

Stress Management

INTRODUCTION

Stress is defined as any disturbance—for example, heat or cold, chemical toxin, microorganisms, physical trauma, strong emotional reaction—that can trigger the “stress response.” How an individual handles stress plays a significant role in determining their level of health. Comprehensive stress management involves a holistic approach designed to counteract the everyday stresses of life. Most often, the stress response is so mild it goes entirely unnoticed. However, if stress is extreme, unusual, or long-lasting, the stress response can be overwhelming and harmful to virtually any body system.

THE GENERAL ADAPTATION SYNDROME

The stress response is part of a larger response known as the General Adaptation Syndrome (GAS), a term coined by the pioneering stress researcher Hans Selye. The GAS is composed of three phases: alarm, resistance, and exhaustion.¹ These phases are largely controlled and regulated by the adrenal glands.

The initial response to stress is the *alarm reaction*, which is often referred to as the *fight-or-flight* response. The fight-or-flight response is the result of the activation of the sympathetic nervous system and hypothalamic-pituitary-adrenal (HPA) axis.

The fight-or-flight response is designed to counteract danger by mobilizing the body’s resources for immediate physical escape from danger. As a result:

- The heart rate and force of contraction of the heart increases to provide blood to areas necessary for response to the stress situation
- Blood is shunted away from the skin and internal organs, except the heart and lung, while the amount of blood supplying the required oxygen and glucose to the muscles and brain is increased
- The rate of breathing rises to supply the necessary oxygen to the heart, brain, and exercising muscle
- Sweat production increases to eliminate toxic compounds produced by the body and to lower body temperature
- And blood sugar levels rise dramatically as the liver converts stored glycogen into glucose for release into the blood stream

The *resistance reaction* allows the body to continue fighting a stressor long after the effects of the fight-or-flight response have worn off. Here, corticosteroids secreted by the adrenal cortex are largely responsible for the resistance reaction. For example, these hormones increase blood glucose levels and stimulate the conversion of protein to energy so that the body has a large supply of energy long after glucose stores are depleted. They also promote the retention of sodium to keep blood pressure elevated.

As well as providing the necessary energy and circulatory changes required to deal effectively with stress, the resistance reaction provides the changes required to meet emotional crisis, perform strenuous tasks, and fight infection. The effects of adrenal cortex hormones are quite necessary when the body is faced with danger, but prolongation of the resistance reaction or continued stress increases the risk of significant disease (including diabetes, high blood pressure, and cancer) and results in the final stage of the GAS, exhaustion.

Exhaustion may manifest as a partial or total collapse of a body function or specific organ. Two of the major causes of exhaustion are loss of potassium ions and depletion of adrenal glucocorticoid hormones like cortisone. Loss of potassium results in cellular dysfunction and, if severe, cell death.

Another cause of exhaustion is weakening of the organs. Prolonged stress places a tremendous load on many organ systems, especially the heart, blood vessels, adrenals, and immune system.

DIAGNOSTIC CONSIDERATIONS

Since activation of the HPA is one of the fundamental aspects of stress, salivary measurement of cortisol, alone or in combination with dehydroepiandrosterone (DHEA), is now recognized as being a general indicator of HPA activation and how well an individual responds or is dealing with stress, although there is a tremendous intra- and interpersonal variation.² Prolonged elevation in cortisol is now associated with many chronic diseases, including diabetes, high blood pressure, osteoporosis, Alzheimer’s disease, and depression. (See Figure 1) Furthermore, with prolonged

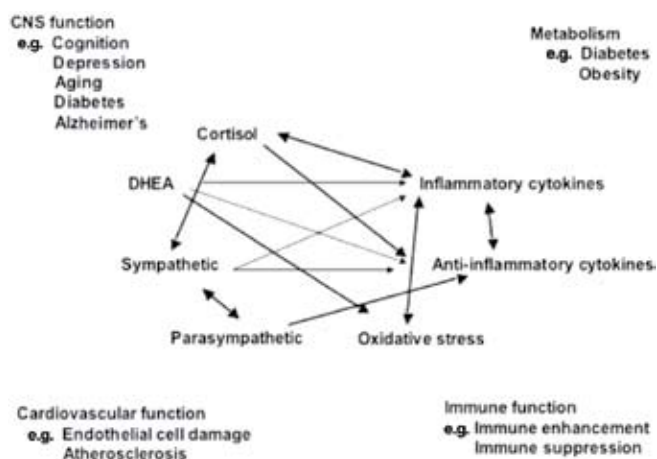


Figure 1* Mediators of stress and allostasis operate in a non-linear network. Non-linear network of mediators of allostasis involved in the stress response. Arrows indicate that each system regulates the others, creating a non-linear network. Note that many body systems are influenced by the same mediators.

stress the levels of DHEA tend to be reduced. So, identifying patterns in the morning versus late-night cortisol or the ratio of DHEA to cortisol is a useful, objective measure of how severely stress might be affecting biological functions. These tests can not only be used to identify a disturbance, but also to measure therapeutic effect (See Figure 2).

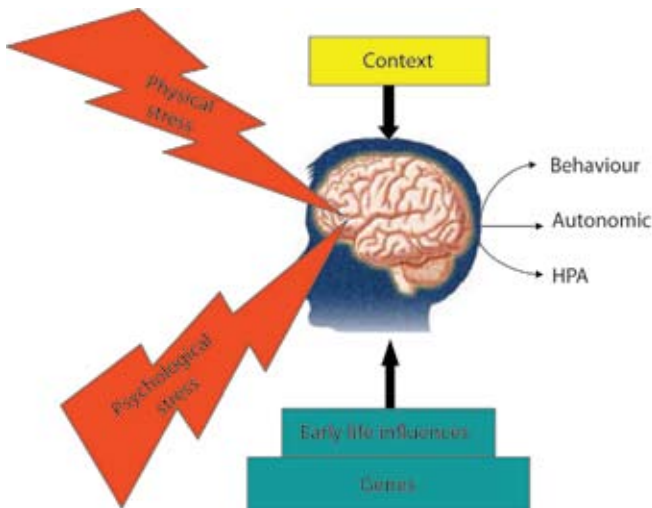


Figure 2 Physiological and pathological responses to stress. The resilience or vulnerability of any one individual to stressful situations in adulthood will depend upon that person's genetic inheritance and early life experiences.

THE CLINICAL APPROACH

Whether currently aware of it or not, the patient has developed a pattern for coping with stress. Unfortunately, most people have found patterns and methods that ultimately do not support good health. Negative coping patterns must be identified and replaced with positive ways of coping. The clinician should try to identify any negative or destructive coping patterns that the patient may have developed, and should attempt to replace that pattern with more positive measures for dealing with stress.

Stress management can be substantially improved by assisting the patient in the following six equally important areas:

- Sleep
- Techniques to calm the mind and promote a positive mental attitude
- Lifestyle factors
- Exercise
- A healthful Mediterranean diet designed to nourish the body and support physiologic processes
- Dietary and botanical supplements designed to support the body as a whole, especially the HPA and, specifically, the adrenal glands.

The Importance of Sleep

Sleep quality is one of the most important considerations in stress management. Insufficient sleep, poor sleep quality, or sleep deprivation can all significantly activate or exacerbate stress.³ Over the course of a year, over one-half of the US population will have difficulty falling asleep. About 33% of the population experiences insomnia on a regular basis. Even in the patient who does not exhibit insomnia, if their sleep is often disrupted or they do not spend sufficient time in the deeper stages of sleep, they will be affected in

profound ways. The importance of sleep and techniques to improve sleep quality are the subject of a separate Clinical Highlight.

Calming the Mind and Body

Learning to calm the mind and body is extremely important in relieving stress. Among the easiest methods for the patient to learn are relaxation exercises. The goal of a relaxation technique is to produce a physiologic response known as a *relaxation response*—a response that is the exact opposite of the stress response. Although an individual may relax by simply sleeping, watching television, or reading a book, relaxation techniques are designed specifically to produce the relaxation response.

Relaxation response was a term coined by Harvard professor and cardiologist Herbert Benson in the early 1970s to describe a physiologic response that is just the opposite of the stress response. With the stress response, the sympathetic nervous system dominates. With the relaxation response, the parasympathetic nervous system dominates. While the sympathetic nervous system is designed to protect against immediate danger, the parasympathetic system is designed for repair, maintenance, and restoration of the body.

The relaxation response can be achieved through a variety of techniques. The methodology should be determined by patient interest, because all techniques have the same physiologic effect—a state of deep relaxation. The most popular techniques are meditation, prayer, progressive relaxation, self-hypnosis, and biofeedback. To produce the desired long-term health benefits, the patient should use the relaxation technique for at least 5 to 10 minutes each day.

Producing deep relaxation with any technique requires learning how to breathe. One of the most powerful methods of producing less stress and more energy in the body is by breathing with the diaphragm. Diaphragm breathing activates the relaxation centres in the brain.

Lifestyle Factors

A patient's lifestyle is a major determinant of his or her stress levels. The two primary areas of concern (other than addressing negative coping patterns) are time management and relationship issues. In addition, the importance of getting quality sleep cannot be overstated in a stress management program and regular physical exercise can produce a tremendous effect in terms of improving mood and the ability to handle stressful life situations.^{4, 5}

Dietary Guidelines

An individual suffering from stress or anxiety must support the biochemistry of the body by following some important dietary guidelines. Specifically, he or she must:

- Eliminate or restrict the intake of caffeine
- Eliminate or restrict the intake of alcohol
- Eliminate refined carbohydrates from the diet
- eat a diverse range of whole foods
- Increase the potassium-to-sodium ratio
- Eat regular-planned meals in a relaxed environment
- Control food allergies

According to Selye, whether or not stress is harmful depends on the strength of the system. From a purely physiologic perspective, it can be strongly argued that the delivery of high-quality nutrition to the cells of the body is the critical factor in determining the strength of the system.

The average American consumes 150 to 225 mg of caffeine daily, or roughly the amount of caffeine in two cups of coffee. Although

most people can handle this amount, some people are more sensitive to caffeine's effects than other people, owing to decreased activity of phase I detoxification. Even small amounts of caffeine can affect sensitive people, whereas those with normal sensitivity respond to large amounts. Excessive caffeine consumption can produce caffeineism characterized by symptoms of depression, nervousness, irritability, recurrent headache, heart palpitations, and insomnia. People prone to feeling stress and anxiety tend to be especially sensitive to caffeine.

NUTRITIONAL AND BOTANICAL SUPPORT

Nutritional and botanical support for the individual experiencing signs and symptoms of stress largely involves attempting to restore proper HPA function as well as adrenal responsiveness. An abnormal adrenal response—either deficient or excessive hormone release—significantly alters an individual's response to stress. Often, the adrenals become “exhausted” as a result of the constant demands placed on them. An individual with adrenal exhaustion usually suffers from chronic fatigue and may complain of feeling “stressed out” or chronically anxious. He or she typically has a reduced resistance to allergies and infection.

Nutritional Supplements

The nutrients especially important for supporting adrenal function are vitamin C, vitamin B6, zinc, magnesium, and pantothenic acid. Each of these nutrients plays a critical role in the health of the adrenal glands, and in the manufacture of adrenal hormones. During stress, the levels of these nutrients in the adrenals decrease substantially. Taking a high potency multiple vitamin and mineral formula is very important for providing necessary levels of these key anti-stress nutrients.

L-Theanine

L-theanine is an amino acid found in tea leaves, particularly green tea (*Camellia sinensis*). Much like GABA, L-theanine exerts a profoundly relaxing, yet non-drowsy effect with noticeable effects within 5 to 15 minutes of ingestion. Clinical studies have demonstrated that L-theanine is an effective nutrient to help manage stress and promote mental calmness.⁶ These clinical effects are directly related to L-theanine's ability to stimulate the production of alpha brain waves as well as reduce beta waves (associated with nervousness, scattered thoughts and hyperactivity). The clinically-proven form of L-theanine is Suntheanine®, a pure and natural form produced via an enzymatic process. Although most individuals would achieve results with L-theanine, some people would respond better with GABA, especially during acute stressful situations.

PharmaGABA

As a key neurotransmitter, GABA (gamma-aminobutyric acid) is an important regulator of proper neurological function. It appears that many people with anxiety, insomnia, epilepsy, and other brain disorders do not manufacture sufficient levels of GABA. Since GABA does not cross the blood-brain barrier very well, virtually all of the GABA found in the brain is manufactured there. There has been some controversy regarding the transport of supplemental GABA across the blood-brain-barrier, yet supplementation with a natural form of GABA has shown clinical effects in activating the parasympathetic response, increasing alpha brain waves and promoting feelings of relaxation with greater mental focus and clarity.^{7, 8} The mechanism of action appears to take place via a peripheral mechanism. The clinically-proven form is PharmaGABA, a special form of GABA naturally manufactured from *Lactobacillus hilgardii*—the bacteria used to ferment vegetables in the preparation of the traditional Korean dish known as kimchi.

PharmaGABA has shown impressive results in combating stress, including showing an ability to lower cortisol levels and other markers of acute stress during exposure to stressful situations.⁹ The recommended dosage schedule for PharmaGABA is 100 to 200 mg up to six times daily (See Figure 3).

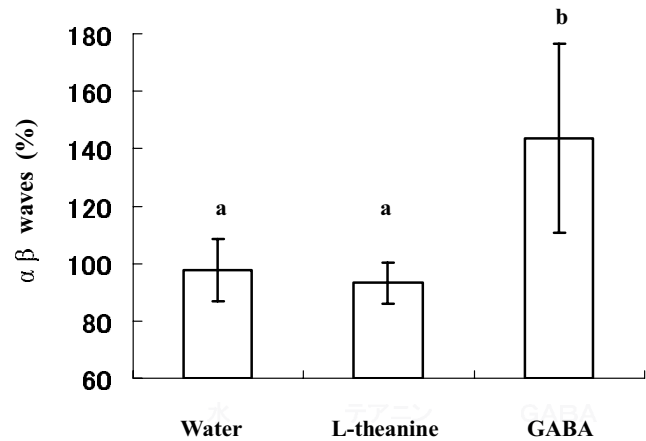


Figure 3 Changes of alpha/beta waves ratio values after administration of water (control), L-theanine, and β -aminobutyric acid (GABA) measured by electroencephalogram (EEG). Values are means \pm SEM of alpha/beta ratio values of 3 measurements (at 0, 30, and 60 minutes after each administration). Values with different letters are significantly different at $P < 0.05$.

Key Botanical Medicines

There is a long list of botanical medicines useful for dealing with stress, anxiety, insomnia, and supporting the adrenal glands; botanical medicines that support adrenal function are among the most useful. Most notable are the ginsengs. Both Chinese ginseng (*Panax ginseng*) and Siberian ginseng (*Eleutherococcus senticosus*) exert beneficial effects on adrenal function and enhance resistance to stress.^{10, 11} In addition, Sensoril, a special extract of *Withania somnifera* and *Rhodiola roseacea* (artic root) has shown impressive results in recent studies.^{12, 13} All of these botanicals are often referred to as “adaptogens.” An adaptogen is a substance with the following characteristics:

- Demonstrates nonspecific effects, such as increasing resistance to physical or biological stressors
- Possesses a normalizing influence on the body
- Does not disturb body functions already within the normal range
- Must be very safe
- Restores vitality in debilitated and feeble individuals
- Increases feelings of energy
- Improves mental and physical performance
- Prevents the negative effects of stress and enhances the body's response to stress

According to tradition and scientific evidence, the above-mentioned botanicals all possess this kind of equilibrating, tonic, antistress action, and so the term adaptogen is quite appropriate in describing their general effects. In particular, the research on Sensoril deserves special mention.

Sensoril

Sensoril is a patented proprietary extract of roots and leaves from *Withania somnifera*, a plant known as Ashwagandha in Ayurvedic

medicine and also referred to as the Ayurvedic adaptogen. Developed by researcher Dr. S. Ghosal, Sensoril was the result of intense scientific investigations into the anti-stress action of various compounds in *Withania somnifera*. Sensoril is standardized to contain the proper amounts of the compounds glycowithanolides, Withaferin-A, and oligosaccharides that research has shown to promote optimal anti-stress activity.

Sensoril is derived from the freshly-harvested roots and leaves of specially-cultivated *Withania somnifera* obtained from Northern regions of India. The roots used in Sensoril are from plants not more than two years old; roots from older plants, which are generally used in many commercially-available extracts of Ashwagandha, may contain very little, if any, glycowithanolides (the known anti-stress actives).

Sensoril appears to work on central mechanisms to restore HPA balance. A double-blind study of 98 chronically-stressed subjects showed that those taking Sensoril had significant reductions in a modified Hamilton anxiety (mHAM-A), serum cortisol, serum C-reactive protein, pulse rate and blood pressure, and significant increases of serum DHEAS and hemoglobin compared to the placebo group. In addition, there were dose-dependent responses in lowering fasting blood glucose and improving the serum lipid levels.¹⁴

Lavender Extract

Lavender has long been used by herbalists as a treatment for anxiety, nervous exhaustion, and depression. Recently, this historical use has been verified in a detailed double-blind clinical trial.¹⁵ The findings of the study indicated that taking a moderate amount of lavender can reduce feelings of depression, anxiety, and helplessness. In the study, 45 adults between the ages of 18 and 54 diagnosed with depression were assigned to one of three groups. The groups received either (1) lavender extract plus a placebo tablet, (2) a placebo extract plus 100 mg per day of the antidepressant drug imipramine, or (3) lavender extract and 100 mg per day of imipramine. The study lasted for four weeks and scores from the Hamilton Rating Scale for Depression (HAM-D)—a questionnaire used to evaluate the severity of depression (higher scores suggest more severe depression)—were evaluated initially and then weekly after the start of treatment. The results showed that the lavender extract was just as effective as the drug, but lavender did not produce the side effects common to drug treatment for depression (dry mouth, weight loss or weight gain, low blood pressure, arrhythmias, and decreased sexual function).

Effective Stress Management: Putting it All Together

The individual pieces of the stress management techniques discussed above can be tailored according to the patient's need to provide a more personalized program. For simplicity, here are four different levels of support.

Level 1 Support

Simply following the appropriate lifestyle and dietary approaches to stress reduction as well as regular utilization of techniques to calm the mind and body, and taking a high-potency multiple vitamin and mineral formula may be sufficient for some patients to effectively fight stress.

Level 2 Support

Level 2 Support involves using Level 1 Support and the use of strategies and supplements to improve sleep quality (see the *Insomnia and Sleep/Wake Cycle Disorder Clinical Highlight* for more information).

Level 3 Support

In the more stressed or anxious individual, GABA-Pro™ (contains PharmaGABA) or Calm-Pro™ (contains Suntheanine) can help with

situational stress as well as more pervasive feelings of stress and nervousness.

Level 4 Support

For patients who are starting to experience or are experiencing significant signs of adrenal fatigue and generalized exhaustion, Level 4 Support is recommended. This level involves using all of the previous levels of support along with taking Sereni-Pro™. This formula makes it easier to take advantage of the full spectrum of botanical support for dealing with stress. *Each two capsules contain:*

Sensoril® Ashwagandha (<i>Withania somnifera</i>).....	250 mg
(minimum 8% Withanolides)	
Eleuthero Extract (<i>Eleutherococcus senticosus</i>)	150 mg
(0.8% Eleutherosides)	
Lavender Extract 5:1 (<i>Lavandula angustifolia</i>).....	150 mg
Rhodiola Extract (<i>Rhodiola rosea</i>).....	75 mg
(5% Rosavins and 1% Salidroside)	

While GABA-Pro™ or Calm-Pro™ is useful as a quick fix for stressful situations, Sereni-Pro™ is designed for long-term use to help build resistance and act as an adaptogen. The dosage of the formula is one or two capsules twice daily.

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FIGURES

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