

The Adrenal Health Guide

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We have a fast paced world that taxes our bodies to perform and produce all day long. We devalue the importance of rest and continue to drive hard towards our goals. We load up on caffeine and energy drinks to keep cranking so we “can get everything out of life.” As a result, we have an epidemic of adrenal fatigue, hormone dysregulation and chronic inflammatory conditions.

This guide is designed to help you understand how your body adapts to stress and teach you strategies to adapt more effectively. We know that the hallmark of a successful life and healthy aging is our ability to adapt to the demands of our environment.

So how are you adapting to the stressors in your life? Chances are you are not adapting as well as you could and this is costing you to function at a lower level and settle for less than optimal health and possibly costing you a lot of unnecessary suffering.

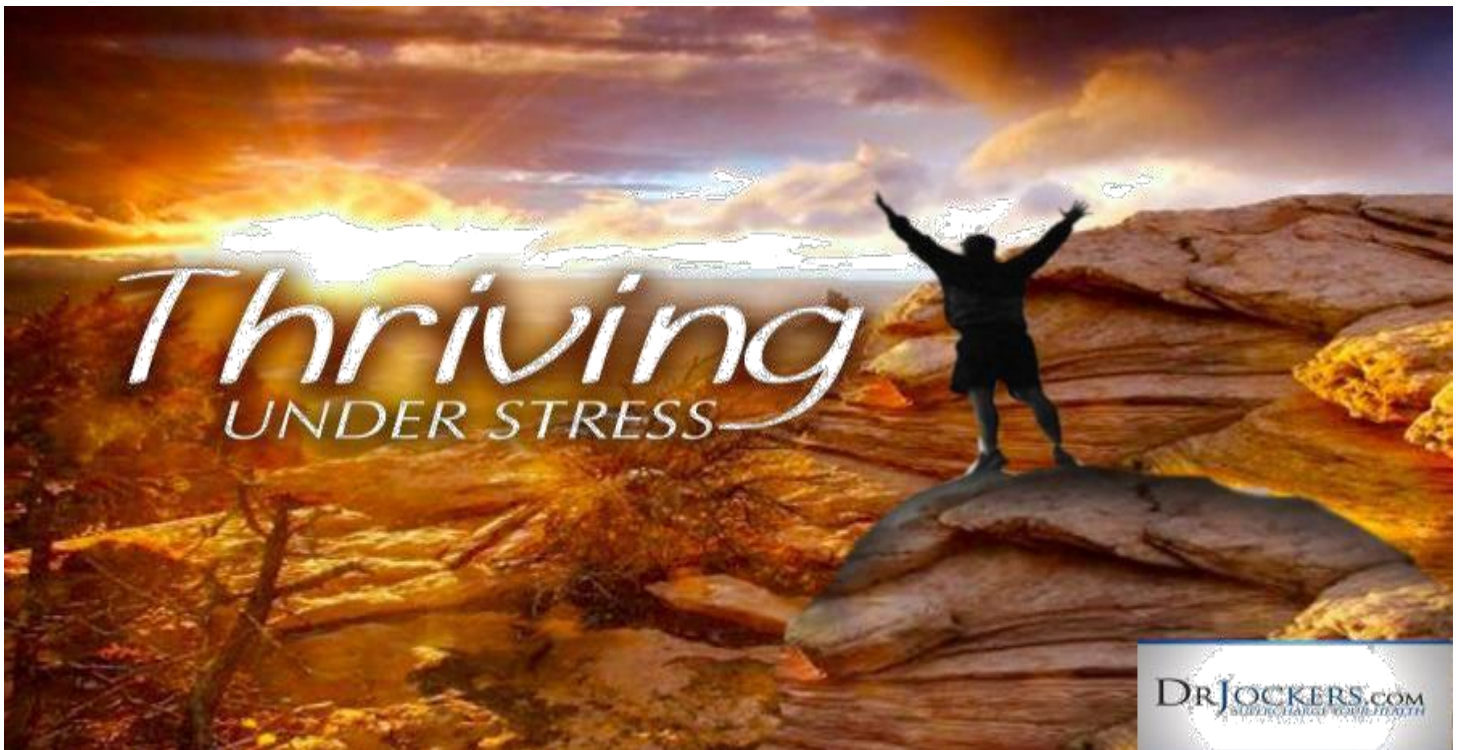
My prayer is that this guide will help you adapt stronger and live better.

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*These statements have not been evaluated by the Food and Drug Administration. These products are not intended to diagnose, treat, cure or prevent any disease. If you are pregnant, nursing, taking medication, or have a medical condition, consult your physician before doing any of these health strategies.

*This information is based on Peer Reviewed published studies and all references can be found on DrJockers.com



Thriving Under Stress:

Everyone is under stress during the course of the day as they pursue their life endeavors. Some individuals allow the daily stresses to beat them down while others seem to thrive in the midst of their stress. The way you think, move and eat will play a significant role in your ability to thrive under stress.

Mental and emotional stress has the ability to elevate an individual's life or to de stroy it. The result depends upon the preparation, adaptation and recovery process the individual is able to go through with the particular stressor.

Let's face it, you and I will NEVER get rid of all of our unwanted stressors. We live in a society that i s demanding and we have to perform and produce on a consistent basis. Life isn't going to necessarily get easier, but WE CAN GET BETTER!

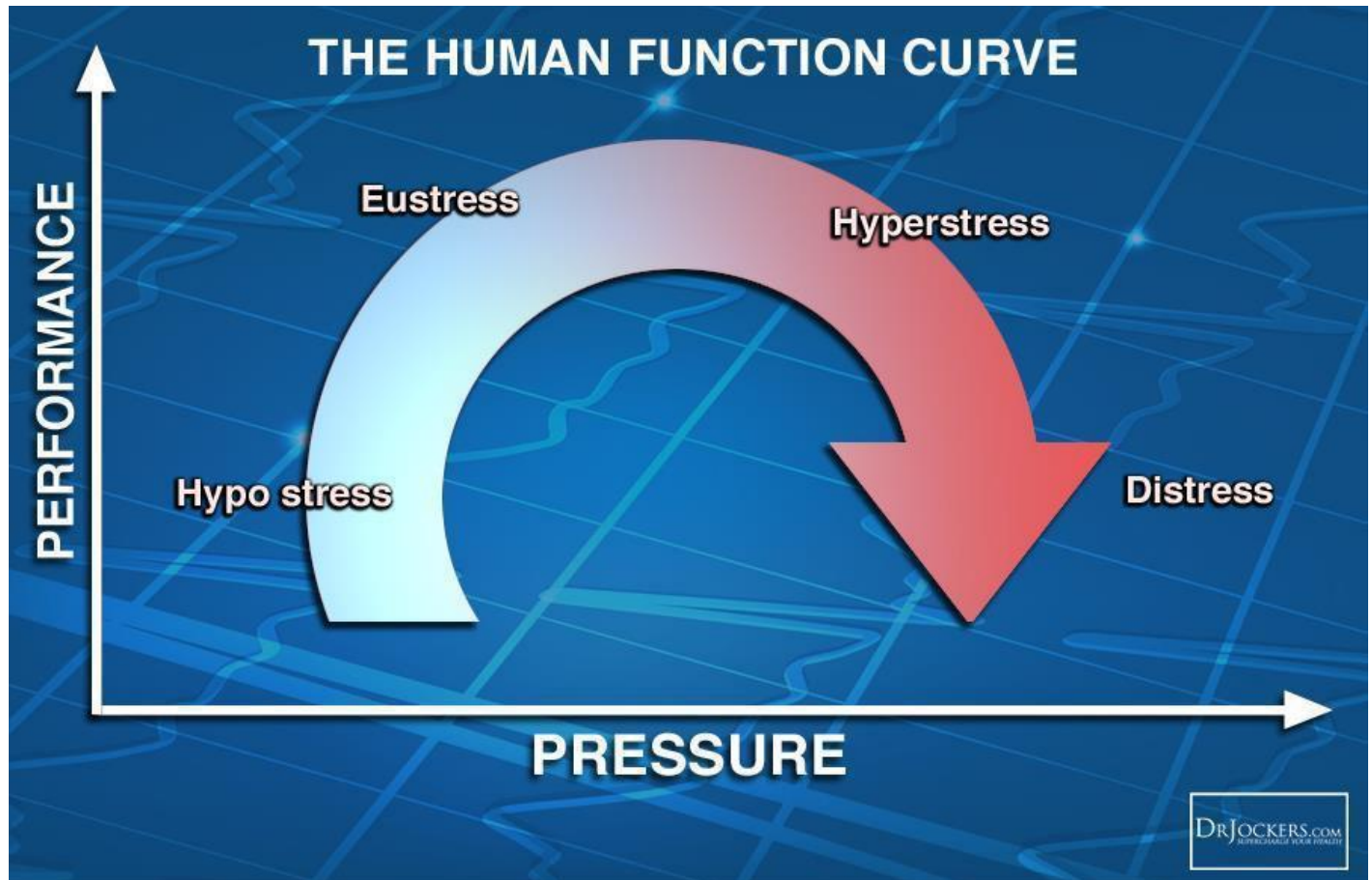
We can get better at developing our mindset, conditioning our emotions and training our body to handle stress, adapt, perform and recover effectively. My hope and prayer is that this booklet will help you do that!

Is Stress Really a Negative Thing?

Hans Selye developed the term "stress" and defined it as a "non-specific response of the body to any demand for change." Stress can be very positive for the body and that is called "Eu-Stress." An example of eustress would be high-intensity exercise where the body is aggressively challenged but later adapts and becomes stronger and more resilient through that stress ([1](#)).

Distress refers to either an enormous stress or chronic stress that the body is unable to effectively adapt too. Distress overwhelms the body and leads to unsuccessful adaptation and accelerated aging processes (2).

About 80% of our daily stressors can be used as eustressors that enhance our functionality. Here are the key steps and advanced strategies to adapt to stress more effectively and take your distress and turn it into eustress.



Changing Your Mindset:

Adapting well to stress begins with your mindset. Most people are focusing too much on their stress To and worry about all the uncertainties in their life. thrive under stress you must have confidence that you can overcome the hurdle.

Developing prayers and affirmative statements that instill hope can infuse you with new found energy that helps you think more creatively and innovatively about the unique challenge.

One advanced strategy to help you overcome the mental hurdles would be anchoring on previous successes. We have all had success at certain times in our life and if you can recall a great success you had that gave you a great emotional charge than you can anchor in empowering emotions.



The Power of Visualization:

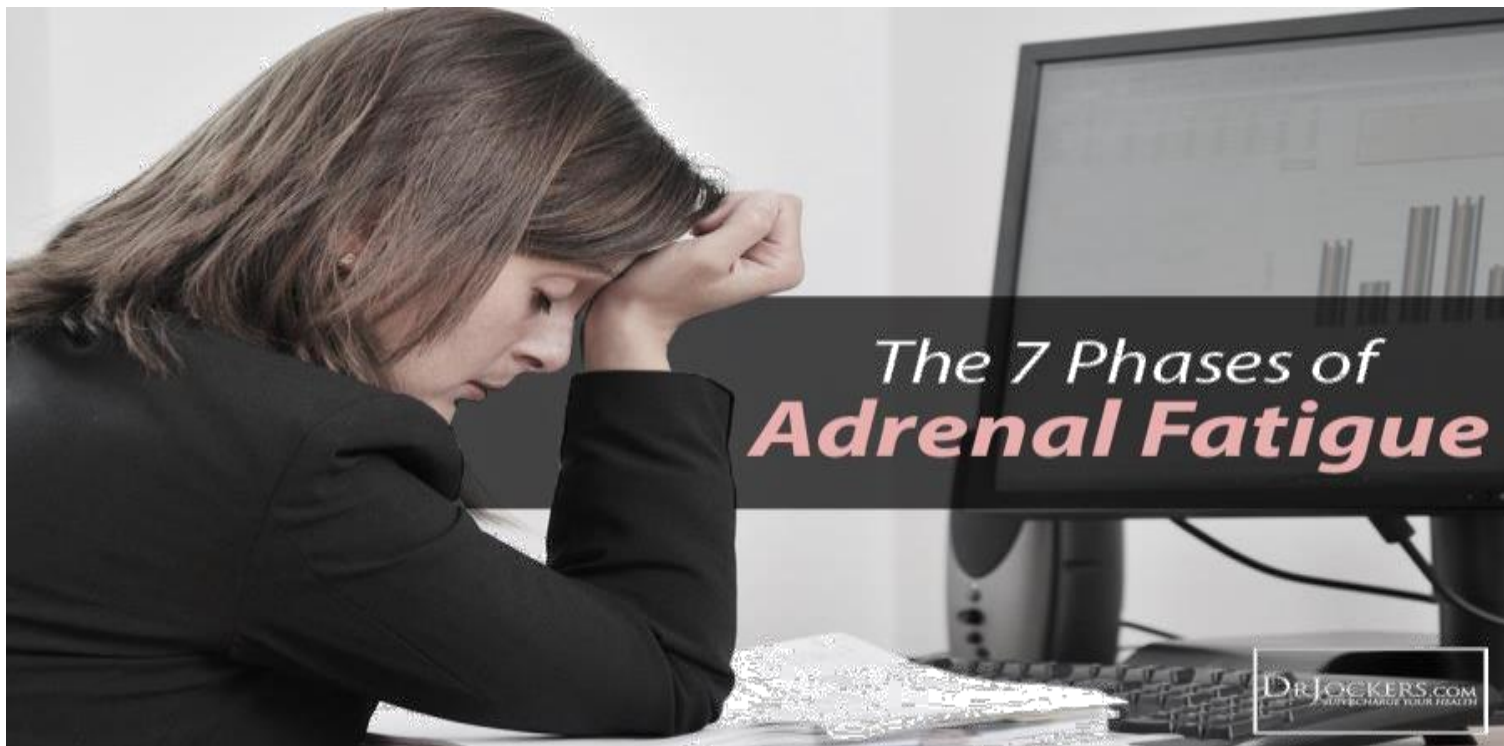
Simply take time to visualize and re-experience the success and the emotional charge and then anchor it into your physical body through a certain posturism or physical activity. An example would be to clench your fist or draw your shoulders back as you experience the emotional charge.

Repeat this visualization and activity again and again until you can recall the emotional charge immediately when you do the physical activity that is anchored to it. This gives you incredible mental/emotional leverage that you can use anytime you feel overburdened or stressed about a life circumstance.



This measurable state facilitates:

- Quicker reaction times
- Improved co-ordination
- Greater clarity of thought
- Improved decision making



The 7 Phases of Adrenal Fatigue

The adrenal glands help the body adapt to stress and reproduce through the unique compounds they produce and secrete. Over 50 essential hormones are produced within the adrenal glands. These hormones are critical to health and vitality. When we are overstressed, the adrenals pump out stress hormones until they fatigue and crash, which can be devastating to the body.

This can lead to a number of different symptoms with the most common being fatigue and inconsistent energy. Adrenal fatigue can be the primary trigger behind a health condition or it can be secondary to chronic infections, upper cervical stress, blood sugar dysregulation, etc.

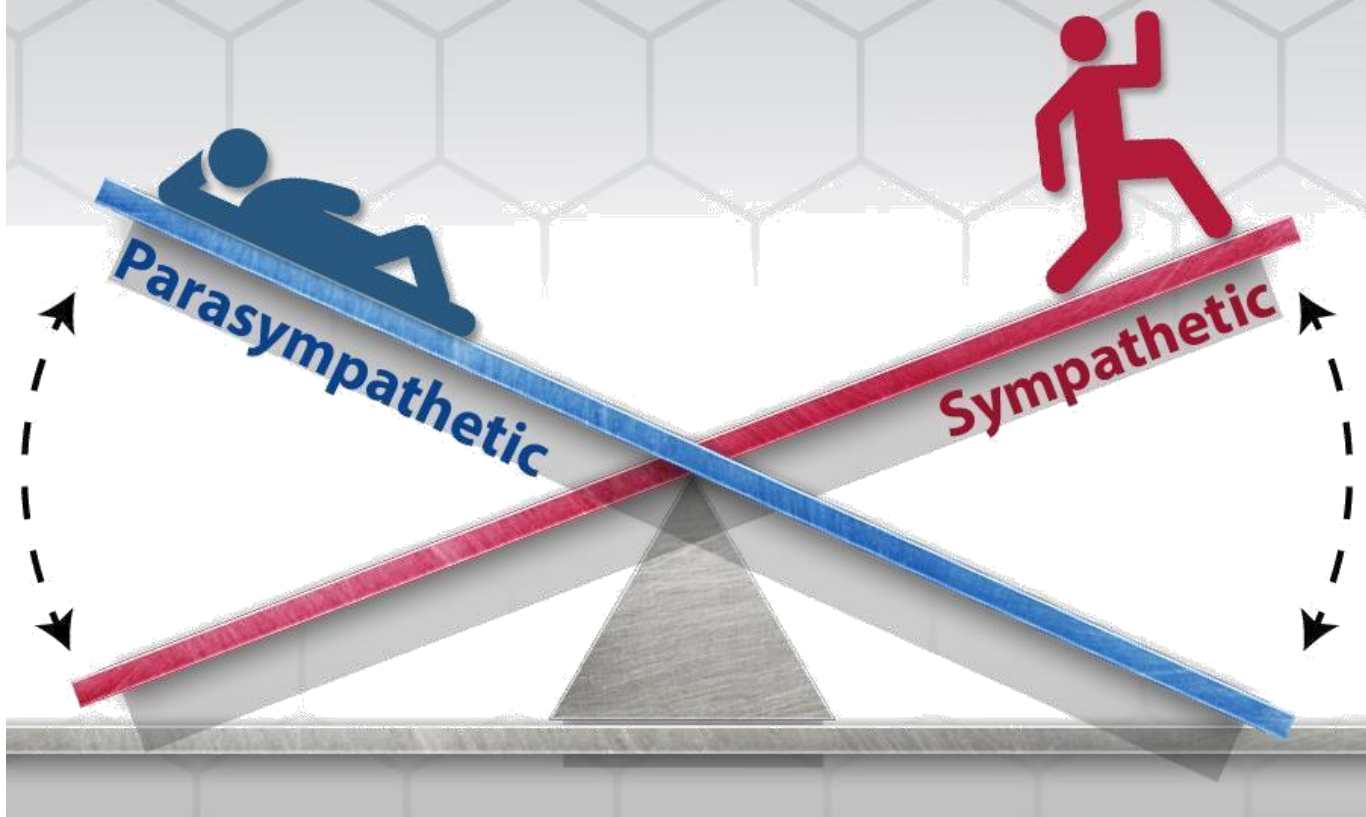
Sympathetic Vs Parasympathetic Tone:

When the body is under stress, it increases sympathetic tone, which is a part of our nervous system that wires us into a “fight or flight” mode. This is a normal and natural way our body protects itself. The problem is when this goes on for a long-period of time and creates a state of sympathetic dominance.

On the contrary, when we are able to relax, have fun, play, laugh, spend time deep breathing and in gratitude and prayer, we stimulate parasympathetic tone. This is the part of our nervous system that enhances healing and repair mechanisms.

We need good balance between both our sympathetic and parasympathetic systems. We want them both to be good at responding to the environmental demands. Most often, we want to be in a state of parasympathetic dominance so we can heal and repair effectively from the daily stressors ([2](#)).

Homeostasis is a dynamic balance between the autonomic branches.



Rest-and-digest:
Parasympathetic activity dominates.

Fight-or-flight:
Sympathetic activity dominates



The Epidemic of Adrenal Fatigue:

Adrenal fatigue is a condition that most everyone experiences at some point in their lives due to the amount of chronic mental, emotional, chemical and physical stressors that come with the life we live. These stimuli increase our state of sympathetic tone and increase the adrenal hormone output. Naturally, we should be able to cycle in and out as we take time to support our body, rest and repair.

The major problems with adrenal fatigue and its progression into adrenal exhaustion occur when the adrenals are unable to turn-off. This can be due to underlying infections, allergies, leaky gut syndrome, nutrient deficiencies and an overload of toxicities (3). Here is the list of major symptoms involved with adrenal fatigue.



Major Symptoms of Adrenal Fatigue:

Low Energy	Insomnia	Wired & Tired
Anxiety and/or Irritability	Auto-Immunity	Depression
Inability to Lose Weight	Inability to Gain Weight	Accelerated Aging
Sexual Dysfunction	Menstrual Irregularities	Chronic Pain
Digestive Problems	Menopausal Symptoms	Hypertension
Chronic Inflammation	Heart Disease	ADHD
Feeling Overwhelmed	Cravings for Sugar and Salt	Muscle Tension
Bone Loss	Lowered Immunity	Hypoglycemia

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The Major Function of the Adrenals:

These are all symptoms that are associated with a number of different disorders that are often overlooked by mainstream doctors. Some other major issues people will often experience include feeling really tired around 2-4pm, but getting another kick of energy in the evening and then having no sleep or poor quality sleep at night. These are often early signs that you are moving towards adrenal fatigue and the body is rewiring its physiological processes.

Although the adrenals are no bigger than the size of a walnut, they have an incredibly important role in the human life cycle. Some of the many different hormones created by the adrenals include steroid hormones such as adrenalin, norepinephrine, cortisol, aldosterone, estrogen and testosterone (1).

Adrenal Glands and Their Essential Bodily Functions



4 Categories of Hormones:

There are 2 major regions within the adrenal glands that produce hormones. This is the adrenal cortex and the adrenal medulla. The adrenal **cortex** is in the outer circumference of the adrenal glands, it produces three classes of hormones:

1. Mineralocorticoids:

This is primarily aldosterone which acts to maintain the proper salt and water levels to ensure the right blood pressure. Without aldosterone, the kidney will excrete most of the sodium and water, leading to severe dehydration, low blood pressure and possible death.

Individuals who struggle with high blood pressure often take medications that reduce the amount of circulating aldosterone in order to reduce sodium and water content in the blood. This results in a lowering of the blood pressure (2).

Individuals who struggle with too low of blood pressure, often have either an inability to produce and utilize aldosterone. This could be a genetic issue or a functional problem related to adrenal gland exhaustion.

2. Glucocorticoids:

This is mainly referring to cortisol which is involved in the stress response and its main function is to increase blood sugar and reduce inflammation. Cortisol stimulates glucose production within the liver and muscle cells, increasing blood sugar levels in order to prepare for a fight or flight response. In addition, it has significant anti-inflammatory effects.

High cortisol will cause increase blood sugar levels and can lead to weight gain (3). When the body is under chronic stress, we are unable to produce enough cortisol to keep up with the demands and therefore, we are unable to manage blood sugar and inflammation. The key is to have good cortisol balance in order to maintain proper blood sugar and inflammation levels.

3. Sex Hormones:

This includes the master precursor hormones DHEA and pregnenolone as well as estrogen, progesterone and testosterone. All have weak effects, but play a role in early development of the male sex organs in childhood, and in women during puberty. These are involved in creating and maintaining the differences between men and women.

The adrenal **medulla** is in the deep, inner region of the adrenal glands and it produces catecholamines. The medulla has a direct connection to the brain which is unique for an endocrine organ. When the body is under stress it fires directly to the medulla to raise up catecholamines. This allows the body to react very quickly to stress.

4. Catecholamines:

This includes adrenaline, noradrenaline and small amounts of dopamine. These hormones are the major players in the physiological characteristics of the stress response, the so called 'fight or flight' response. They act to drive up blood pressure, increase heart rate and respiration and increase mental awareness.

The fight or flight response is super critical for survival and for things like exercise and athletic performance. We also use this response in a positive manner when we do things like a business presentation. However, when this stress response is chronic, it wears down the bodies vital reserves and hampers the body's ability to heal itself (4).

4 Categories of Hormones



Mineralcorticoids: Maintain blood pressure

Glucocorticoids: Maintain blood sugar

Sex Hormones: Promote growth, repair and reproduction

Catecholamines: Adapt to stress

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The Major Adrenal Hormones:

Here is a review of what these key hormones do for the body:

Epinephrine: Also called adrenalin, made in the adrenal medulla, this helps to dilate blood vessels, increase heart rate, blood sugar and blood pressure so we can move and react quickly. This is necessary for emergencies and times when we are exercising or performing (such as giving a speech or performing in an athletic event).

Norepinephrine: This is a chemical made in the adrenal medulla that activates our sympathetic nervous system to help our body adapt to stress through fight or flight. It has very similar activity as epinephrine but is classified as a neurotransmitter in that it interacts with the brain and nervous system more than epinephrine which is classified as a stress hormone.

Cortisol: This is made in the adrenal cortex and is called a “glucocorticoid,” because of the cortex origin and how it functions to increase circulating glucose levels. Cortisol helps maintain blood sugar levels during times of stress. It also acts to reduce inflammation in the body.

Aldosterone: This is called a “mineralocorticoid” hormone because of its production in the adrenal cortex and its role in maintaining electrolyte balance to raise blood pressure. When secreted it acts on the kidney to reabsorb sodium, excrete potassium and increase fluid volume. Drugs are often used to lower aldosterone levels in individuals with hypertension.

Estrogen: This is the primary female sex hormone although males produce it as well. The three major naturally occurring forms of estrogen in women are estrone (E1), estradiol (E2), and estriol (E3). Another type of estrogen called estetrol (E4) is produced only during pregnancy.

Progesterone: This is one of the key female sex hormones that plays a role in maintaining pregnancy and fertility. Progesterone is produced primarily in the ovaries and the adrenal glands. It’s main responsibility is to prepare the body for conception and pregnancy, sexual desire and the regulation of the menstrual cycle.

Testosterone: This is a key sex hormone that is created in the testicles of males, the ovaries of females and the adrenal glands. It plays a key role in growth, mental drive, muscle development and fat metabolism as well as sexual desire.

Pregnenolone: This is the major precursor to all the major adrenal hormones as well as neuroactive steroids that help to improve brain function. Pregnenolone is produced from cholesterol and depending upon the environmental needs it will form into various amounts of progesterone, cortisol, aldosterone and DHEA.

DHEA: This is shortened for didehydroepiandrosterone, which is the most abundant circulating steroid hormone in humans. It is produced in the adrenal cortex, the gonads and the brain. DHEA functions predominantly as the metabolic intermediate in the formation of estrogen and testosterone.

Stress Hormones Before Sex Hormones:

The adrenal glands help to regulate the body’s ability to adapt to stress and they also produce hormones that regulate reproduction. The caveat is that adapting to stress overrides reproduction. Adapting to

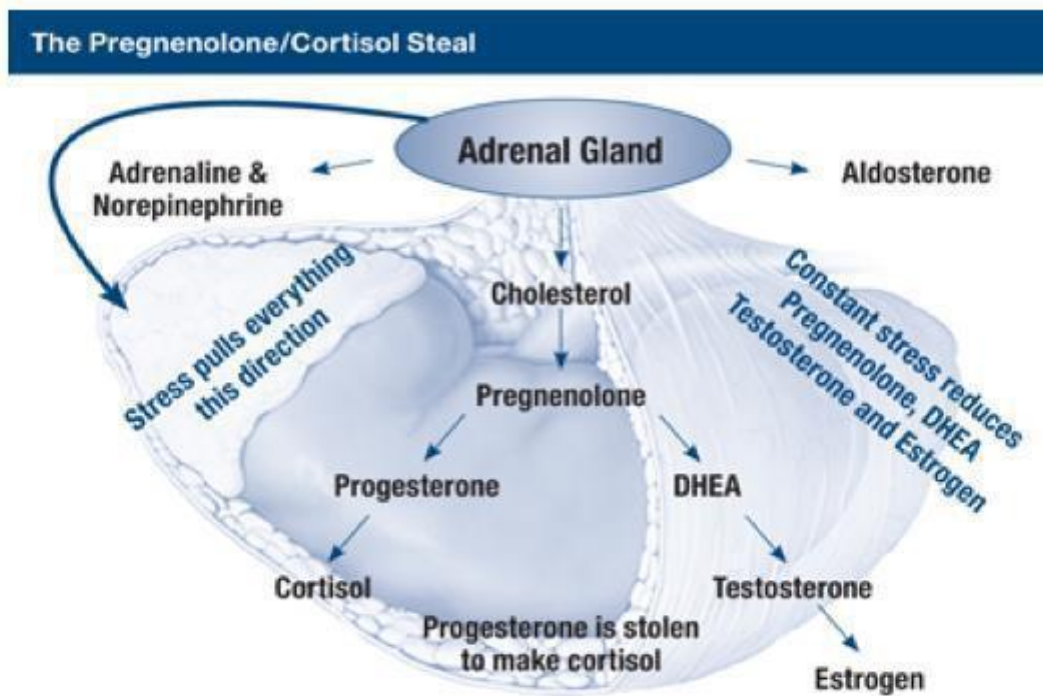
stress is critical for immediate survival and that is first priority. Once our physiology understands that we are not under an environmental threat, than it will focus its energy on reproductive hormone s.

The major stress hormones are cortisol, epinephrine and norepinephrine. These hormones help increase energy, increase blood sugar levels and speed up circulation and respiration to help the body survive through fight or flight.

The major sex hormones produced by the adrenals are estrogen, progesterone and testosterone. These are all critical for growth, metabolism, strength, endurance, mental drive, menstrual function and reproductive ability.

The master compound that is used by the body to produce cortisol and progesterone is called pregnenolone. Pregnenalone can either create cortisol, progesterone or DHEA. DHEA is used by the body to produce testosterone and estrogen. When the body is under chronic stress there is a high demand to produce cortisol which reduces the amount of progesterone and DHEA that is produced (5).

Pregnenolone Steal



What Stresses the Adrenal Glands?

The adrenal glands are meant to adapt the body to stressors. Our body was designed to grow stronger through daily stressors. We should have a natural stress, rest and adaptation cycle that allows the body to effectively acclimate to the environmental stimuli. However, when these stressors override our

ability to adapt effectively the body becomes weaker and chronic stress becomes hardwired into our system. This can lead to adrenal fatigue.

The adrenal glands are overstressed by a number of different chronic lifestyle factors such as:

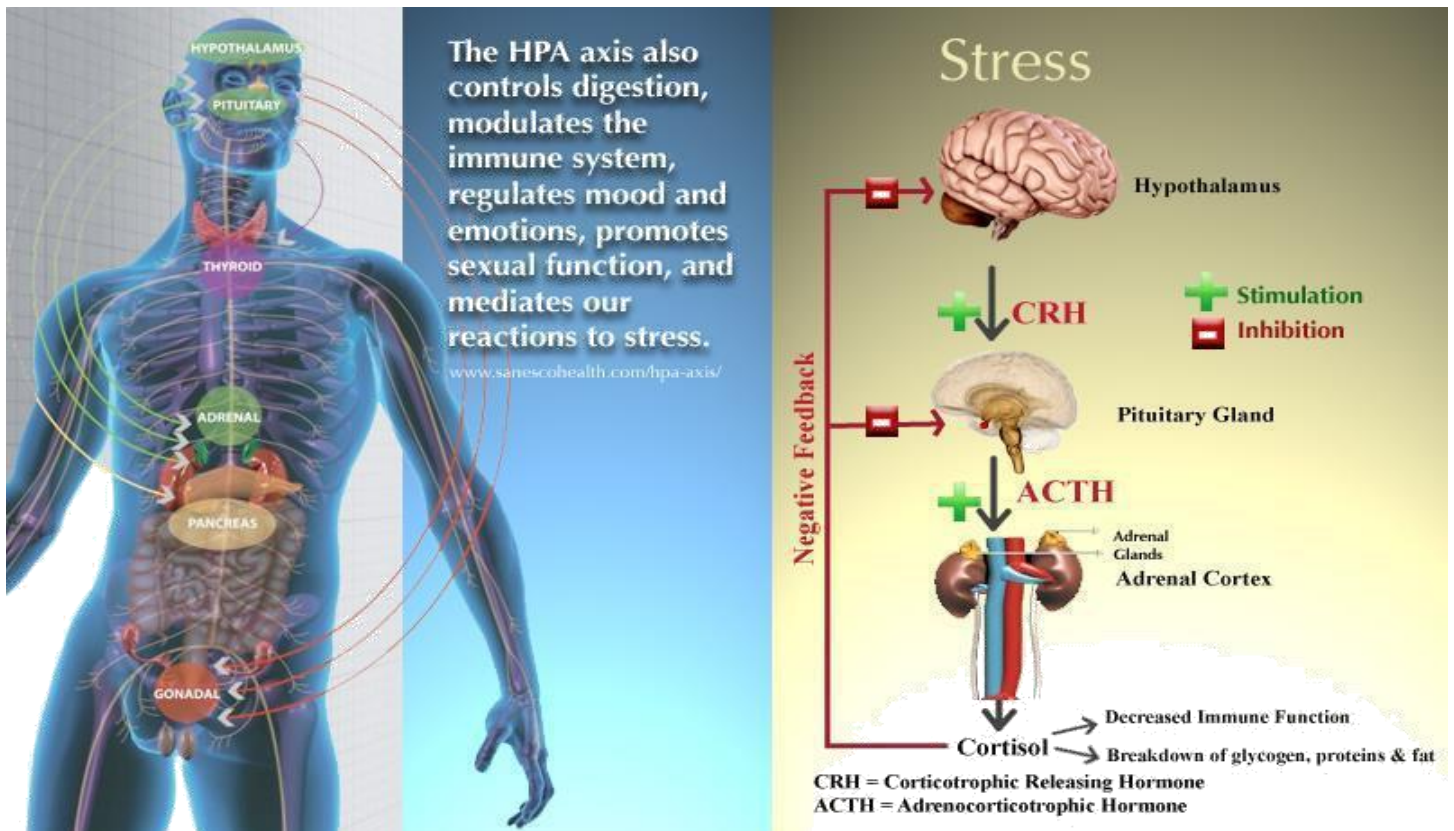


The HPA Axis and the Stress Response:

The body perceives and adapts to stressors through what is called the hypothalamic -pituitary-adrenal (HPA) axis. This area of the brain called hypothalamus senses the environmental conditions and then it sends signals in the form of chemicals to the pituitary gland.

The pituitary gland receives the signals from the hypothalamus (corticotropin releasing hormone – CRH) and sends its own chemical signals to the adrenal cortex through a hormone called adrenal cortico tropic hormone (ACTH) in order to form the appropriate responses to the environmental stimuli.

When we are under chronic stress it creates an alteration in the HPA axis which reduces the body's ability to adapt to new stressors. This condition is called adrenal fatigue, which can also progress further to adrenal exhaustion. This process of stress and poor adaptation can lead to a vicious cycle of chronic inflammation, tissue breakdown and accelerated aging (6).



The Phases of Adrenal Fatigue:

The first stage of adrenal activity is called the alarm reaction where the system becomes hyperactive to increase cortisol levels to adapt to the demands of stress. This is a healthy survival based response that everyone encounters throughout a typical day.

The second phase is the resistance stage where the body adapts to prolonged stress. During this phase the body steals pregnenolone from cholesterol to make more cortisol. This phenomenon is called pregnenolone steal.

Under normal circumstances the pregnenolone helps make sex hormones such as progesterone and testosterone. When pregnenolone steal takes place it leads to hormonal imbalances. Overtime this can cause very serious hormonal problems such as PMS, infertility, male menopause and polycystic ovary syndrome.

The third and final phase of adrenal fatigue is the exhaustion phase. This is when the adrenals are so exhausted they are unable to adapt to stress. All the necessary cofactors to produce cortisol are depleted and so cortisol levels drop.

The pregnenolone steal effect stops at this point but the body is unable to produce adequate energy and fatigue, accelerated aging and breakdown of the body's protective barriers (skin, blood brain barrier and gut barrier) are the hallmarks of this particular physiological state.

The Adrenal Salivary Index:

The adrenal salivary index is a test that measures the spectrum of adrenal health. This requires four saliva samples taken throughout the day. This measures the level of cortisol and DHEA throughout the day. In addition, I like to see estrogen, progesterone and testosterone levels, which helps us shape out what is happening with the overall adrenal function.

A healthy circadian rhythm will have an elevated cortisol level in the morning and low cortisol at night. When people have insomnia they often have elevated cortisol at night and then low cortisol in the morning leaving them groggy in the AM. Others have cortisol dysregulation that demonstrates itself with ups and downs throughout the day rather than a steady decline from morning to nightfall.

The measurements of this test allow us to understand the stage of adrenal dysfunction. This test places people into a normal, stage I-III or failure levels. Stage I is the alarm reaction, stage II is the resistance as the body tries to keep up with the demands and phase III is the adrenal exhaustion stage. Finally, the adrenal output fails.

Functional medicine experts such as Dr Datis Kharrazian and Dr Michael Lam have created an even more detailed way of understanding the level of adrenal fatigue with a 7 phase model that focuses on all the unique reflection points that can be analyzed on the salivary adrenal test.

Here is how this works and be sure to check out the image on page 16 to see this in action:

Phase 1: Initial Alarm Reaction:

This has elevated cortisol and DHEA. This is the normal acute response to stress and is often seen in hardworking individuals and athletes who are overtraining.

Phase 2: Deep Alarm Reaction:

At this point the cortisol remains high but the DHEA drops down to normal. This indicates a progressive state of the alarm reaction and the body is no longer under acute stress. The reason that DHEA drops is that it is being used to make cortisol. This is where we begin to notice symptoms.

Phase 3A: Resistance Stage:

This stage is marked by high cortisol and low DHEA as pregnenolone steal is in place. With low DHEA, it sets the stage for major hormonal imbalances in the body. This stage is typically marked by insulin resistance.

Phase 3B: Deep Resistance Stage:

In this stage cortisol is low and DHEA is low. This indicates the progression of resistance into exhaustion stage. Now the adrenals are so overworked they are losing the ability to have any control over stress.

Phase 3C: Non-Adapted Adrenal Exhaustion:

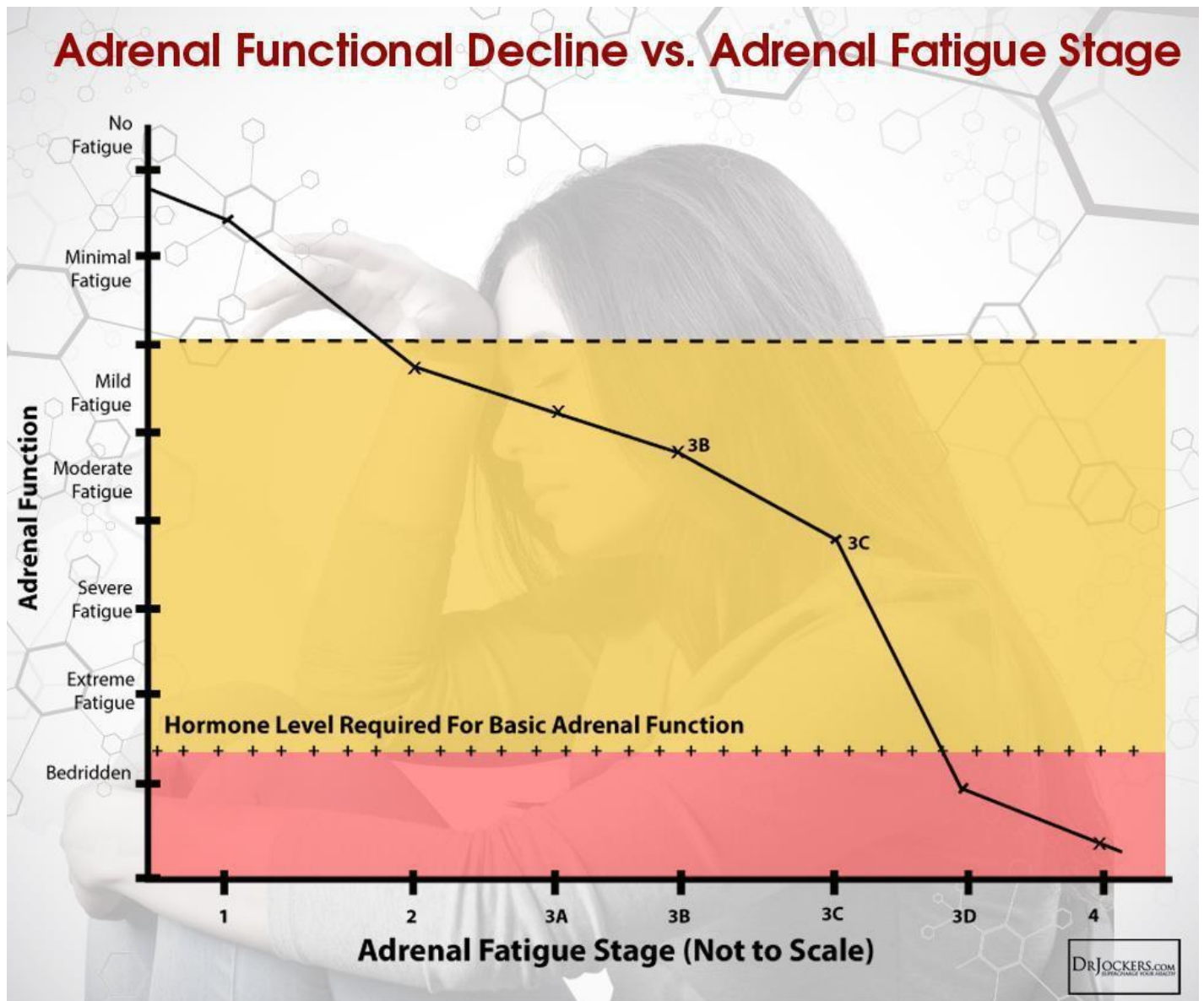
At this stage cortisol is low and DHEA is normal. This is where pregnenolone steal has failed to shift all the resources into cortisol production. There is still some level of DHEA but cortisol levels are failing. This phenomenon could be due to insulin resistance which should be evaluated.

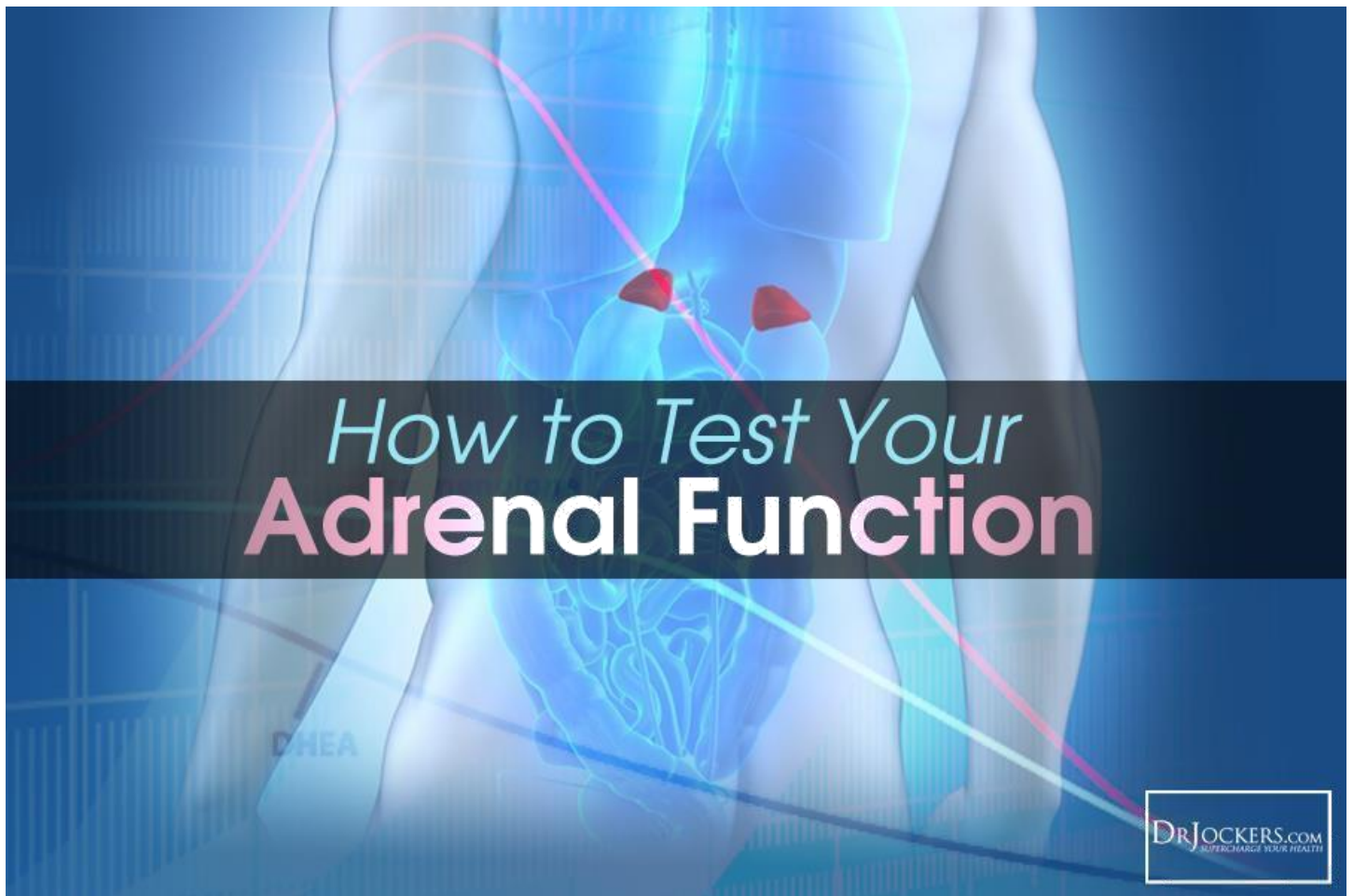
Phase 3D: Inappropriate DHEA:

This is where Cortisol is low but DHEA is high. The individual may be supplementing with DHEA or they may have Polycystic ovary syndrome (PCOS). Insulin resistance may also be in play here.

Phase 4: Adrenal Fatigue in Full Exhaustion:

Cortisol and DHEA are both very low. In this state the adrenals have completely lost the ability to control cortisol and adapt to stress. Frequent blood sugar imbalances and crashes are common in this state.





How to Test Your Adrenal Function

The adrenal glands function to help us adapt to stress and heal. When the adrenals are out of balance, it affects our energy, sleep, mental focus and hormone balance. Overtime, we can develop a condition called adrenal fatigue in which our adrenal glands are unable to keep up with the demands of the environment.

The adrenals are coordinated by regions of the brain called the hypothalamus and the pituitary gland. The hypothalamus has an antenna like effect in which it is constantly checking the blood stream for any signs of stress. When it notices changes (such as breathing changes) it sends signals to the pituitary gland and the sympathetic nervous system which then activate the adrenals. As discussed in chapter 2, this connection process is called the hypothalamic-pituitary-adrenal (HPA) axis.

When the body is under chronic stress it creates a communication breakdown in the HPA axis leading to both adrenal overactivity and underactivity ([1](#), [2](#)).

Overactive Vs Underactive Adrenals:

Depending upon the individual and how they uniquely handle chronic stress and how long the individual has dealt with stress, they will experience adrenal fatigue in different ways. We put these in 2 major categories:

Adrenal Hyperfunction: Overactivity of adrenal output

Adrenal Hypofunction: Underactivity of adrenal output

When the adrenals are overactive, they produce too much cortisol, epinephrine, norepinephrine and often times aldosterone. Cortisol plays a role in elevated blood sugar, so individuals with adrenal hyperfunction will often have increased blood sugar levels. This may eventually lead to insulin resistance and diabetes(3).

In the case of underactive adrenals, they produce too little cortisol to maintain normal bodily homeostasis (4). This often results in hypoglycemic reactions and increased inflammation as cortisol is unable to control blood sugar and the inflammatory response.

When cortisol levels drop, the adrenals will release epinephrine which causes a stronger stress response than cortisol. The release of high amounts of epinephrine can cause lightheadedness, dizziness, heart palpitations and irritability. This is what people with hypoglycemia experience . This often happens at night and causes the individual to wake up in the middle of the night and not be able to fall back asleep.

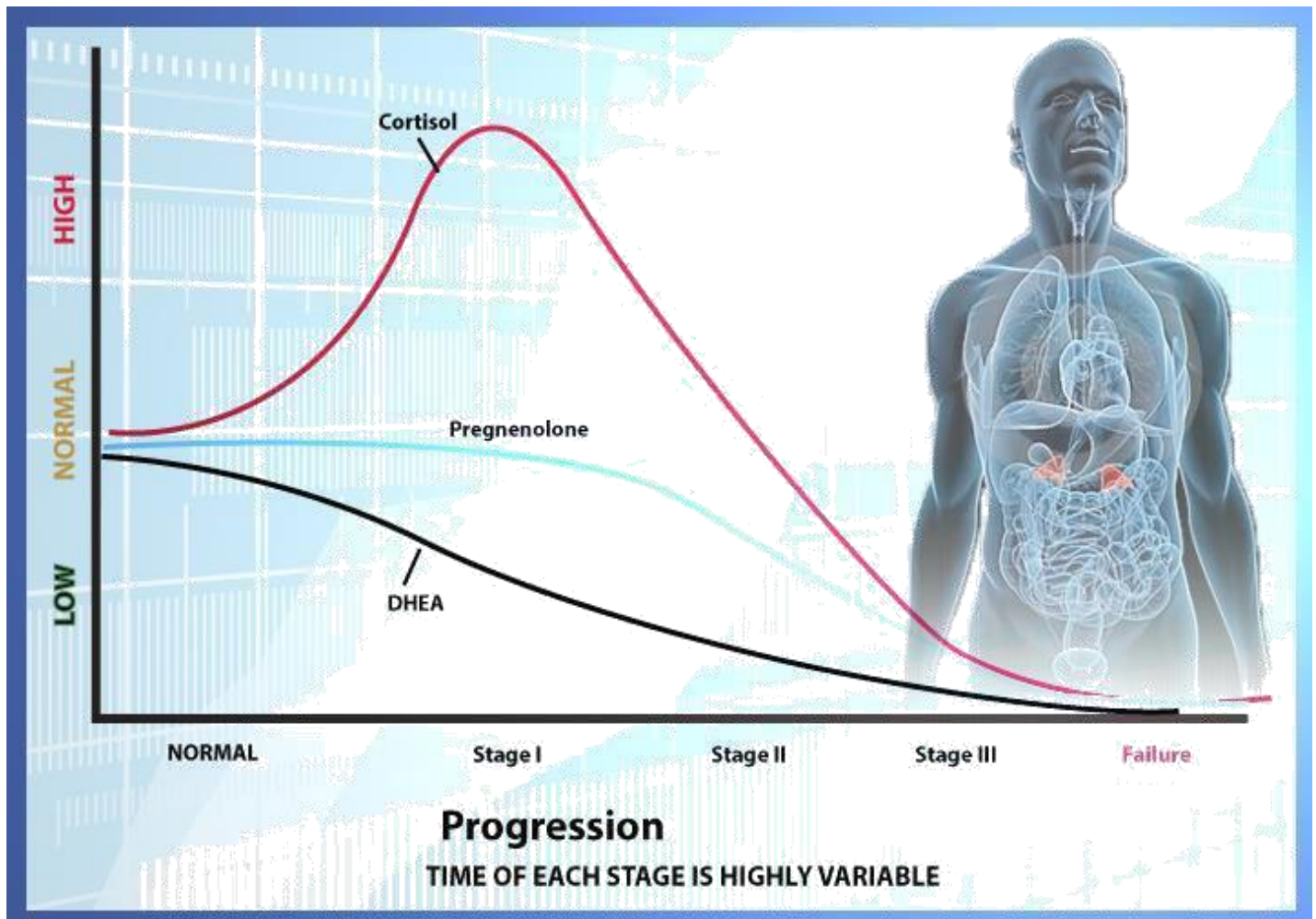
Testing the Adrenals:

The gold standard test is called an adrenal salivary index that charts out the levels of cortisol and DHEA throughout the day. This test looks at four saliva samples taken throughout the day and measures the cortisol slope throughout the day. Cortisol should naturally be high in the morning and slowly go down to its lowest levels at night.

Many individuals with adrenal fatigue have disproportionate cortisol slopes with elevated cortisol in the evening. This can cause poor sleep and anxiety at night. When I look at the adrenals, I also like to see estrogen, progesterone and testosterone levels, which help us shape out what is happening with the overall adrenal function.

The challenge with the salivary cortisol test is that it costs around \$300+ depending upon the provider and lab and is rarely ever covered by insurance. Additionally, most mainstream medical doctors have never been trained in the analysis of this test.

They usually just run a standard blood cortisol test that only looks at cortisol at one time during the day. The key is to look at the cortisol rhythm and not just one period of time, which can be all over the place depending upon the time of day.



At Home Tests For Adrenal Fatigue:

There are many different clinical signs for adrenal fatigue that can be found through both at home and standard laboratory testing. Here are a few tests you can do at home to get a self-analysis of the health of your HPA axis.

1. Blood Pressure:

The adrenals play a big role in helping to maintain normal blood pressure levels. A normal resting blood pressure should be in the range of 110-130 mm/Hg systolic over 70-80 mm/Hg. Diastolic. Individuals with adrenal hyperfunction (high stress hormones) will have high blood pressure while individuals with adrenal hypofunction (low stress hormones) will have low blood pressure.

A resting blood pressure over 130/80 mm/Hg can be a sign of high adrenal output. A resting blood pressure under 110/70 mm/Hg may be a sign of low adrenal output.

2. Orthostatic Hypotension Test:

All you need for this one is a blood pressure cuff. Lie down for 5 minutes and then take your blood pressure and make note of it (especially the systolic – top number). Then stand up and take your blood pressure again immediately.

The systolic pressure should naturally rise about 10 mm/hg when you go from sitting to standing. If the systolic pressure remained the same or it decreased, there is a chance you have adrenal fatigue. When we stand, epinephrine is normally secreted to increase the blood pressure to overcome gravity and pump blood towards the heart.

3. Pupillary Constriction Test:

This test was first described in 1924 by Dr. Arroyo. It measures the contraction of the iris in response to dark light exposure. The hypothalamic-pituitary-adrenal (HPA) axis helps to control the contraction of the iris.

When someone is dealing with adrenal fatigue, they are unable to maintain the contraction for a normal length of time. Here is how you do the test.

1. **Set up the Room:** Sit in front of a mirror in a dimly lit room.
2. **Use a Flashlight:** Take a flashlight and shine it into your eye from the side of your face (45 degree angle). When this happens, your eyes will naturally constrict and the diameter will reduce in size. Here are the possible results:

Pupillary Response:

Stays constricted for 20+ seconds

Fasciculates between 10-20 seconds

Fasciculates between 5-10 seconds

Immediate pulsation and dilation

Possible Finding:

Healthy HPA Axis

Mild HPA Axis disruption

HPA Axis Fatigue

HPA Axis Exhaustion/Failure

At Home Adrenal Tests

- 1 Blood Pressure
- 2 Orthostatic Blood Pressure
- 3 Pupillary Constriction Test



Blood Tests For Adrenal Function:

Standard and inexpensive blood work can provide a lot of important information regarding one's health if it is interpreted correctly. A functional blood chemistry evaluation takes into account a number of individualized factors that help to give an understanding of the individual's health in regards to the complex connections between the various systems of the body.

Simple and inexpensive tests such as a complete blood count and comprehensive metabolic panel can identify dysfunctions in the kidneys, liver, gut and adrenals. Insurance companies will pay for these tests at your primary care provider.

I personally have these tests available within my Total Thyroid package that also looks at Vitamin D, C reactive protein, homocysteine, full thyroid panel including antibodies and much more. This is the most common lab I recommend. You can check that out [here](#)

The Total Thyroid Report



Adrenal Hyperfunction:

This condition is characterized by an excess of cortisol and stress hormones. In addition, this will result in high aldosterone levels, which causes sodium chloride retention and potassium dumping.

High aldosterone levels will cause hypertension and can also contribute to symptoms such as anxiety, irritability and headaches.

On a comprehensive metabolic panel, you will see a level for sodium, chloride and potassium. This is key to understanding what is happening with the adrenals.

Sodium:

Sodium should normally be between 140-145 mmol/L. With adrenal hyperfunction, sodium will be in the high normal or above. So anything 144+, I start to consider adrenal hyperfunction.

Potassium:

This should normally be between 4.0-4.5 mmol/L. When it is low, 4.0 or under, it is a strong consideration for adrenal hyperfunction.

Chloride:

This is a component of sodium – sodium chloride and is retained in adrenal hyperfunction. Normal levels should be between 100-106 mmol/L. When chloride levels are over 105 mmol/L, it is a sign of adrenal hyperfunction.

The end result of this is metabolic acidosis and is often seen with hypertension and anxiety.

Carbon Dioxide:

The levels are usually low – under 25, which is a sign of blood sugar dysregulation

High Blood Glucose:

Most people with adrenal hyperfunction have elevated fasting blood glucose and HgA1C because these individuals have high cortisol (which elevated blood sugar) and high stress hormones (or low) leads to insulin resistance and poor blood sugar control.

High Cholesterol:

Individuals with adrenal hyperfunction will often have high cholesterol and the terrible triad of high LDL, low HDL and high triglycerides.

Adrenal Hyperfunction *Blood work shows:*

- ✓ High Sodium
- ✓ Low Potassium
- ✓ High Blood sugar
- ✓ Low Chloride



Adrenal Hypofunction:

This condition is a sign of low cortisol, stress hormones and aldosterone levels. This will lead to lower sodium and chloride levels and higher potassium levels. It will also result in low blood pressure, dizziness, fatigue and hypothyroid type of problems.

Sodium:

Because aldosterone is low, the body will not retain sodium. You will see that the levels will be 140 or less.

Potassium:

Aldosterone helps to keep sodium/potassium balance so with low sodium, there will typically be high potassium. The levels will be higher at 4.4 or above

Chloride:

Aldosterone works to maintain chloride levels and so they will be low. The levels would be under 101.

When there is high potassium and low sodium, it causes a state of metabolic alkalosis. This can be just as problematic as metabolic acidosis and is just as common as acidosis, if not more.

Classic signs that are usually seen together include low blood pressure, hypothyroid and metabolic alkalosis.

Carbon Dioxide:

This is usually low – under 25, due to the poor blood sugar regulation

Low Blood Sugar:

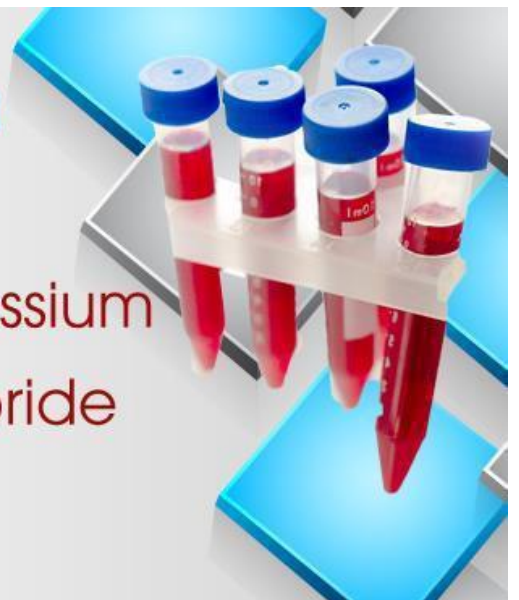
Because the individual has low cortisol levels they will typically show a low fasting blood glucose level (under 80 mg/dl) but normal to high HgA1C because they also deal with insulin resistance due to poor blood sugar control.

Low Cholesterol:

Individuals with adrenal hypofunction may have low total cholesterol and very high HDL in proportion to LDL.

Adrenal Hypofunction *Blood work shows:*

- ✓ Low Sodium
- ✓ High Potassium
- ✓ Low Blood sugar
- ✓ High Chloride



The Adrenals and Your Electrolyte Balance:

We all have mineral salts in the form of sodium, potassium chloride, magnesium, calcium and phosphate that help to control the electrical charge and water flow around cells.

The most important ratio for fluid and electrolyte dynamics is the sodium:potassium ratio. This plays a role in blood pressure, nervous system activity, energy utilization and more. When the body has excess adrenal activity, there will be too much sodium and low potassium and low adrenal activity will lead to low sodium and high potassium.

Using minerals can be very important for balancing adrenal function. Many people are chronically dehydrated despite drinking a lot of water because they have mineral imbalances. We know that soil depletion has removed a significant amount of minerals such as magnesium from our food then in years past.

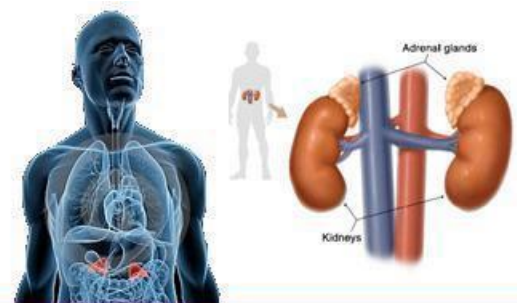
The minerals in typical table salts are poorly absorbed and most people are eating very little mineral rich foods throughout the day. In addition, many people have low stomach acid and other digestive disturbances that lead to poor mineral absorption.

Most people with adrenal hypofunction will have low sodium and chloride levels and will crave salts in order to help balance this. Make sure they are consuming mineral rich foods and good quality sea salts and Himalayan sea salt in particular.

Summary:

There are many ways you can study the health of your adrenals. You can try the 3 at home tests to determine the status of your HPA axis, you can also look at very inexpensive and standard lab work for signs. Finally, you can purchase and a salivary adrenal cortisol test to look at your cortisol and DHEA levels throughout the day.

Healthy Adrenal
Rhythm Test





When the body is not functioning at a high level it causes more energy output from the adrenals. Overtime, this can lead to adrenal exhaustion, when the adrenals are no longer able to meet the demands of the environment.

Adrenal exhaustion is a very serious condition that causes accelerated aging, chronic inflammation, overwhelming fatigue and an inability to heal and repair. The individual wants to sleep and feels the need to sleep but most commonly has trouble falling and staying asleep.

Nutrition and Adrenal Fatigue:

Our nutrition plays a large role in the development and the healing of adrenal fatigue. Most people in our society are consuming far too many carbohydrates and not enough pure nutrients and good fats. This causes blood sugar imbalances. The adrenals must work extremely hard to maintain blood sugar stability and the modern diet taxes them to the limits.

The best diet for adrenal fatigue begins by working on stabilizing blood sugar with the use of good fats. This includes using coconut oil, coconut butter, coconut flakes, coconut milk, avocados, olives and olive oil and grass-fed butter or ghee and pasture-raised animal products.

These fat sources should be the staple of the diet. The cholesterol within things like grass -fed butter or ghee and quality animal products is also needed for the production of the adrenal hormone precursors

pregnenolone and DHEA. Additionally, the fats help to keep blood sugar stable and take stress off the adrenal glands.

Adding in lots of phytonutrients and trace minerals in the form of non-starchy vegetables such as dark green leafies, cucumbers, celery, radishes, cruciferous veggies, etc is very important. Be sure to get a lot of herbs into your diet including ginger, turmeric, rosemary, thyme, basil and oregano.

Using low-glycemic fruit such as berries, lemons, limes and granny smith apples is ideal. These are low in sugar and loaded with anti-oxidant compounds that help reduce stress on your body.

Having clean protein at each meal in the form of organic, pasture -raised poultry, beef and wild game is extremely key. Protein and amino acids are necessary for the production of stress hormones, good blood sugar balance and anti-inflammatory enzyme production. Here is the food guide pyramid to follow for healthy adrenal function.



25 Strategies to Heal Adrenal Fatigue:

Here are the top strategies for healing adrenal fatigue naturally. You should always consult with your physician before stopping or changing medications or taking on new health strategies.

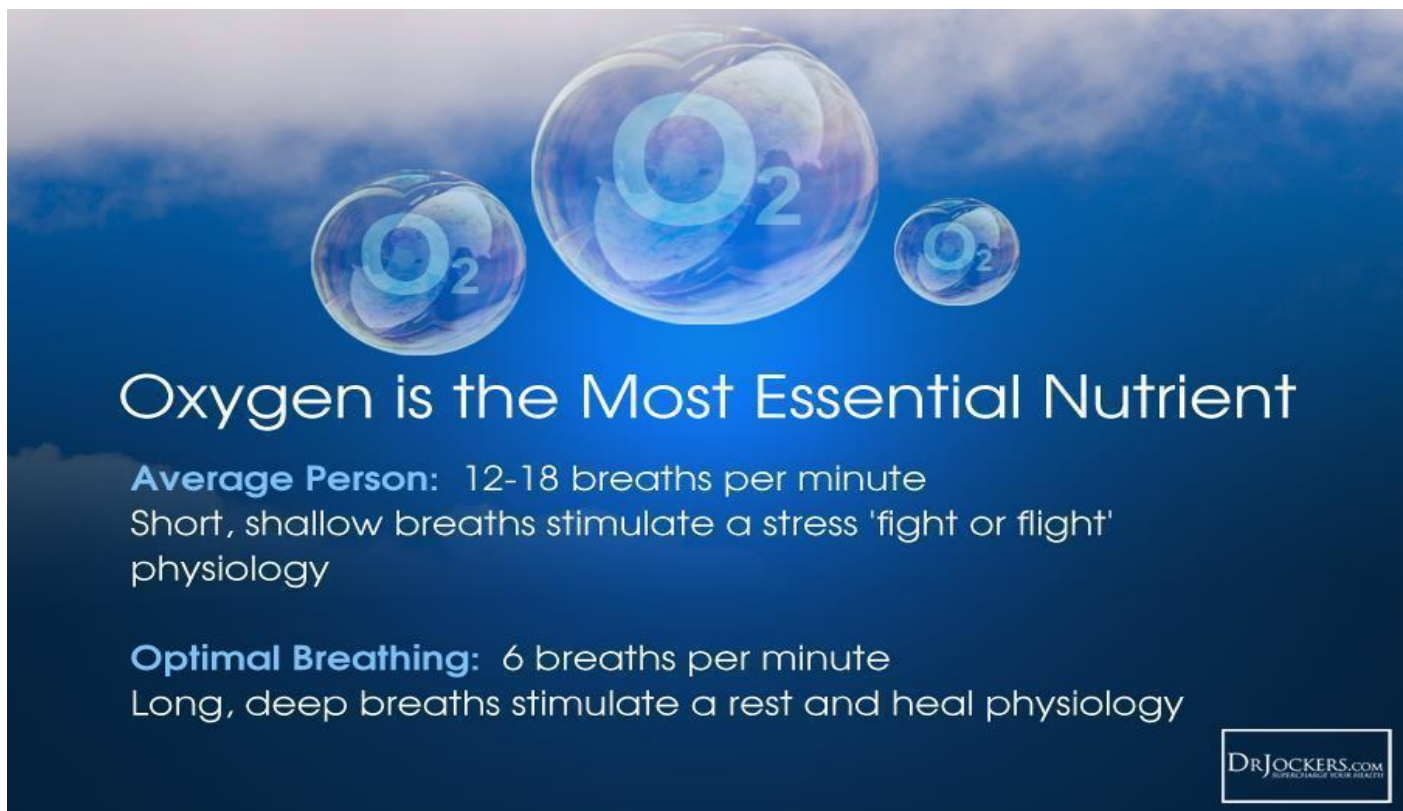
Additionally, you should be working with a functional health practitioner to help guide you through these strategies. This is not an exhaustive list and there are other natural therapeutic strategies that I and functional health practitioners will utilize to help individuals with adrenal fatigue.

1. Anti-Inflammatory Diet:

It is important to build your diet around good fats, anti-oxidant phytonutrients, clean protein, healthy fibers, fermented foods and natural sweeteners in moderation. If you suspect food sensitivities, than following an elimination diet is highly recommended.

2. Focus on Deep Breathing:

Improving your posture, seeing a high quality chiropractor and optimizing your breathing patterns is highly recommended. Take time every day to breath long and deep and allow the rest and peace that comes with this practice to come over you.



Oxygen is the Most Essential Nutrient

Average Person: 12-18 breaths per minute
Short, shallow breaths stimulate a stress 'fight or flight' physiology

Optimal Breathing: 6 breaths per minute
Long, deep breaths stimulate a rest and heal physiology

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3. Zinc, B Vitamins and Magnesium:

Be sure to optimize your zinc and magnesium levels. Both of these nutrients work to improve blood sugar signaling problems. Pumpkin seeds are one of the richest sources of both zinc and magnesium.

Additionally, make green drinks or use super green powders and consume healthy organic meat products. This combination of foods provides a lot of bioactive B vitamins, magnesium and zinc.

4. Dry Brush Your Skin:

The Ayurvedic practice of dry brushing boost circulation and therefore also boost lymph flow and detoxification. In addition, it helps to stimulate endorphins and other feel good neuropeptides. It helps to reduce the stress response and is very relaxing and rejuvenating for the body.

5. Hydrate Your Body Well:

Water is extremely critical for balancing stress hormone production. When you are dehydrated, you will naturally stimulate stress hormone production. Drinking 8oz of water can be one of the best ways to tone down the stress response and put you back into a state of rest and repair.

On a daily basis, I recommend starting your day with 16-32 oz of water first thing in the morning and consuming a minimum of 8oz of water every 2-3 hours throughout the day. Your goal should be a minimum of half your body weight in ounces of water each day.

It is also great to add in fresh squeezed lemon or lime, essential oils or apple cider vinegar to add more anti-oxidants and enzymes.

6. Ground Your Body:

In our society we are surrounded by toxic electromagnetic frequency's (EMF's). These EMF's increase stress within our body and alter neurotransmitter function.

By going outside daily and walking barefoot on grass, dirt or sand you absorb natural EMF's from the ground that balance your electrical rhythms.

"Physical disconnect with the Earth creates abnormal physiology and contributes to inflammation, pain, fatigue, stress, and poor sleep. By reconnecting to the Earth, symptoms are rapidly relieved and even eliminated and recovery from surgery, injury, and athletic overexertion is accelerated."

—From *Earthing*, by Martin Zucker

7. Avoid Caffeine & Sugar:

Caffeine works by stimulating the adrenals to pump out more stress hormone. If the body is already in a state of adrenal fatigue, than this will overtax the body and cause adrenal exhaustion and burnout.

Increasing sugar creates blood sugar imbalances, which cause the adrenals to have to work harder in an effort to maintain some level of balance of sugar in the bloodstream. Staying off of sugar is a priority to heal fatigued adrenals.

8. Use Essential Oils:

Essential oils are the life blood of the plant. Some essential oils that work great for adrenal fatigue include lavender, vanilla, rose, lemon balm, chamomile, rosemary and frankincense.

You can diffuse these in your home and/or apply them with a carrier oil of coconut oil and apply them to your skin. These are all rather mild so you can also put 2 drops in a glass of water and consume as well.

I recommend using rosemary, lemon balm, vanilla, rose and frankincense during the day and lavender and chamomile at night to help improve relation and sleep.



9. Improve Your Sleep:

Sleeping a high quality 8-9 hours each night is key to healing and improving your ability to adapt to stress. I also recommend taking a daytime nap sometime between 12 – 3pm in order to reduce stress hormones and allow for a short reset before going into your afternoon activities. Follow the steps in this article to improve your sleep.

10. Low Intensity Movement:

A sedentary lifestyle creates more stress on the body. Light movement is anti-inflammatory and healing for the adrenals. Throughout the day, get a lot of low-intensity movement such as walking, light cycling, playing, etc. Regular movement will help reduce inflammation in the body and boost your mood.

11. See a Wellness Chiropractor:

Stress on the upper cervical spine can cause an increase in sympathetic tone and stress hormone production. If this problem is not corrected, over time, it can lead to poor tissue healing and adrenal fatigue (4).

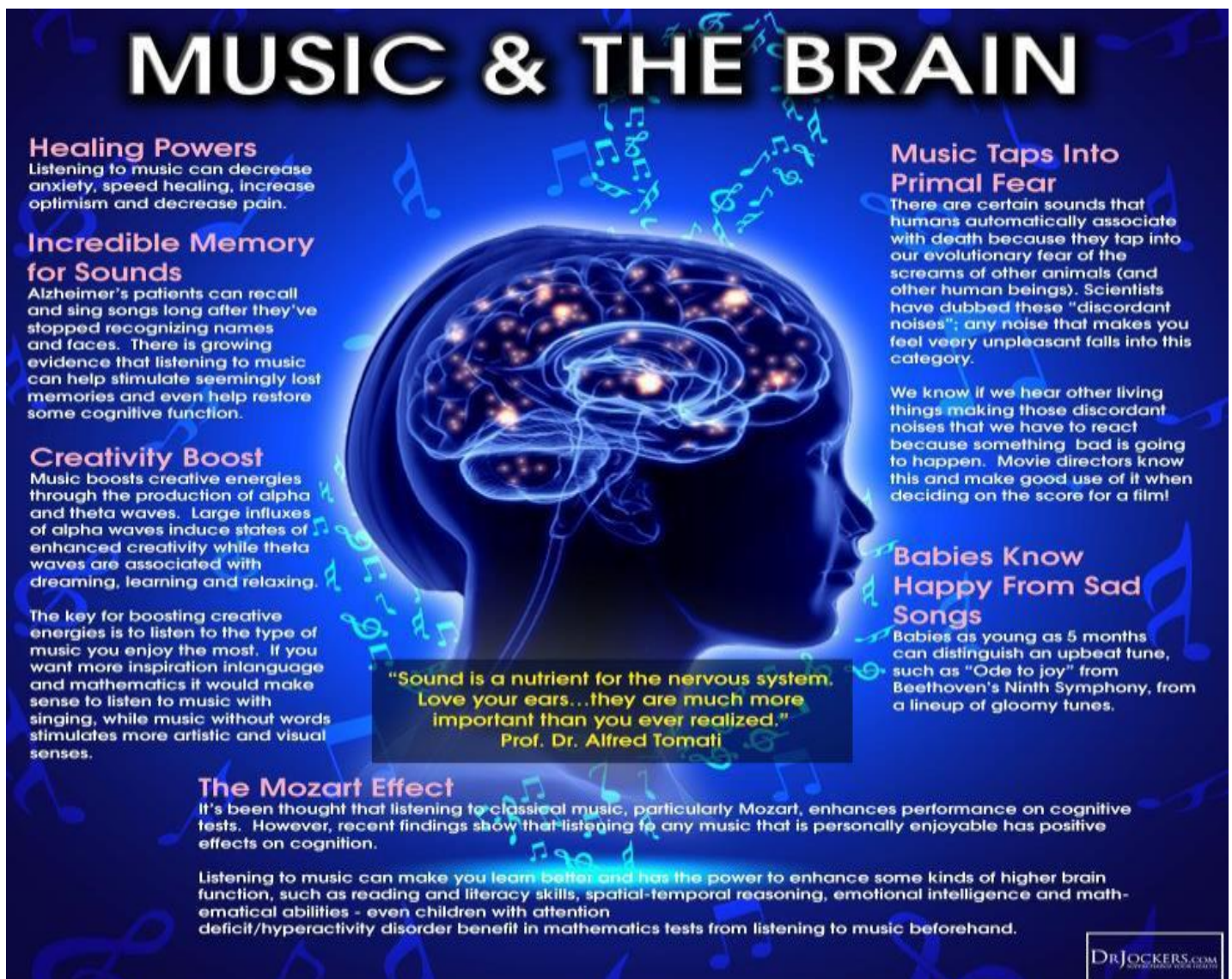
Seeing a wellness based chiropractor who can accurately assess for upper cervical subluxations and give specific corrective adjustments and exercises to stabilize this region can be extremely helpful in reducing stress on the body (5).

Other subluxation problems that need to be addressed include forward head posture and loss of cervical curve which both put a lot of pressure on the nervous system and lead to an increase in sympathetic tone.

12. Listen to Light Inspirational Music:

Listening to light classical, meditation or worship music can be extremely healing for the body. These forms of music are not overstimulating, but they have unique harmonies that boost up endorphins and stimulate the formation of serotonin.

In addition, listening to classical music and other music that uplifts your spirits enhances tissue healing and repair. Be sure to avoid loud, rock, dance and hip-hop music if you have adrenal fatigue. These melodies are far too stimulating and can further drain the adrenals.



MUSIC & THE BRAIN

Healing Powers
Listening to music can decrease anxiety, speed healing, increase optimism and decrease pain.

Incredible Memory for Sounds
Alzheimer's patients can recall and sing songs long after they've stopped recognizing names and faces. There is growing evidence that listening to music can help stimulate seemingly lost memories and even help restore some cognitive function.

Creativity Boost
Music boosts creative energies through the production of alpha and theta waves. Large influxes of alpha waves induce states of enhanced creativity while theta waves are associated with dreaming, learning and relaxing.

The key for boosting creative energies is to listen to the type of music you enjoy the most. If you want more inspiration in language and mathematics it would make sense to listen to music with singing, while music without words stimulates more artistic and visual senses.

The Mozart Effect
It's been thought that listening to classical music, particularly Mozart, enhances performance on cognitive tests. However, recent findings show that listening to any music that is personally enjoyable has positive effects on cognition.

Listening to music can make you learn better and has the power to enhance some kinds of higher brain function, such as reading and literacy skills, spatial-temporal reasoning, emotional intelligence and mathematical abilities - even children with attention deficit/hyperactivity disorder benefit in mathematics tests from listening to music beforehand.

Music Taps Into Primal Fear
There are certain sounds that humans automatically associate with death because they tap into our evolutionary fear of the screams of other animals (and other human beings). Scientists have dubbed these "discordant noises"; any noise that makes you feel very unpleasant falls into this category.

We know if we hear other living things making those discordant noises that we have to react because something bad is going to happen. Movie directors know this and make good use of it when deciding on the score for a film!

Babies Know Happy From Sad Songs
Babies as young as 5 months can distinguish an upbeat tune, such as "Ode to joy" from Beethoven's Ninth Symphony, from a lineup of gloomy tunes.

"Sound is a nutrient for the nervous system. Love your ears...they are much more important than you ever realized."
Prof. Dr. Alfred Tomati

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13. Positive Visualization:

Visualize yourself healthy and well – full of life, breathing deep and easy. What you picture and hold to strong enough in your mind, you will begin to manifest in your life. This is simple to do, empowering and FREE!! Doing this practice will help reduce stress and improve healing and rejuvenation processes.

14. Play More:

Humans and all mammals are biologically programmed to play. Just watch your children, cats and dogs, they prioritize rest and play above most other things. Engage in some restorative hobbies, play with your pets or kids and have fun!

15. Schedule Down-Time:

Schedule time where you can relax and read an enjoyable book or watch an uplifting movie or documentary. Be sure to avoid negative influences during this time.

Stay away from horror movies, loud music, media that challenges your value system and negative people. Create an environment that uplifts, encourages and empowers you.

16. Heal Your Gut:

One of the top causes of adrenal fatigue is leaky gut syndrome and infections H Pylori, Candida and SIBO. Follow a specific program to heal your gut while supporting your adrenals and you will see much faster results.

19. Eliminate Food Sensitivities:

Identify any major food sensitivities through either a lab test or biofeedback test and come off of these for 90 days. I typically start my adrenal fatigued patients on an elimination diet, where we remove the most common food irritants including gluten, grains, most dairy, eggs, sugars, corn, peanuts, soy and nightshade vegetables.

After a 4-6 week elimination diet, we begin to add these foods back and see if they cause stress and inflammation. There is a delicate walk to find the foods that are most tolerable while the body heals. Overtime, the body becomes stronger and has less sensitivity to foods in the future.

20. Consume Adequate Salts:

Minerals are essential to the production and utilization of stress hormones. Using the highest quality pink salts on your foods throughout the day is a great strategy to boost mineral content. My favorite salt brands include the pink salts you can get with Himalayan Sea Salt and Redmond's Real Salt. Celtic sea salt is another great brand.

In addition to salts, consuming celery, cucumbers, fermented vegetables like pickles, sauerkraut and sea vegetables (seaweeds) on a regular basis can improve mineral levels and stress hormone production and utilization.

21. Spend Less Time on a Cell Phone:

Your cell phone may be overstressing your system with negative EMF's. Research has shown that using your cell phone increases the stress response and inflammatory processes (6). Use it less often and when you do, have it on the speaker phone and as far from your body as possible.

Protect Yourself From Cell Phone Radiation



Do not use your cell phone when it is charging



Switch off your cell phone when you go to bed at night



Avoid carrying your cell phone in your pocket



Put your phone on airplane mode when you are not using its wireless functions



Use earphones (not a Bluetooth headset) so you won't have to put your cell phone close to your head



Choose to text instead of calling a person for little things



Avoid making or receiving calls in places with bad reception



If a long conversation is in place, opt to meet the person directly or call on a land line.

20. Laugh More:

They say that “laughter is our best medicine,” and this is true when it comes to the adrenals. Laughing helps to stimulate endorphins and other feel good neuropeptides that reduce the stress response and enhance the healing process.

Be careful not to over laugh! Uncontrolled laughing can be too stimulating, so keep it under control. General chuckles about your daily activities and light joking with friends can be very restorative.



Benefits of Laughter

- 1) Stimulates Endorphins
- 2) Reduces Stress Hormones
- 3) Enhances Creativity
- 4) Boosts Anti-Aging Hormones
- 5) Makes Life More Enjoyable

21. Get High Quality Sun Exposure:

Sun exposure on our skin not only helps to boost up vitamin D levels, but it also improves the ability of our mitochondria to produce energy for healing and repair. This helps take stress off of the adrenals and helps them to heal and regenerate faster (7).

Vitamin D is one of the best homeostatic regulators within our bodies and needed for healthy adrenal function. But our bodies also absorb biophotons from the sun, which are light particles that create reactions in our cells promoting DNA repair and synthesis

22. Take Epsom Salt Baths:

Epsom salt baths are relaxing and rejuvenating. The salts provide magnesium and sulfates to help support the health of your adrenals and liver detoxification. I recommend doing one for 30 minutes each night with lavender and chamomile essential oils in the water and diffusing in the air.

Dim the lights and play some light worship music or classical music and focus on deep breathing. This is an EXTREMELY restorative nightly ritual that will help you sleep deeper and feel more rejuvenated each morning when you wake.

23. Meditate and Pray Daily:

Meditation and prayer are extraordinarily restorative to the body, mind and the spirit. These techniques help to calm the mind and bring a state of peace and tranquility.

In 1 Peter, we're told to *cast all our anxiety on Him*, and we need to do so now more than ever. Researchers looked at individuals with engaged religious and spiritual lifestyle habits and found they have significantly better mental health and adapt more quickly to health problems ([8](#)).

Jesus says, “my yoke is easy and burden is light,” and He desires for us to give Him our struggles. We don't have to take the weight of the world on our shoulders. Take time each day to thank the Lord and give Him your struggles and I guarantee you will see an improved state of mind and an increase in the amount of peace and freedom you experience each day.

24. Stretch Your Body:

Doing light stretching or a yoga class can be one of the most beneficial things for individuals dealing with adrenal fatigue. Light movements and stretches, coupled with breathing techniques help to calm the adrenals, stimulate feel good endorphins and improve parasympathetic tone in the body.

Do 15 minutes of yoga each morning, or take a class at your local fitness center or on a DVD at your home. Be sure not to engage in an intense yoga session with more demanding positions or a hot yoga class as that can be too draining on your adrenals.

25. Keep a Gratitude Journal:

We often spend so much time focused on what is wrong and what we are frustrated by. Taking time each day to journal about what you are most grateful for can be one of the most powerful daily activities.

You can also incorporate this into your breathing, meditation and prayer practices where you remind yourself of what you are most grateful for. This will relax your mind, increase endorphins, reduce stress hormone production and stimulate parasympathetic tone in the body.

There are certain nutrients the body needs in order to produce efficient amounts of adrenal hormones. When we are under a lot of stress, we deplete these nutrients in order to produce adrenal hormones and metabolic energy.

The following nutrients will help you adapt more effectively to stress, take the pressure off of your adrenal glands and give you more stamina and a stronger resistance to developing adrenal fatigue and adrenal exhaustion. Here are the most important herbs and supplements to improve adrenal fatigue.



The infographic features a green background with a large, faint white leaf graphic. It lists various supplements in black boxes with white text. The top row includes Vitamin B5, Vitamin B6, and Vitamin C. The second row includes Magnesium and Trace Minerals. Below these is the heading 'Additional Beneficial Supplements:'. The third row includes Adaptogenic Herbs, Probiotics, and Amino Acids. The bottom row includes Adrenal Glandulars and Hormone Support. A logo for DrJockers.com is in the bottom right corner.

Vitamin B5	Vitamin B6	Vitamin C
Magnesium	Trace Minerals	
Additional Beneficial Supplements:		
Adaptogenic Herbs	Probiotics	Amino Acids
Adrenal Glandulars	Hormone Support	

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Key Nutrients Needed:

There are other nutrients such as using mitochondrial support with things like CoQ10, Alpha lipoic acid, N-Acetyl Cysteine, Acetyl-L-Carnitine that can be very helpful for adrenal function as well.

Additionally, anti-oxidant compounds that help to reduce inflammation in the body will cross-over and have a mild effect at improving adrenal function as well. However, I am focusing on the most important and widely recognized nutrients and support supplements for adrenal health.

Vitamin B5: Panthothenic Acid

This nutrient is vital for the production of Coenzyme A (CoA). This is one of the most important molecules needed to sustain life. CoA is a critical player in energy metabolism, and works to allow carbohydrates, fats and proteins to be used as fuel sources.

B5 is also necessary for the production of the stress hormone cortisol and the sex hormones estrogen and testosterone. Individuals who have adrenal fatigue are often depleting their B5 levels in order to produce cortisol and need to supplement in order to continue to produce cortisol and avoid adrenal exhaustion ([1](#)).

Additionally, they will need B5 in order to support mitochondrial energy production and healthy sex hormone levels. I will start clients on dosages ranging from 50 -100 mg – 2x daily.



Vitamin B6: Pyridoxine

Vitamin B6 is a major nutrient for the production of the neurotransmitters serotonin and dopamine which play a large role in mood, sleep, energy and mental drive. Additionally, B6 is a key part of the bodies ability to manufacture the stress hormones norepinephrine and epinephrine.

B6 is important for the balancing of sodium and potassium around every cell in the body and promoting red blood cell maturation and oxygen delivery to the cells of the body. B6 is commonly used to help individuals with depression, anxiety and hormonal imbalances ([2](#)).

I start clients on dosages ranging from 25-100 mg – 2x daily.

Vitamin C:

This anti-oxidant is directly involved with the production of cortisol in the adrenal cortex. In addition, it boosts the immune system and protects the adrenal tissue from excessive oxidative stress involved with heavy adrenal hormone production.

Studies have shown that vitamin C helps to modulate the levels of cortisol, epinephrine and norepinephrine in the blood stream (3).

I will start clients with 500-1000 mg – 2x daily in a buffered form in combination with an equivalent amount of citrus bioflavonoids which enhance the utilization of the vitamin C.



Magnesium:

Magnesium is one of the most used minerals in our body. We need roughly 1000 mgs/day for a healthy and active individual to keep up with the demands of the body. If you are under more stress, you will need 1500-2000 mgs per day. Magnesium's importance to the body is compared to oil for a car engine. Without it, we will sputter on fumes.

Roughly 68% of society does not consume the RDA level and many researchers believe that roughly 80% of Americans are consuming too little (4,5). Insufficient magnesium causes the body to struggle to utilize proteins and enzymes including producing neurotransmitters and hormones (such as cortisol, epinephrine, etc.). In addition, the body is unable to methylate and detoxify or utilize anti-oxidants such as vitamin C.

I start my clients on dosages ranging from 200-400 mg – 2-3x daily. I have seen this make a HUGE difference in energy, sleep, mood and creativity.

12

Mg

Magnesium

24,3050

2
8
2

Supplemental magnesium decreases sleep latency, improves sleep efficiency, and increases total sleep time in elderly.

Magnesium is a glutamate (NMDA) antagonist and GABA agonist.

For mild insomnia: 400-600 mg Magnesium Threonate, malate or glycinate per night.

Nearly 50% of older adults have insomnia, and most do not meet RDA for Magnesium intake



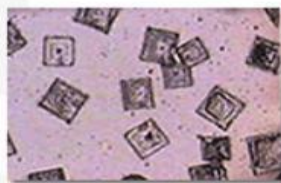
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Trace Minerals:

When we are in a state of adrenal fatigue, our physiological processes are moving fast and using up raw materials. This depletes key electrolytes and other minerals.

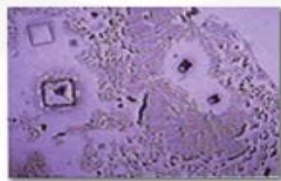
You can certainly supplement with trace minerals, but I recommend consuming sea vegetables such as dulse, nori and kelp. Additionally, consuming bone broth and soups and stews made with bone broth is excellent. Some veggies have a high amount of trace minerals such as celery and cucumbers.

I also recommend having pink salts such as Himalayan sea salt which has 84 trace minerals. Using a lot of good salts and good water is very important for someone dealing with adrenal fatigue.



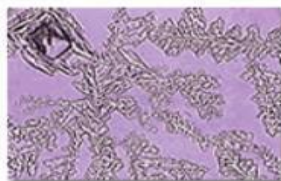
Common Table Salt

Stripped of all its natural elements through industrial processing. The result is Sodium Chloride only. The unnatural crystals are isolated from each other and dead. In order for the body to metabolize these crystals, it must sacrifice tremendous amounts of its own precious energy reserves. The salt deposits in our bodies look similar to the ones in this photo; isolated and dead.



Sea Salt

A great percentage of sea salt today is processed. With the ocean becoming increasingly polluted, this salt is far from ideal. It is composed of irregular and isolated crystalline structures, disconnected from the natural elements surrounding them. Consequently, the vital minerals, however many it may contain, cannot be absorbed by the body unless the body expends tremendous energy to vitalize them. The net gain is small with an even greater loss of energy.



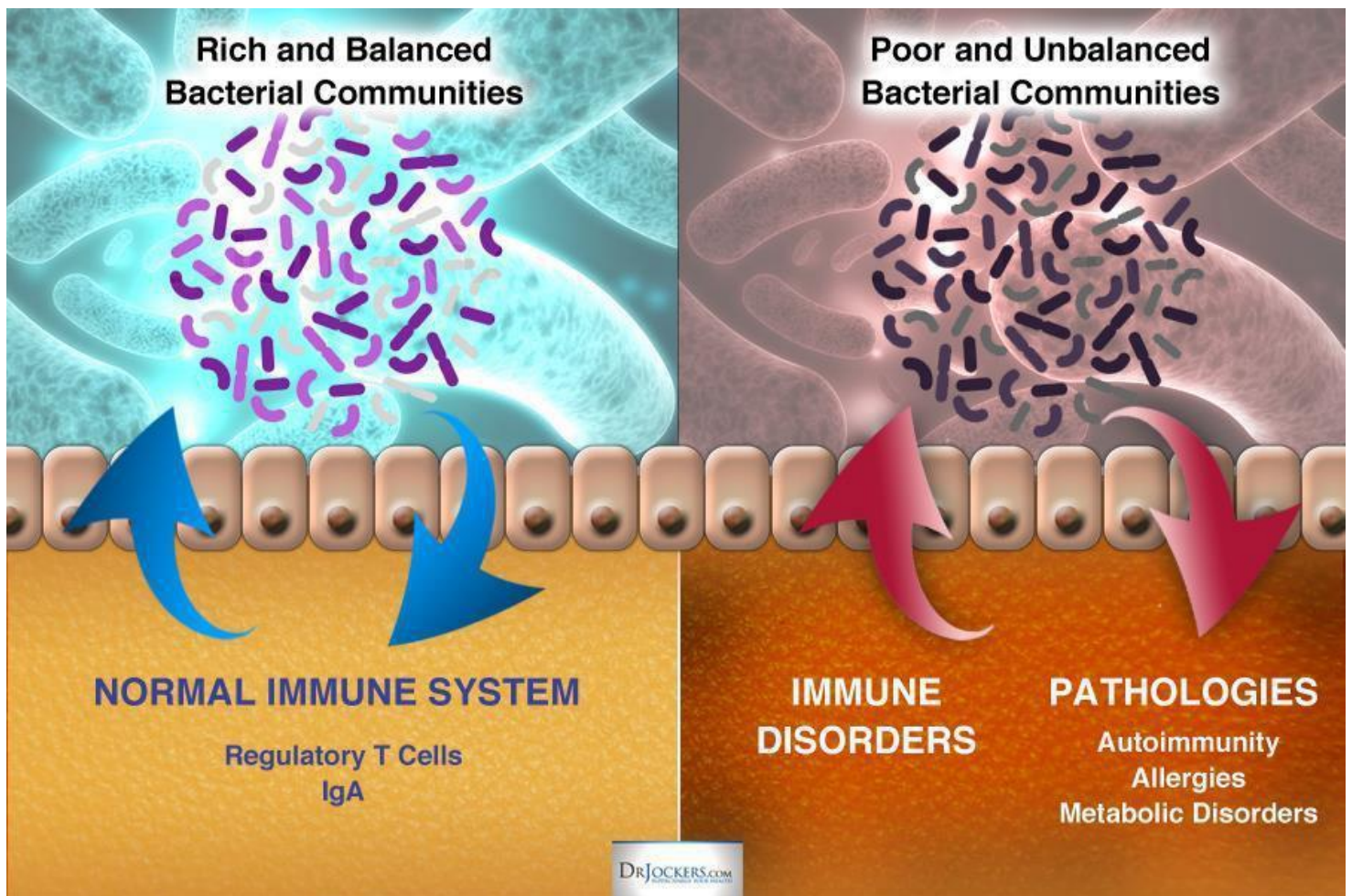
Himalayan Crystal Salt

The balanced crystalline structure reveals the fine branching with no shadows or rough edges. The crystal is not isolated from the inherent mineral elements (84) but is connected to them in a harmonious state. This tells us that the energy content, in the form of minerals, is balanced and can be easily metabolized by the body. This crystal is full of life. When taken into the body, it will have a vital energetic effect on the body. The result is a net gain for the body and zero energy loss.

Probiotics:

Adrenal fatigue is typically associated with a bad bacterial balance in the gut, called dysbiosis. When we are under chronic stress, we create an internal environment that favors the overgrowth of bad microbes and we are unable to heal the gut lining (6).

Probiotic supplements help to create balance in the microbiome, heal leaky gut and reduce stress on the body. I start my clients with the most powerful, research validated strains such as lactobacillus acidophilus and plantarum as well as Bifidobacterium longum and lactis. I will have clients take 30 - 100 billion CFU's daily away from meals to restore microbial harmony.



Herbal Adaptogens:

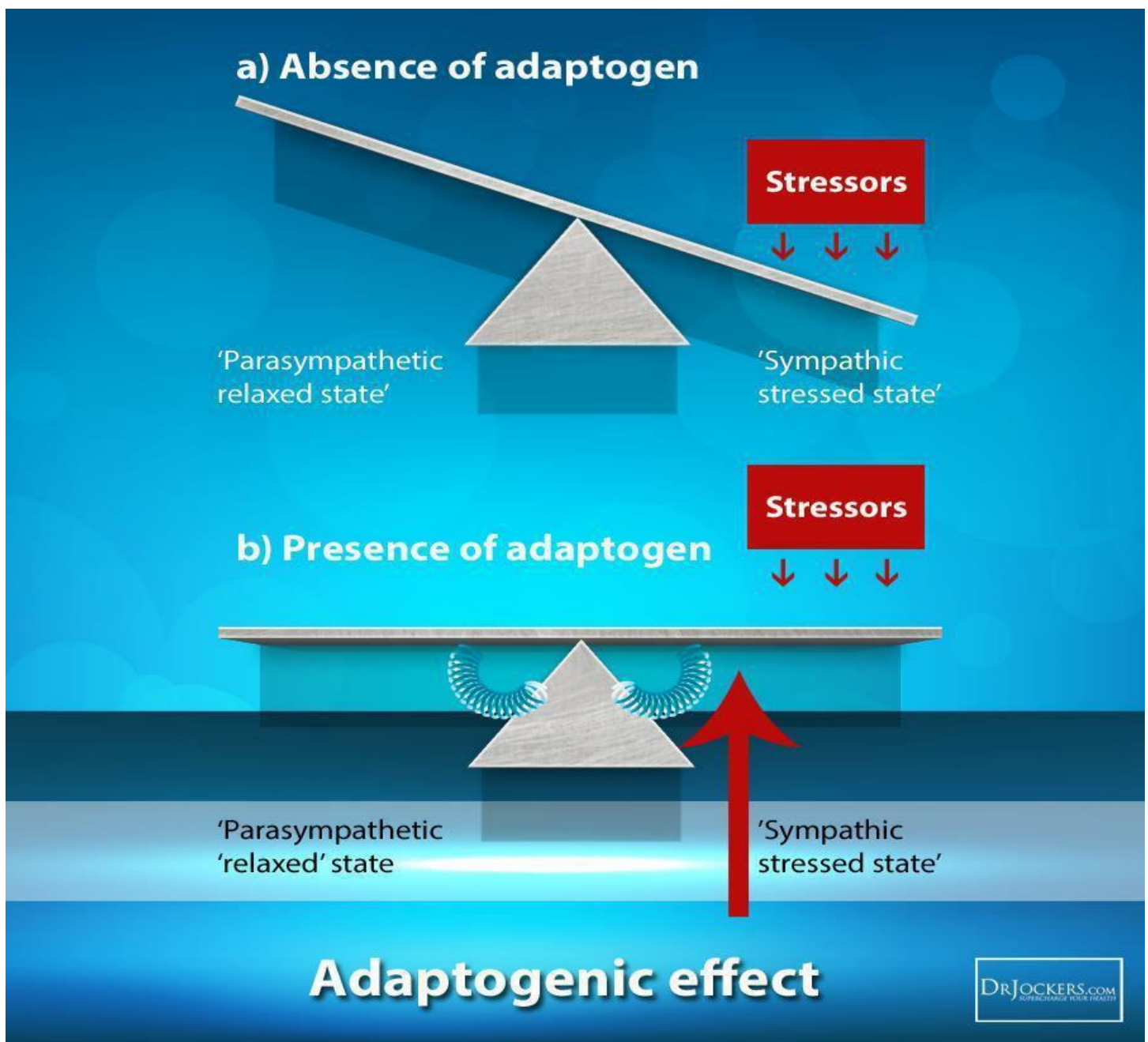
There are a specific group of plants with unique characteristics that are called adaptogenic herbs. These herbs help to coordinate how our body adapts to stress by modulating the utilization of our stress hormones (7, 8).

Adaptogens have adapted themselves over thousands of years of weathering extreme environmental stressors. Many of these grow in the mountains and in areas of extreme temperature ranges.

Rhodiola, as an example, grows in some of the coldest regions in the world, including Siberia, Arctic regions and the Appalachian Mountains in the Northeastern United States. It is also found in Scandinavia, Iceland, the mountain regions of Europe and Asia.

Mountains are known to face both extreme cold at night and extreme heat (due to their closer proximity to the sun) during the middle of the day. Plants like rhodiola and many other adaptogens have evolved to take on an array of anti-oxidant compounds that help them survive such harsh environmental conditions.

These herbs pass these beneficial anti-oxidant compounds onto us when we consume them. Not only do these compounds reduce oxidative stress, but they also help to promote physiological homeostasis by improving our HPA axis.



Adaptogenic herbs include Panax ginseng, ashwaghandha, rhodiola, cordyceps, astragalus, holy basil, Siberian ginseng (Eleuthero root) and maca as well as others. Start with small doses of these and gradually go up.

I typically will recommend these herbs in the morning and mid-afternoon for most people. Some adaptogens work well for reducing a high evening cortisol. Ashwaghandha in particular is good for this. Lemon Balm and lavender have adaptogenic qualities that also help to reduce higher evening cortisol and adrenaline levels.

Many of the other herbs such as cordyceps, rhodiola and ginseng are better at increasing your energy and mental clarity. If you take them at night they could possibly keep you up. These are great in the morning and mid-day or mid-afternoon.

Just like anything else, you may notice that you respond better to certain adaptogenic herbs better than others. If you notice the herbs make you more tired and inflamed during the day or stimulate you at night than it may be best to avoid them as you may be having a stress response to the herb itself.

Here is how I recommend using these herbs.

Ashwaghandha: Begin with 400mg – 1x per day and if you feel good using it you can gradually go up to 400-800 mg – 2x per day

Astragalus: Begin with 500mg – 1x per day and if you feel good using it you can gradually go up to 500 mg – 1000mg – 2x per day

Cordyceps: Begin with 400mg – 1x per day and if you feel good you can gradually go up to 400 - 800 mg – 2x per day

Panax Ginseng: Begin with 200mg – 1x per day and if you feel good you can gradually go up to 400mg – 2x per day

Holy Basil: Begin with 300mg – 1x per day and if you feel good you can gradually go up to 300 - 600mg, 1-2x per day

Maca: Begin with 1.5g -1x daily and if you feel good you can gradually go up to 1.5 -3.0 grams – 2x daily.

Rhodiola: Begin with 100mg -1x per day and if you feel good than go up to 100-200 mg – 2x per day

Siberian Ginseng: Begin with 100mg -1x per day and if you feel good you can gradually go up to 200 mg – 2x per day

For good sleep at night, I recommend diffusing lavender, chamomile or lemon balm (or some combination of all of these), beginning about an hour or two before bed. You can also put these in a bath and soak with Magnesium salts to help restore the adrenals and lower stress hormone production.



Licorice Root:

This herb, primarily the glycyrrhizinate portion, helps to raise up cortisol and aldosterone levels ([9](#)). This is only recommended in cases of low cortisol and hypotension. If one has hypertension, than they should avoid licorice root so as to not raise up aldosterone too high.

There is another form of licorice root called deglycyrrhizinated licorice root (DGL) that has the glycyrrhizinated portion removed. This is used to help reduce H Pylori and other pathogenic bacteria and to soothe the stomach and intestinal membranes.

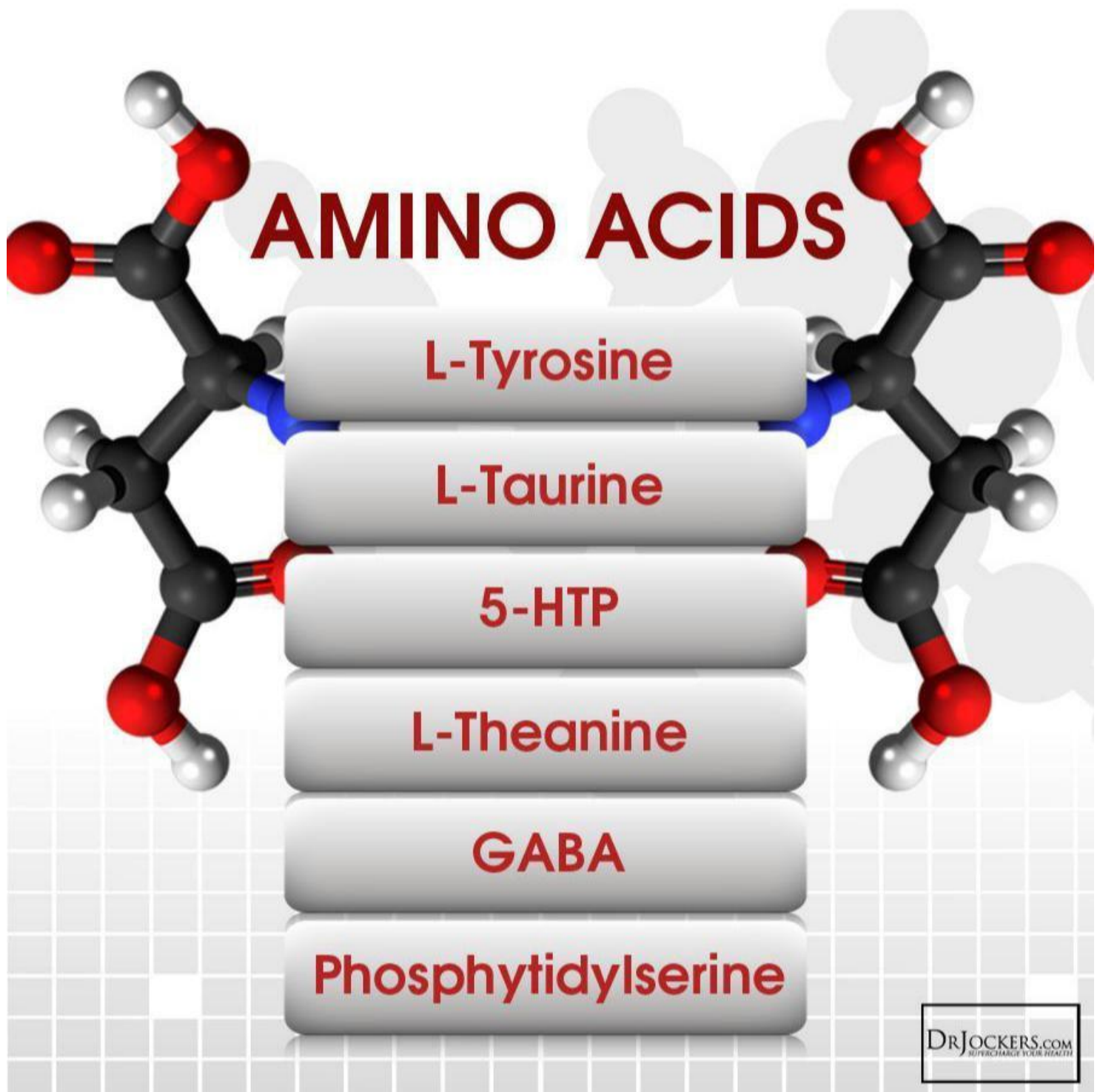
To support the adrenals however, we are looking for low doses of licorice root with the glycyrrhizinated portion still intact. I recommend this in 35mg droplets such as in this [product here](#). [Take 1-2 droplets at times when cortisol is low throughout the day.](#)

Adrenal Glandulars:

These are specific adrenal supplements that are made up of adrenal gland tissue from either porcine or bovine (pig or cow). Some of these supplements use the whole adrenal gland while others only use the outer cortex.

This can be an excellent overall supplement to help restore adrenal function as the glandulars are rich in mitochondrial support nutrients such as CoQ10, L carnitine, glutathione precursors, B vitamins and amino acids necessary for good adrenal function.

It is often good to look for supplements that also have pituitary and hypothalamic glandulars as well to support the entire HPA axis. Dr Wilson's formula [here](#) is the best I have found.



Amino Acids:

Certain amino acids can be very helpful for individuals with adrenal fatigue. Amino acids are best taken 30 minutes before a meal or 2 hours after a meal. This reduces competition with other amino acids from the meal that was consumed.

Here are the most commonly used amino acids for HPA dysfunction and adrenal fatigue:

L-Tyrosine:

This is an amino acid that is a precursor to the production of cortisol, dopamine, norepinephrine and epinephrine. For someone with low cortisol, using tyrosine may be helpful in the production. This should not be used by someone with high cortisol as it will help produce more.

If you choose to supplement with this, you should look for an improvement in focus and concentration.

Begin with 100mg, 1 time and if you don't notice anything or feel good with it, you can gradually bump this up going up 200 mg and ramp up to 500 mg max.

You can spread this out and take dosages 2-4 times daily. If you are feeling good with 500 mg, you can take that several times daily as well. If you notice anxiety, worsening fatigue and/or irritability, than drop the dosage down.

L-Taurine:

This is a neuroprotective amino acid that works to help maintain cell stability. It also has anti-oxidant activity and supplementation has been shown to increase the inhibitory neurotransmitter in the brain called GABA.

This should help improve sleep, mood, calmness and relaxation. Begin with 300 mg – 1x daily and you can ramp up to 1500 mg – 1-2x daily max. The safe upper limit without side effects is 3 grams daily.

5-HTP:

5-HTP (5-hydroxytryptophan) is a precursor to the neurotransmitter serotonin. It is easily absorbed in the intestines and has been shown to easily cross the blood brain barrier ([10](#)).

Serotonin is important for a number of brain activities, influences norepinephrine and dopamine, regulates mood and behavior, including food cravings. The use of 5-HTP has been shown to help improve a sense of calm and relaxation ([11](#)).

Serotonin in our brain helps us to feel good and calm, but also it is a precursor to the sleep hormone melatonin. Using 5-HTP supplementation for someone that needs this, should help that individual have improved mood and energy and sleep better. This shouldn't be taken by anyone who is currently using an SSRI type of anti-depressant.

If the individual is struggling with insomnia than use the following protocol. I typically begin with 50 - 100 mg at night before bed. From that point, if the individual is still not sleeping well, than try increasing the dosage by 50 mg every week until good sleep is attained or you reach the maximum 500 mg. Overtime, as the adrenals get better, you should be able to reduce the dosage.

L-Theanine:

This amino acid helps to modulate the HPA axis in such a way as to dampen excitatory neurotransmitter and alpha brain wave activity. This results in relaxation support and improved sleep quality ([12](#), [13](#), [14](#)).

Using 100 mg as a standard dosage is usually effective and titrating up by 50 mg each week if necessary to a maximal 500 mg can be done if necessary.

GABA:

GABA (gamma-aminobutyric acid) is an important inhibitory neurotransmitter found in 30% to 40% of the brain synapses. It helps calm the brain by neutralizing the excitatory effects of glutamate.

Research suggests that GABA supplementation or optimal GABA function in the brain positively affects neurological health, the body's response to stress, mood, alpha and beta brain waves and sleep ([15](#), [16](#)).

This can be great for someone with anxiety and insomnia in particular. It is said not to be able to cross the blood brain barrier in a healthy individual, but people with adrenal fatigue will have greater permeability in their blood brain barrier and will take up and respond to GABA.

Begin with 100 mg and gradually go up by 50mg per week if needed to a maximum dosage of 500 mg. The key is to find the right dosage that you feel best with.

A great overall supplement I use that has a combination of these amino acids is Mood Protect here



Phosphatidylserine:

This compound is great at improving hypothalamic-pituitary function. This is the key regulator in the HPA axis and it improves the feedback between the brain and the adrenals (17). You can take up to 600-800 mg orally as a highly effective dosage or do a topical application that crosses into the bloodstream transdermally.

I personally like to support the HPA axis with a combination supplement that uses a smaller dosage of phosphatidylserine and mitochondrial support with CoQ10, alpha lipoic acid, Acetyl L-carnitine and N-Acetyl Cysteine. This product has helped me and many of my clients dramatically improve adrenal health and mental energy.



Bioidentical Hormones:

I don't use hormone replacement with my clients and would rather focus on addressing major deficiencies, reducing toxicities and supporting the bodies healing process. With that said, there is a time and place for adrenal hormone support in the form of small doses of pregnenolone and DHEA.

However, please don't use them without the supervision of a qualified medical professional.

Pregnenolone:

This is the major precursor to many of the key hormones that are produced by the adrenal glands. It is best taken in the evening unless the individual notices it interfering with sleep. The normal dosage is 25mg. This is contraindicated in cases of hyperthyroidism and should never be taken after 6pm as it blocks GABA production and can lead to insomnia.

Warning signs of too much pregnenolone can include heart arrhythmia's including palpitations or abnormal heart rhythms, insomnia and/or headaches. If you have any of these while taking pregnenolone, than be sure to consult with your functional health practitioner.

The pregnenolone product I recommend for clients can be [found here](#)

DHEA:

This another precursor hormone for the production of both stress and sex hormones. Using this can be very helpful, but titrating the dosage can take clinical skill. The average adult dosage is typically between 10-25 mg but may start as small as 5mg. It is best to dose in small amounts (5mg several times throughout the day) to mimic what the body produces on its own.

DHEA is the precursor to the sex hormones testosterone and estrogen. If the individual has liver stress, methylation problems and/or a history of sex organ cancer such as breast, uterine, ovarian or prostate than it be best to avoid DHEA supplementation.

Starting with small doses is key as some women will turn DHEA into testosterone and increase the ir risk of Polycystic ovarian syndrome. Some men with elevated aromatase enzymes will turn this into estrogen. This is one reason why it is important to have a functional health practitioner trained in the use of these bioidentical hormones before starting usage.

Warning signs of poor DHEA utilization would include abnormal heart rhythms, increased blood pressure, insomnia, facial hair or hair loss. If you have any of these while using DHEA, immediately consult with your functional health practitioner. The DHEA product I recommend for clients can be [found here](#)

Summary:

There is a wide variety of key nutrients and compounds to support adrenal hormone and neurotransmitter production and the overall health of the HPA axis. Some of these nutrients you can begin supplementing with immediately, while others should only be used with the care of a trained practitioner.



HANDLING STRESS

Adrenal Fatigue Quiz

1. I struggle to wake up in the morning and will often hit the snooze button a few times?

True False

2. I frequently have poor memory, brain fog and sluggish thinking processes.

True False

3. I often crave salty foods

True False

4. I frequently have pain in my neck and upper back for no apparent reason.

True False

5. I need coffee and/or something sweet to get going in the morning

True False

6. I often feel nauseas in the morning after I get up.

True False

7. I frequently crave sugar throughout the day

True False

8. I have been unable to get to my ideal weight and physique despite diet and exercise.

True False

9. I have more challenges dealing with stress and pressure than I used too.

True False

10. I often feel lightheaded throughout the day and especially when I stand too quickly

True False

11. I feel especially tired in the mornings and the mid-afternoons

True False

12. I feel tired at night but then get a second wind around 10pm and have trouble sleeping.

True False

13. I often wake up in the middle of the night and have trouble falling back asleep afterwards.

True False

14. I have a much lower sex drive than I used too.

True False

15. It feels like I am aging prematurely

True False

16. I feel like my immune system is weak and I get colds often

True False

17. I never feel rested and I need to take a nap everyday

True False

18. I have been depending upon coffee and other stimulants to make it through the day

True False

19. I feel easily irritated and often have anxiety

True False

20. I commonly feel overwhelmed by the tasks I have everyday

True False

Results:

Count 1 point for every true answer you circled and 0 points for every false answer. Tally up your total points.

Total Score:

- 0-2:** Most likely good adrenal function
- 3-5:** You are at risk for adrenal fatigue
- 6-11:** You most likely are struggling with adrenal fatigue
- 12+:** You are most likely struggling with adrenal exhaustion

Your Score Is _____

****If you scored anywhere from 5+, than I would recommend following the AutoImmune Elimination Program to rebuild your adrenals, reduce autoimmunity and inflammation and strengthen your ability to adapt to daily stressors.**



The image features a 3D-rendered eBook cover on the left. The cover shows a woman with her hand to her forehead, looking distressed, against a background of virus-like particles. The text on the cover reads: "The 3 Most Important Nutrients for Healing Autoimmunity" and "AutoImmune Elimination Program".

To the right of the cover, there is a white text box with the following content:

**The 3 Most Important Nutrients for
Healing Autoimmunity**

If you are suffering with chronic inflammation and/or autoimmunity, then this e-book is for **you!**

Below this text is a red button with white text that says: **Get Your Free eBook**

About Dr David Jockers DC, MS, CSCS

Dr. David Jockers is a functional nutritionist and corrective care chiropractor. He currently owns and operates Exodus Health Center in Kennesaw, Georgia and runs one of the hottest natural health websites in DrJockers.com

He is the author of “**SuperCharge Your Brain: The Complete Guide to Radically Improve Your Mood, Memory and Mindset,**” and the **SuperCharged Recipe book** with over 180 full-color recipes to help you take back control of your health.



He has developed 5 revolutionary online programs with thousands of participants. These programs include E-guides, recipe guides, meal plans and video instructions including “The Sugar Detox,” “The Cancer Cleanse,” “Navigating the Ketogenic Diet,” “The Digestive Health Restoration Program” and the “AutoImmune Elimination Program.”

Dr Jockers is also a sought after speaker around the country on such topics as weight loss, brain health, healing leaky gut, thyroid function, natural detoxification and disease prevention.

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