sugar stress a food creates. Controlling blood sugar is one of the pillars in a successful anti-aging diet, and high blood sugar is a direct reflection of high sugar intake. Therefore, it’s important to know what foods are low in sugar.

Below is a table of common foods and their glycemic index. To reduce blood sugar stress, concentrate on foods with an index at or below 70. This will help create a more even flow of glucose into the blood. If you are eating high glycemic index food like white bread, always try to pair it with a low glycemic index food. If foods are mixed, the resulting index will be between the high and low values.

Table 4, Glycemic Index Table, below lists common food products and their actual GI values. These numbers use glucose as a baseline, which is given a GI of 100. All the other values are relative to glucose.

Recommended: GI <70; Avoid: GI >70; If Diabetic or hypoglycemic: avoid GI >60

<table>
<thead>
<tr>
<th>Legumes</th>
<th>Grains</th>
<th>Pastas</th>
<th>Bread Products</th>
</tr>
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<tbody>
<tr>
<td>Baked Beans, canned</td>
<td>Barley, pearled</td>
<td>Angel Hair 45</td>
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<td>Buckwheat (kasha)</td>
<td>Bean Threads 26</td>
<td>French Bread 96</td>
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<td>Black Eyed Peas</td>
<td>Bulgar</td>
<td>Gnocchi 67</td>
<td>Kaiser Roll 73</td>
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<td>Butter Beans</td>
<td>Couscous</td>
<td>Pastas, brown rice 92</td>
<td>Melba Toast 71</td>
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<td>Cornmeal</td>
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<td>Pita Bread 58</td>
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<td>Pastas, whole grain</td>
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<td>Star Pastina</td>
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<td>Vermicelli</td>
<td>Rye Bread, whole</td>
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<td>Graham Crackers</td>
<td>Corn Chips</td>
<td>Stuffing</td>
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<td>Fried Pork Rinds</td>
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<td>Rye Crispbread</td>
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<td>White Bread</td>
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<td>Cornflakes</td>
<td>All Green Vegetables</td>
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<tr>
<td></td>
<td></td>
<td>0 - 30</td>
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</tbody>
</table>

| Snacks, Misc.           |                         |                         |                             |
|                         |                        |                         |                             |
|                         |                        | Snacks, Misc.           |                             |

| Crackers                | Corn Chips              |                         |                             |
|                        | Fried Pork Rinds        | Olives                  |                             |
|                        | Peanut M&M’s            | Peanut M&M’s            |                             |
|                        |                         |                         |                             |
| Fruits                 |                         |                         |                             |
|                        |                         |                         |                             |
|                        |                         | Fruits                  |                             |
|                        |                         |                         |                             |
|                        |                         | All Bran                |                             |
|                        |                         | Apple Juice             |                             |
|                        |                         | Apricots, dried         |                             |
|                        |                         | Bananas, ripe           |                             |
|                        |                         | Cantaloupe              |                             |
|                         |                         | Cherries                |                             |
|                         |                         | Grapefruit              |                             |
|                         |                         | Grapefruit Juice        |                             |

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<td>Cauliflower</td>
<td>&lt;50</td>
<td>Orange</td>
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<td>Eggplant</td>
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<td>Papaya</td>
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<td>Peach</td>
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<td>Water Chestnuts</td>
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<td></td>
<td>Yams</td>
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<td>Yellow Squash</td>
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Adapted from D.J.A. Jenkins et al., American Journal of Clinical Nutrition, Volume 34, 1981.

For Glycemic Index of 1200 foods, here is the link: [http://www.mendosa.com/gilists.htm](http://www.mendosa.com/gilists.htm)

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Appendix C

3 Minute Adrenal Fatigue Syndrome Test

Here is a checklist of common symptoms associated with Adrenal Fatigue Syndrome. Check the boxes that are applicable. See your score below and find out what you can do about it.

☐ Tendency to gain weight especially at the waist and inability to lose it.

☐ High frequency of getting the flu and other respiratory diseases that tend to last longer than usual.

☐ Reduced sex drive.

☐ Lightheaded when rising from a supine position.

☐ Unable to remember things and unclear thinking.

☐ Lack of energy in the mornings and also in the afternoon between 3-5:00 PM.

☐ Feel better suddenly for a brief period after a meal.

☐ Need coffee or stimulants to get going in the morning.

☐ Crave for salty, fatty, and high protein food such as meat and cheese.

☐ Increased symptoms of PMS for women; periods are heavy and then stop, or almost stop on the 4th day, only to start to flow again on the 5th or 6th day.

☐ Pain in the upper back or neck for no apparent reasons.

☐ Easily startled.

☐ Decreased ability to handle stress and responsibilities.
Body temperature is off balance; hands and feet feel cold, face feels warm, or hot flashes.

Unexplained hair loss.

Tendency to tremble when under pressure.

Multiple allergies such as asthma, hay fever, skin rashes, eczema, hives, and food sensitivity.

Enter the number of checkmarks you have made: ______

What does your score mean?

If your score is 4 or below, chances are you do not have Adrenal Fatigue Syndrome unless your symptoms are quite severe. There may be other dysfunction in place. Adrenal Fatigue Syndrome is unlikely to be significantly involved, although we can’t be sure without a detailed history. You can adopt many of the dietary and lifestyle recommendations in this book as they are generally conducive to good health. Group 1 and 2 nutritional supplementations (Chapters 20, First Line of Defense—Gentle Nutrients, and Chapter 21, Second Line of Defense—Glandulars and Herbs) are generally well tolerated if your doctor approves. If you do not improve within a reasonable amount of time, write to us through our website with your score and what you did. We will give you our thoughts in confidence.

If your score is 5-9, you may or may not have Adrenal Fatigue Syndrome. Many conditions mimic AFS, so if you have not already done so, visit your doctor for further medical investigation. If you are given a clean bill of health but remain symptomatic, consider Adrenal Fatigue Syndrome. The higher your score on the test, the higher your risk of Adrenal Fatigue Syndrome. You also can adopt many of the dietary and lifestyle recommendations mentioned in this book, but be cautious when it comes to nutritional supplementation, as they can worsen the condition if not properly used. If you are not sure where you stand or what to do, then write directly and privately to us online through our website (www.DrLam.com) with your score and a brief history. We’ll give you our assessment and suggestions in confidence.

If your score is 10 or above, it is imperative that you become fully educated about Adrenal Fatigue Syndrome and alert your doctor about this condition. The more severe your symptoms, the more dysfunctional your adrenal glands likely are. We do not recommend self-navigation as it often makes the condition worse over time. If
you cannot find someone knowledgeable to help you, if you fail to improve on your recovery plan, and are not sure where you stand or what to do next, then write to us directly and privately through our website (www.DrLam.com). Let us know your score, a detailed medical history, and your main complaints. We will reply to you in confidence and give you some guidance.

This free test is also available online at our website www.DrLam.com.
Typical Adrenal Fatigue Progression

1. Multiple asymptomatic short crashes and fast recoveries facilitated by coffee, sugar fix, and rest. This is stage 1 Adrenal Fatigue (alarm response) that can last years.

2. First symptomatic crash with unbearable symptoms as the crash precipitated the adrenal symptoms threshold. Hypoglycemia, fatigue, insomnia, irritability, and anxiety are common.

3. Even after recovering from stage 2 Adrenal Fatigue crash, the energy levels are well below that of the previous highs.

4. Gradual deterioration of the adrenal function over time with multiple crashes and recoveries only to be followed by further crashes as the adrenals were not given the proper tools to heal themselves.

5. As symptoms persist without significant improvement, thyroid and other hormones, as well as strong adrenal stimulatory compounds are prescribed in an effort by the practitioner to increase the body's energy level.

6. Medication has to be increased in order to keep the same energy level as the body's responses are blunted with time.

7. Multiple crashes, some of which are major, as the body has reached its maximum stimulatory level. With a stressful event the body enters an acute state of decompensation.

8. Entering Stage 3A Adrenal Fatigue (resistance response). Self help is started with more coffee and various stimulatory vitamins, herbs, and glandulars.

9. Entering Stage 3 B Adrenal Fatigue (adrenal exhaustion) where symptoms become persistent and constant. Physicians help is sought and normally told all is well. Antidepressant and sleeping pills may be prescribed.

10. Entering Stage 3C Adrenal Fatigue (dys-equilibrium). Severe fatigue, heart palpitations, hypoglycemia, low blood pressure, insomnia, joint pain, etc are common.

11. Simple recovery with frequent setbacks and crashes along the way. The body goes into wild swings of metabolic, hormonal and neurological imbalances as the autonomic nervous system is activated involuntarily and the body is flooded in a sea of adrenaline. The body is "wired and tired".

12. A long stabilization period may be achieved, but energy levels remains low and symptoms unresolved as the body ages. Paradoxical reactions become common.

13. Sudden crash from the smallest stressor can occur.


15. Adrenal failure

*This graphical representation is based on clinical observations and is for educational purposes only. It is not intended, nor qualified, to be used as a diagnostic tool. Actual progressions vary greatly and depends on each individual person.

Figure 14. Typical Adrenal Fatigue Syndrome Progression