

# **THE DOWNWARD SPIRAL OF STRESS: WHO PULLED THE PLUG?**

*It is estimated that 75 to 90% of all visits to doctors are due to stress-related disorders.*

**INADEQUATE DIET, INACTIVITY AND POOR MENTAL HABITS  
RESULT IN A DOWNWARD SPIRAL THAT MIGHT BE MORE ACCURATELY  
CHARACTERIZED AS A LONG, SLOW, DISTRESSING & AGONIZING DEATH**

**WHAT MUST YOU DO? TAKE CHARGE! YOUR LIFE DEPENDS UPON IT.**

All living creatures are subject to and respond to stress. When they stop responding they are what we call “dead.” Stressors are supposed by many to be outside us, imposed upon us, or of origins external to us. But stressors can also be inside us, that is, starting within us or of internal origin. In other words, stress is internal or external and can be emotional, chemical or physical. Whatever the origin, the progressive and measurable result of stress in the human system is what scientists call catabolism or “destructive metabolism,” that is, the gradual breakdown of tissues and systems over time. This gradual breakdown of tissues and systems over time is also called “aging.”

The good news about this insidious and somewhat mysterious process of stress and aging is that certain hormones and immune substances that respond to stress can be measured to evaluate your body’s physiological response to stress over time. The ability to measure your body’s response to stress over time allows one well-versed in the physiology of stress and stress-induced illness to draw critical conclusions that assist in the development of specific strategies for reversing the damaging effects of stress. Therefore, the ability to objectively measure your physiology’s maladaptation and its favorable response to stress-ameliorating strategies becomes a powerful tool in your concerted effort to reverse the damaging effects of stress, improve energy and vitality, influence favorably the process of aging and increase the potential for good health in the years that lie ahead.

The accumulated effect of stress, no matter what the origin, is predictable, and the response in the human system is, physiologically, essentially the same, whether the stressors are emotional (depression, worry, anger, fear, anxiety), chemical (sugar, caffeine, nicotine, drugs, alcohol) or physical (back pain, poor posture, lack of sleep, lack of exercise), internal (hereditary disorders, hyperactive thyroid, gut inflammation from food hypersensitivities, parasites or yeast) or external (impactful/catastrophic events, pollution, bacteria).

## **INTERNAL & EXTERNAL *STRESS* AFFECTS HEALTH AND AGING!**

### **EMOTIONAL**

Fear  
Anger  
Worry  
Depression  
Anxiety

### **CHEMICAL**

Sugar  
Caffeine  
Nicotine  
Drugs  
Alcohol

### **PHYSICAL**

Accidents  
Back Pain  
Poor Posture  
Lack of Exercise  
Lack of Sleep

### **INTERNAL**

Hereditary Disorders  
Hyperthyroidism  
Irritable Bowel Syndrome

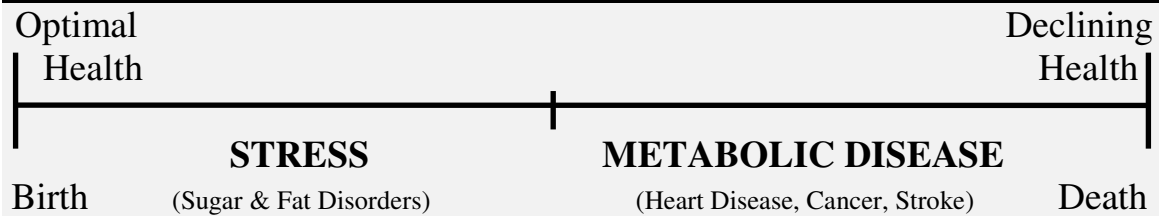
### **EXTERNAL**

Loss Of A Loved One  
Environmental Toxins  
Food Poisoning

Prolonged, chronic and/or recurring stress results in a predictable cascade of dysfunction that includes compromised energy production, increased fat accumulation and decreased immune function. Cells become less and less sensitive to insulin (a sugar balancing hormone) and it becomes increasingly difficult to get sugar out of the blood and into the tissues where it can do its work. As time passes, sugar and fat metabolism disorders are diagnosed in the office of your physician. Disorders involving sugar metabolism are eulogized as hypoglycemia (low blood sugar), diabetes (high blood sugar), or Syndrome X (insulin insensitivity at the cellular level), a pre-diabetic condition claiming an estimated 1.3 million new victims each year. An increase in cholesterol, triglycerides and stored fat, is subsequently diagnosed as hypercholesterolemia (elevated cholesterol), hypertriglyceridemia (elevated triglycerides), coronary artery disease, high blood pressure, or OBESITY, that unbelievably curious accumulation of fat – occurring slowly, over the years, or suddenly, in your thirties or forties, while you are doing the same things you have always done! Unfortunately, it doesn't stop here!

The immune system is progressively undermined as Secretory IgA, a primary defender against toxins, viruses and bacteria, plummets, predisposing you to opportunistic viruses, parasites and invasive bacteria. Cancer-fighting cells (Natural Killer cells – NK cells) decrease and anti-inflammatory agents (Interleukin 2 – IL-2) are diminished as arthritis, neuritis, colitis, heart disease, cancer and stroke establish a formidable presence in the human system. Salt and water retention, bone loss, lowered libido, disturbed sleep, fatigue, depression and allergies all have their origins in what is becoming commonly known as “STRESS-INDUCED ILLNESS.”

# PHYSIOLOGICAL EFFECTS OF STRESS



| ENERGY PRODUCTION           | OTHER INFLUENCES                        | IMMUNE ACTIVITY            |
|-----------------------------|---|----------------------------|
| Insulin Sensitivity ↓       | Osteoporosis (bone loss) ↑              | Secretory IgA ↓            |
| Sugar Utilization ↓         | Fat Accumulation ↑                      | Virus/Bacteria/Parasites ↑ |
| Blood Sugar ↑               | Protein Breakdown ↑                     | NK Cell Activity ↓         |
| Sugar Production ↑          | Salt & Water Retention ↑                | Interleukin 2 ↓            |
| Cholesterol/Triglycerides ↑ | <i>(Arrows imply increase/decrease)</i> | T-Lymphocytes ↓            |

|   |  |
|---|--|
| <ul style="list-style-type: none"> <li>Increased infections</li> <li>Chronic Fatigue Syndrome</li> <li>Yeast overgrowth</li> <li>Allergies</li> <li>Depression</li> <li>Sugar/Carbohydrate Intolerance</li> <li>Hypoglycemia</li> <li>Diabetes</li> </ul> | <ul style="list-style-type: none"> <li>Reduced Vitality</li> <li>Insomnia</li> <li>Hunger</li> <li>PMS</li> <li>Palpitations</li> <li>Coronary Artery Disease</li> <li>Hypertension/Stroke</li> <li>Obesity</li> </ul> |
|---|--|

Do I have your attention? Are you with me? Are you asking yourself, “Just how does this occur?” and, “If it affects me in this way, then what can I do about it?” These questions deserve to be answered, especially for those who wish to take charge of their own health and well-being, slow the aging process and protect themselves against the ravages of heart disease, cancer and stroke. So, might I suggest that you grab a spot of tea (herbal, preferably), kick off your shoes and get comfortable; we are about to embark upon an edifying journey that can, literally, change your life!

The physiology of stress is predictable, measurable and reversible! Did that register with you? Did you hear what I said? The physiology of stress is predictable, measurable and reversible! The latter, that it is reversible, is most intriguing and important to you and to me. So many patients have said to me, “Don’t tell me about it if you can’t fix it. I’d rather not know, than know and not be able to do anything about it!”

How many times have you gone to the doctor and before you leave he gives you a name for the “donkey in your bathtub”? That is, he or she provides a name (diagnosis) to describe your symptoms (joint pain, digestive distress, or headache). Yes, you’ve heard the names: Arthritis (joint pain), Irritable Bowel Syndrome (digestive distress), Fibromyalgia (muscle pain). Your doctor may order an array of assessments that assist in more specifically naming the “donkey” and come up with even more colorful names like Osteoarthritis or Ulcerative Colitis. He or she may preliminarily provide a “magic bullet”

(medication) that holds the promise of relief, enabling you to live more comfortably with the “donkey.” But what is often not discussed is how to get the “donkey” out of the bathtub. Now, if you are anything like the patients that I see, you don’t really want to know the “donkey’s” name so that you can learn to live with it, but rather, you want the “donkey’s” name so that you can communicate your desire (through lifestyle and therapeutic interventions), that the “donkey” find another home! All too often, you’ve been given a name for what ails you, and you use it to tell others when your “donkey” is acting up, as you continue to suffer from the persistent and often agonizing presence of the “donkey in your bathtub.” Now, doesn’t that just chap your “ass”? (donkey that is)

“You are going to have to live with it!” is too often heard from the lips of physicians, and all too often accepted by those who rely upon their guidance. Contrary to what you may have been told or may now believe, suffering, though an integral part of human existence, is not always necessary, nor should it be considered an unavoidable and persistent adjunct to the process of aging. After all, a candle burns just as brightly at its life’s end as it does when first lit! Is it possible that the candle of your life could burn just as brightly in the end as it does in the beginning?

If you suffer from ailments commonly associated with age or wish to avoid them, and you desire to regain energy long lost or retain the energy you now have, answers may be only as far away as you can “spit.” Hormones that show up in the saliva may give you the guidance needed to remove that blasted “donkey” from the “tub” and take that refreshing “bath” you’ve so longed for and missed. Or, if your “tub” has not yet been invaded, maybe you can avoid the “donkey” altogether. As my father used to say, “It’s not death and dying that has me concerned, it’s the pain and suffering getting there that’s got me a bit worried.”

You can “bet your bippy” that the predictable physiology of stress-induced illness is at the origin of many of the common complaints and symptoms you now suffer and these symptoms are the harbingers of more aggravating and potentially devastating things to come. Fatigue, depression, anxiety, irritability, inability to concentrate, loss of memory, palpitations, panic, PMS, headaches, digestive distress, allergies, and insomnia are only the beginning. When you look at the big picture, these symptoms might well be considered precursors to heart disease, cancer and stroke, the top three killers of men and women living in the “land of the free and the home of the brave” where stress has become a hallowed lifestyle rather than a transient visitor on the road to happiness and tranquility.

It is interesting to note that the highest average levels of the Stress Hormone (Cortisol) the world over occur in the population that inhabits the continent of North America. The significance of this fact will become more clear as the next few pages unfold a story rarely, if ever, told – **“R U InAMess With Stress?”**

This entire menagerie of symptoms, above described, often begins with the disturbance of what is called “the adrenal rhythm.” The adrenal glands, tiny trumpeters of the human stress response, are located on top of the kidneys and have two zones: an outer zone (cortex) and an inner zone (medulla). The outer zone produces hormones that are necessary to balance blood sugar (Cortisol), a precursor to the male and female sex



no rest for the weary. Your “adrenal rhythm” has been disturbed and it’s running hot! Just how long do you think you can last? There is a downside, and it’s not pretty!

### **ABNORMAL “ADRENAL RHYTHM” ADVERSELY AFFECTS:**

- ENERGY PRODUCTION
- IMMUNE SYSTEM HEALTH
- MUSCLE AND JOINT FUNCTION
- SKIN REGENERATION
- SLEEP QUALITY
- BONE HEALTH
- FAT METABOLISM
- THYROID FUNCTION

Elevated Stress Hormone levels: *kill brain cells*, specifically in the hippocampus, a center for learning and memory;

*suppress Secretory IgA*, an immune substance responsible for providing the first line of defense against toxins, viruses and bacteria;

*interrupt the action of osteocalcin*, an agent necessary for the passage of calcium into bones;

*disturb the body’s ability to utilize sugar*, creating an environment that encourages the development of sugar and fat metabolism disorders, including obesity, hypoglycemia, diabetes, Syndrome X, heart disease and stroke;

*suppress thyroid function*, reducing the metabolic fire that burns fat and produces energy;

*interrupt REM sleep*, also known as regenerative sleep, altering the mechanisms necessary for tissue healing and growth;

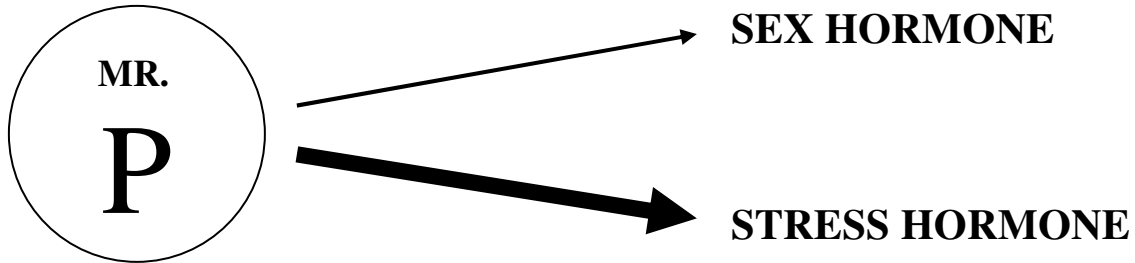
*decrease the number of Natural Killer cells* necessary to protect you from the onset of cancer; and

*suppress the production of IL-2* (Interleukin-2), an anti-inflammatory agent produced by the immune system, predisposing you to the ravages of the “itis” family (ARTHRitis, NEURitis, COLitis, BURSitis) that show up one night for dinner, and much to your chagrin, never leave.

Do you think you might want to reconsider? Are you now wondering what might happen next if elevated levels of Stress Hormone wreak havoc unchecked? Or, would you prefer not to know? There’s no need to fret! Let me assure you, there is a way to reverse this trend.

As this off-Broadway production (“Life in the Fast Lane”) continues, and stress, internal or external, is prolonged, you enter the second stage or second act of this maladaptive

process. Mr. P can no longer serve equally or equitably and preferentially shunts its provider material into the Stress Hormone pathway at the expense of Sex Hormone. This preferential shunting results in continued elevation of Stress Hormone and a diminishing supply of Sex Hormone.



At this juncture, we might wish to rename these offspring of adrenal stress, “StressMone” and “SexMone.” Aren’t these familiar sounds? Make them yourself and see how different they are. Go ahead, it may be enlightening, but above all, it may just be fun!

As we are propelled along the downward spiral of stress, the sounds of the former (StressMone) will echo throughout the day and night while the sounds of the later (SexMone) become less and less audible, often almost imperceptible. Can you now understand why some people may have their “libido torpedoed” as they get older. Yes, a divergence occurs and SexMone begins to fall or fails to rise in response to stress, while StressMone remains elevated, regardless of the eventual consequences. This second stage marks the early glimmerings of a physiologic maladaptation that eventually robs your body of the protective benefits of SexMone.

SexMone, (also called the “anti-aging hormone”), is the precursor for a plethora of sex hormones, including estrogens and testosterone, and *provides protection for your heart and brain.*

When SexMone is in short supply: *protection from the damaging effects of StressMone is compromised;*

*total cholesterol rises and LDL’s (“bad cholesterol”) increase in proportion to HDL’s (“good cholesterol”) predisposing you to cardiovascular disease and a sudden cardiac event (heart attack).*

The potential damage has just begun: *fat accumulates* at the expense of muscle mass and you become a victim of the enigma of “middle age spread”;

*bone density is at risk* as hormonal agents necessary for calcium uptake (into bone) are diminished and intestinal calcium absorption is compromised; *resistance to bacteria, viruses, parasites, allergy and cancer is decreased* as SexMone is unavailable to counteract the immunosuppressive effect of elevated StressMone; and *energy, vitality, restful sleep and mental clarity are significantly diminished.*

Are you getting my drift? It's not a pretty picture!

Imagine an old, fat, brittle-boned, insomniac, with chronic fatigue, parasites, cancer, heart disease, and dementia. This is not a compelling future! The good thing about this pitifully poignant picture is that it speaks of possibility, not reality. You have free will and can choose to "dance", strong and independent, filled with the joy and happiness you truly deserve, until your Beloved reaches out His hand and the DJ plays, "Save the Last Dance for Me." The choice is yours!

### **"Here Comes the Judge!" – IT'S SELF ASSESSMENT TIME**

- Do you have the energy you once had?
- Do you suffer from muscle or joint pain?
- Do you sleep well?
- Are you fatigued all or most of the time?
- Are there times when your brain seems clouded or you just can't concentrate?
- Have you become forgetful?
- Are you depressed?
- Do you have digestive distress, pass gas or belch a lot?
- Are you allergic to food or something in your environment?
- Does your heart race without provocation?
- Do you suffer from anxiety or panic?
- Do you have frequent headaches?
- Do you suffer with the aggravation caused by PMS?
- Are you hungry, even shortly after eating a satisfying meal?
- Have you gained weight and find it hard to lose?
- Have you been sick more than once in the past 5 years?
- Have you been diagnosed with a blood sugar problem?
- Do you have high cholesterol or triglycerides?

**If you answered YES to any of the questions above, then you are most likely suffering from the damaging effects of stress and are in the midst of symptoms commonly associated with stress-induced illness. The good news is - it's much easier to hit the target when you know where it is. Thank God! Now you know!**

This process is both insidious and devastating. It is both gradual and sudden. Out of nowhere, it can grab you by the throat, throwing you to the ground as you struggle for breath, faced with the horror of a sudden cardiac event, a diagnosis of cancer or the paralyzing fear of a massive stroke. However, over this seemingly devastating process -- the damaging impact of stress on the human system -- you do have control! But, you must "step up to the plate" and do what is necessary to reverse the downward trend. Are you willing to take the necessary steps, or do you wish to ignore the facts and suffer the consequences? My guess is that you are willing to take the necessary steps or you wouldn't be reading about this subject in the first place.

The third stage in the downward spiral of stress occurs when stress is not only prolonged but has become chronic. The divergent pattern of StressMone and SexMone previously observed continues as StressMone remains elevated and SexMone continues to fall. In

this stage the total amount of StressMone, though still elevated, diminishes as the process of maladaptation continues. SexMone proceeds to a level that is sub-normal and all the potential damaging effects associated with diminished SexMone are fully expressed. Yet, there is still more to come! Prolonged, chronic stress propels you farther along this downward spiral, and into stage four.

Remember, early on, when I said that stress is internal or external, and can be physical, chemical or emotional? In other words, you could be propelled into the third and fourth stage of adrenal maladaptation by chronic pain or inflammation, poor dietary habits, gut inflammation, lack of exercise or sleep, dissatisfaction with life or work, persistent worry or anxiety, frequent episodes of anger or frustration, or fear of failure. The stress you have suffered or now suffer, from whatever source it may come, relieved at this time or not, has planted the seed for potentially devastating physiological effects that remain, internally expressed, even when the source of stress is removed. That is, the maladaptation that occurs physiologically, as a direct response to prolonged and/or chronic stress, does not return to normal when the source of the stress is gone. Though the damaging effects may be slowed, a process set in motion and the deleterious effects of the divergence of Stress and Sex Hormones continues.

In stage four, StressMone and SexMone have fallen to suboptimal levels. The beneficial effects of both are now lost or severely undermined. Energy necessary to pursue life's pleasures has faded as StressMone and SexMone are unavailable to perform their important roles in energy maintenance and vital organ protection, and you are about to sink further into the abyss of adrenal fatigue.

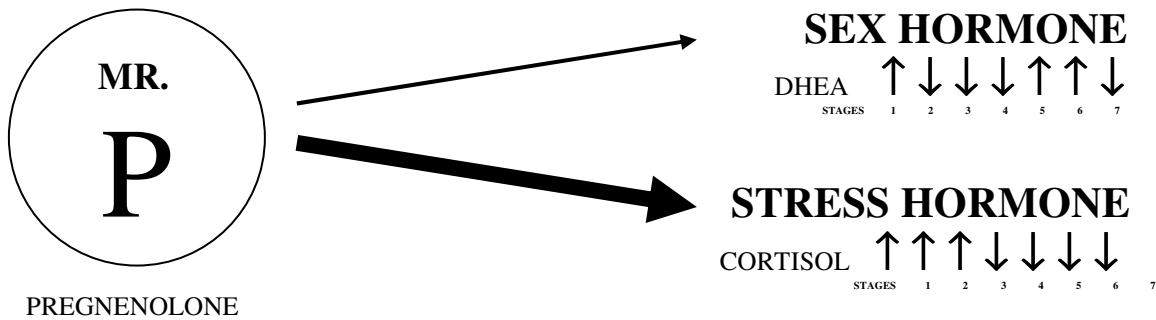
Adrenal fatigue, the fifth stage, is a curious "buggar." It is characterized by a SexMone rebound. Sounds exciting? Unfortunately, a rise in SexMone is due to the exhaustion of the zone within the adrenal gland responsible for producing StressMone. This zone has become unresponsive to Mr. P. Therefore, Mr. P is now more available to support the production of SexMone, short term. Although SexMone is rising, contrary to what you might conclude, this is not the time for clandestine sexual encounters, though I can't say that there are any studies to confirm this conclusion.

At this stage, your health demands, not calls for or requests, but demands your immediate attention. SexMone is only temporarily on the rise as you enter the final stages in the downward spiral of stress. Again you might ask, "Could this be a sign of your 'last fling before the fat lady sings'?" Just kidding! As StressMone continues to fall and SexMone rises you enter stage six of a seven-stage process. Those in stage seven will usually be found in a hospital, as the adrenals have "failed." Lucky for you and for me, the physiology of stress-induced illness is measurable, predictable and reversible. You and I should be especially grateful that it is reversible! We have choice, free will, the ability to change, and don't have to wait for the final stages. You can choose to take action, seek the guidance of one well-versed in the physiology of stress and its amelioration, specifically alter your dietary, exercise, and emotional habits, and significantly slow or stop the process, reversing its deleterious and damaging effects. What is absolutely required is the willingness to do whatever it takes to combat the destructive forces that have been set in motion. Now, let's review!

## The Downward Spiral of Stress: Who Pulled the Plug? “CLIFF NOTES” VERSION

1. Stress can be internal or external, **emotional** (worry, fear, anger, frustration) **chemical** (nicotine, caffeine, alcohol, dietary indiscretion) or **physical** (pain, poor posture, lack of or excessive exercise, loss of sleep).
2. Sugar and fat metabolism disorders - including **Syndrome X** - are the harbingers of the devastating effects of adrenal stress.
3. The **signs and symptoms of adrenal stress** include: excessive fatigue, depression, poor memory, inability to concentrate, irritability, insomnia, hunger, increased infections, PMS, digestive distress, palpitations, headaches, bone loss, fat accumulation, loss of muscle mass, salt and water retention, dizziness upon rising, allergies, dry or thin skin, and more.
4. These symptoms should be considered the **early signs of metabolic disease** (i.e. heart disease, cancer, stroke, arthritis, neuritis, colitis).
5. The effects of stress on the human system can be measured. **Stress and Sex Hormones show up in the saliva.**
6. Elevated **Stress Hormone** (Cortisol) kills brain cells, affecting memory and learning; depresses immune function, predisposing one to opportunistic viruses, toxins and bacteria; suppresses thyroid activity, promoting fat accumulation and obesity; interrupts the deposition of calcium into bone, encouraging osteoporosis; disturbs REM sleep, necessary for tissue healing; and reduces natural killer cells, which provide protection against cancer.
7. **Sex Hormone** (DHEA) is a protective hormone, protecting the tissues of the brain and heart. When it is in short supply, cholesterol rises, libido falls, fat accumulates at the expense of muscle mass, and bone density is compromised.
8. Cumulatively, this process is called **aging!**
9. The downward spiral of stress and **stress-induced illness is reversible.** The aging process can be slowed and the quality of your life improved. The choice is yours!
10. **Assess your current adrenal status** and take appropriate action. Seek guidance from one well-versed in the physiology of stress and stress-induced illness and alter your lifestyle choices to ameliorate the damaging effects of stress.

## *The Adrenal Hormones and Their Response to STRESS*



### 1. A Normal vs. Adapted Stress Response:

Stress and Sex Hormones rise under the influence of acute stress and return to normal once the acute stress is removed! If, however, acute stress is frequently repeated or stressors are stacked one on top of the other over an extended period, then, after the stressors are finally removed, Stress and Sex Hormones remain elevated and do not return to their normal, pre-stress levels.

### 2. A Prolonged Stress Response:

Mr. P preferentially shunts its Provider Material into the Stress Hormone pathway at the expense of Sex Hormone! Sex Hormone does not rise or may begin to fall.

### 3. A Chronic Stress Response:

Mr. P continues to preferentially shunt its Provider Material into the Stress Hormone pathway at the expense of Sex Hormone. Sex Hormone falls!

### 4. A Prolonged Chronic Stress Response:

The zone in which Stress Hormone is manufactured is becoming exhausted and is not as responsive to the presence of Mr. P. This results in a reduction of Stress Hormone. Sex Hormone has, by now, hit rock bottom!

### 5. Adrenal Fatigue

The zone in which Stress Hormone is manufactured is marginally functional and largely unresponsive to Mr. P. Mr. P is now more available and the zone producing the Sex Hormone is still responsive. Thus, a Sex Hormone (DHEA) rebound begins.

### 6. DHEA Rebound

Sex Hormone rebound continues as Stress Hormone has lost its “rhythm” --- circadian that is. Stress Hormone is not high in the morning and low at night any longer, but rather, it is low all day long!

### 7. Adrenal Failure

The zones producing Stress and Sex Hormones no longer respond favorably to Mr. P and the production of Mr. P may, in and of itself, be compromised. Stress and Sex Hormones are “in the pits” (i.e. pitifully little is “in the spit”).

Now that you know..... you know you know..... and, you are NOW in control. So, the only thing left is to “walk the walk.”

#### TAKE CHARGE!

As you now know, StressMone (Cortisol) and SexMone (DHEA) show up in your saliva and make evaluation of the impact of stress convenient and painless. Literally speaking, personalized guidance for improved health and vitality is only as far away as you can “spit.”

To measure where you now stand (physiologically), and subsequently evaluate the favorable impact of lifestyle changes you may make, treatment you may receive and/or nutritional or pharmacological interventions you may utilize, ask a physician (DC, MD, DO, AP) specializing in functional medicine to perform an “Adrenal Stress Test” (a salivary assessment of adrenal hormones).

After your initial adrenal hormone assessment, subsequent assessments can be used in evaluating your progress. Physiologically marking your position along the downward spiral of stress provides empowering guidance for you and your physician as you implement specific strategies to ameliorate the damaging effects of stress.

This is the moment of decision! Will you take the necessary steps to regain and retain your personal health and vitality?

The quality of life you deserve (now and in the future) depends upon it!