ISAGENIXSCIENCE

De-Stress to Defy Aging

How chronic stress affects your body and ruins health

An essential part of keeping the body healthy and young is managing the onslaught of chronic stress in a modern world.

Everyone knows what it's like to feel "stressed" or "threatened." Stress sparks a cascade of physiological changes in the body. Breathing quickens and the heart pumps harder. Pupils dilate, hair stands on end, and sweat glands open. Senses sharpen and so does judgment because the brain knows that this is the moment when it's time to fight or to flee. Stress is a normal part of being human. However, its very existence is one of duality--as *savior* and *killer*.

Stress comes in two different packages: sudden stress (acute) and ongoing stress (chronic). Acute stressors are those perceptions of immediate threat or dangers. They bring the mental acuity, physical stamina, adrenaline, and the hormone cascade that prepares your body for "fight or flight." But chronic stress ensues when stress is a constant factor and it can take a heavy toll on our health.

Our understanding of stress and its effects on physiology, in fact, is relatively new. The condition itself was not even named until 1936. Hanz Selye was the first scientist to define *stress* as "the non-specific response of the body to any demand." Seventy-six years later, the physiology of the chronic stress response is well-studied, widely discussed, and thoroughly researched.

Suk's Letter

Everyone has stress, but few of us realize how it affects our physiology. Stress can *lead to increased visceral fat and insulin resistance*, *depress the immune system, cause sexual dysfunction*, and *shorten telomeres.* To defend against stress and protect our bodies, we need to manage it properly.

In this issue, we explore the scientific research on stress and how it affects our physiology. We'll also educate you on how to beat stress with science-backed methods of *regular exercise*, *meditation, proper nutrition,* and *supplementation with bioactives aptly called "adaptogens"* found in Isagenix Ionix Supreme.

Live well and adventurously!

- Suk Cho, Ph.D.

Chronic stress now plagues our modern society. Almost half of Americans suffer from stress-related health problems and an estimated 75 to 90 percent of all doctors' visits are related to stress, according to The Stress, Anxiety & Depression Resource Center. Stress is also linked to the six leading causes of death in the U.S. Nearly 40 percent of American workers report their job as "very or extremely stressful," according to the

Centers for Disease Control. Despite these statistics, most of us don't even realize that stress can affect our bodies on the inside.

Chronic stress is a true antagonist to our health and it comes from a variety of sources such as finances, relationships, and career. What is the result? It causes a deterioration of the mind as well as the body. Symptoms can manifest as exhaustion, anxiety, and depression.

Long-term chronic stress produces an ongoing hormonal response that causes premature aging, adversely affects brain chemistry, causes sexual dysfunction, compromises metabolism, brings down energy, stores fat (in all the wrong places), and ultimately can lead to the development of chronic disease and death.

As Dr. Selye would phrase it, stress is a generalized strain placed on the body. But today, most would agree that stress is generally negative. Just as people are seeking solutions for healthy weight loss, they are also seeking advice about how to manage the stress in their lives, how to decompress, and ultimately how to 'de-stress.' It is not just a goal, for many it has become a necessity, a matter of survival.

While small truths do reside in the newest exercise fads for reducing stress, as does time in meditation, books, or a few extra weeks of vacation—stress is not eliminated, but rather, managed every day.

With each daily challenge comes a new opportunity to find balance. The science behind Isagenix products is a great way to help you find that balance, and with it, your ideal health.

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BREAKING THE HPA AXIS-CORTISOL STRESS CYCLE

Much like a traffic cop regulates a busy intersection, inside our bodies the reaction to physical and mental stress is controlled by the hypothalamus interacting with the pituitary and adrenal glands. This hypothalamus-pituitary-adrenal (HPA) axis also helps regulate temperature, digestion, mood, sexuality, energy, and the immune system.

The location of the hypothalamus and pituitary gland are in the brain, while the adrenals sit on top of the kidneys. The hypothalamus is responsible for controlling hunger, fatigue, body temperature, and sleep. It also secretes hormones.

The hypothalamus and the pituitary gland work closely with each other, as the hormones secreted by the hypothalamus may cause or prevent secretion of pituitary hormones. The adrenal gland releases hormones that play a part in the stress response such as cortisol and adrenaline. The gland also oversees the functions of the kidneys.

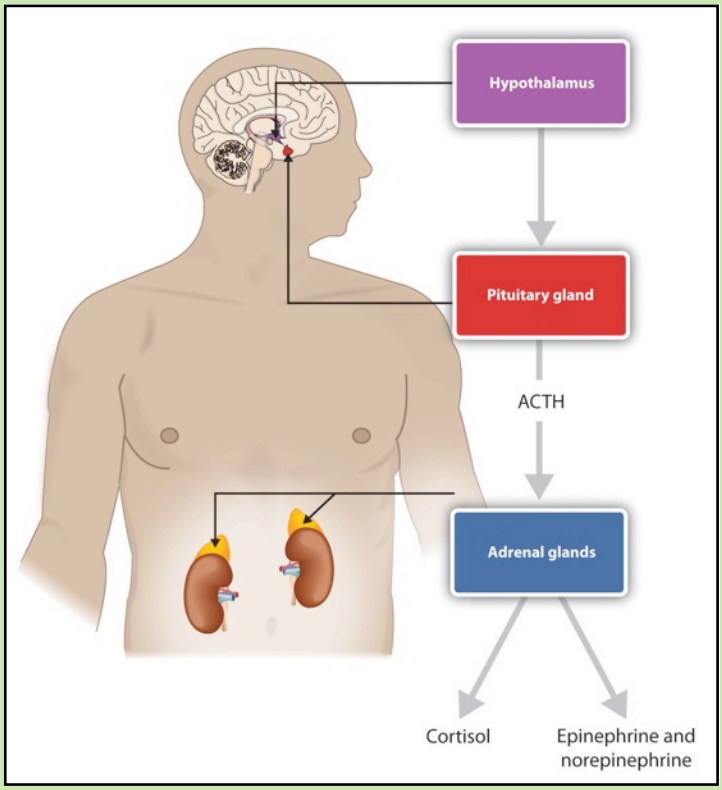
Though the HPA axis has many functions—many of which are enormously complex—its primary function is regulating the body's response to stress. The first stage of the stress response involves the hypothalamus releasing a hormone called corticotrophin-releasing factor (CRF). CRF then stimulates secretion of adrenocorticotropic hormone (ACTH) from the pituitary gland. Next, ACTH causes the adrenal gland to release *cortisol*, a stress hormone that does its job of ramping up the physical response to stress.

Cortisol

HPA axis dysfunction and increased plasma cortisol contribute to several health problems including weight gain. Of particular concern is its role in promoting the accumulation of visceral fat (intra-abdominal fat). Two cases of extreme plasma cortisol levels provide the link between HPA axis functioning and control of body weight. One is Addison's disease, which is when insufficient cortisol is produced and rapid weight loss occurs. The other is Cushing's syndrome, which is when too much cortisol is produced and rapid weight gain results.

To understand the stress-visceral obesity link, it helps to take a look at the factors involved in the body's stress response, and why these factors promote the unwanted "packing on" of pounds.

When faced with acute stress, and the "fight-or-flight" response kicks in, the result is appetite suppression. But exposure to chronic psychological stressors, like job or relationship pressures, where cortisol levels are elevated, the typical response for many people is the opposite of avoiding food—rather, their solution is to seek out and consume more calorie-rich foods.



Chronic stress leads to increased release of hormones linked to inflammation and visceral fat. Credit: New Charter University

This cortisol-craving effect is supported by a study published in the journal *Psychoneuroendocrinology* (1) that found women who were highly stressed reported more emotional eating and greater amounts of visceral fat. Another similar study reported that men and women who had more work stress also had a higher risk for obesity and, especially, visceral fat accumulation. The hormonal imbalance occurring with chronic stress and the surge of cortisol also contributes to greater release of insulin while simultaneously reducing the level of hormones (adiponectin and leptin) needed to regulate fat storage and appetite. Combined elevation of cortisol and insulin along with the decrease of adiponectin and leptin sets off the perfect storm favoring the storage and over-accumulation of visceral fat.

Eventually, once the elevated levels of cortisol, insulin, and abdominal fat are firmly in place, it's but a matter of time before insulin resistance, inflammation, cellular aging, and other pathologies set in. Science has still a distance to go before fully grasping what goes on in the body when chronic stress and visceral fat accumulation happen in concert, but for now, the best advice is to keep both of these risk factors to a minimum.

Exercise, Meditation, and Adaptogens

With the knowledge that stress can have serious negative effects on the body, the question to raise then becomes, *How do we protect ourselves from chronic stress*? There is no way to entirely avoid chronic stress in our lives. The answer lies in learning how to manage stress so that our long-term health isn't threatened. And for this, science offers good suggestions as to what kinds of behaviors the HPA axis responds to.

Physical activity is already well-known for its benefits to the body and for mental health. Engaging in regular exercise positively affects the activity of the HPA axis and levels of cortisol. A 2010 study (2) published in *Biological Psychology* reported that when comparing younger and older ballroom dancers to less physically active controls, the dancers had both lower HPA activity and cortisol levels. The dancers' lower cortisol levels were surprising because regular

training and dance competitions could be regarded as highly stressful events. An earlier study (3) found similar results in women—those who were the most physically fit had reduced cortisol responses to mental stress in comparison to women who were unfit.

In addition to having an effect on the stress response, exercise was even found to buffer the effects of stress on telomere length. A 2010 study (4) conducted in part by Elizabeth Blackburn, one of the Nobel Prize winners for her work in telomeres, reported that in women who perceived themselves to be stressed, those who were physically fit had longer telomeres compared to women who were less fit.

Meditation is also a nice complement to exercise in buffering the ill-effects of stress. A just-released study (4) from the journal *Neuropsychobiology* evaluated cortisol levels and sleeping habits of long-time meditators, or those trained in *mindfulness*, to people who had never before meditated. Initially, the researchers found that the long-term meditators already had lower measurable cortisol. But after the eight weeks of meditation, even beginners to the practice had improved cortisol levels. Also, in both long-term and novice meditators, higher levels of cortisol were found in those who reported poor sleep habits.

Lastly, and one of the most exciting areas of research into guarding against the effects of stress, is supplementation with unique bioactive substances called *adaptogens*. Studies have shown that adpatogens can act like "stress vaccines" reducing feelings of stress while decreasing circulating cortisol. For more on adaptogens, see the next article below entitled "Beat Stress at Its Own Game With Adaptogens".

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BEAT STRESS AT ITS OWN GAME WITH ADAPTOGENS

In 1947, former Soviet Union research scientists Nicolai Lazarev and Israel Brekhman devised the word *adaptogen*. From the Greek word *adapto*, meaning "to adjust," the term was used to describe protective agents that helped neutralize the effects of stress.

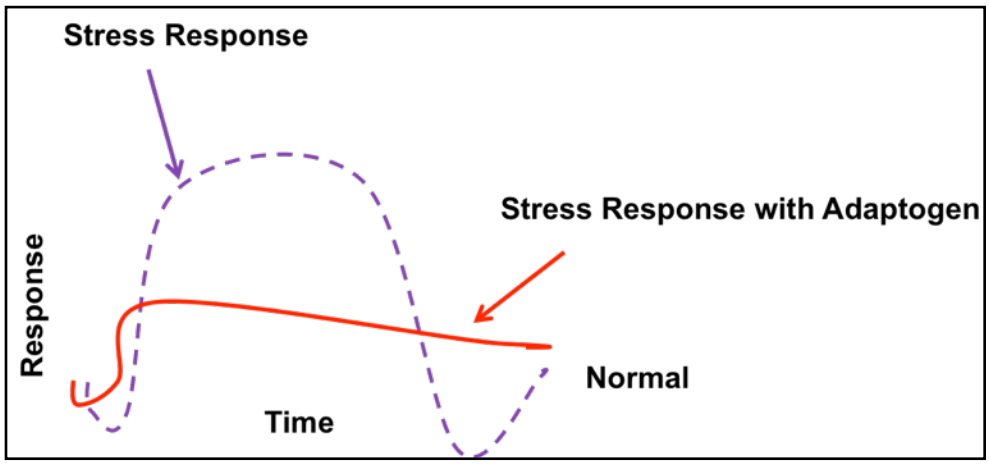
The researchers drew inspiration from ancient Chinese and Siberian traditions whose followers made use of special herbs before a hunt or battle. Lazaref and Brekhman studied the herbs used in these traditions, some of which they classified as stimulants because they were harmful after prolonged use. The adaptogens, according to their criteria, normalized the body and increased resistance to stress without any noxious effects.

Attention to adaptogens in North America first came about in 1990 after former Soviet Union Olympic Coach Ben Tabachnik emigrated to the U.S. and revealed that Soviet athletes and cosmonauts had covertly used adaptogenic herbs throughout the 1970s.

It was out of the initial research of these scientists that Ionix Supreme was born. The research into adaptogens grows and several of the ingredients have been subject to clinical trials attesting to their effectiveness.

Deemed "nature's answer to stress," Ionix Supreme is a cocktail of adaptogens designed to work in synergy to protect the body against the harmful effects of stress.

Several adaptogenic botanicals protect against stress perhaps through a variety of mechanisms. Ashwagandha (*Withania somnifera),* for example, a short shrub also known as Indian ginseng, has been used for centuries in Asia to treat stress-related health conditions. In 2008, a randomized, double-blind, placebo-controlled study (1) evaluated its use in adult men and women with high amounts of stress. After 60 days of treatment, those who received the adaptogen had reduced feelings of stress. In addition, they showed a reduction in circulating cortisol. The researchers attributed ashwagandha's stress-reducing abilities at least in part to its effect on the hypothalamic-pituitary-adrenal (HPA) axis, a primary regulator of serum cortisol levels.



Adaptogens increase the state of resistance in stress and decrease sensitivity to noxious stressors, resulting in stress "protection" and prolonging the phase of resistance. Ref: Panossian & Wikman 2010.

Ionix Supreme also contains rhodiola (*Rhodiola rose*a), schizandra berry (*Schisandra chinensis*), and eleuthero root (*Eleutherococcus senticosus*). These extensively studied adaptogens may similarly work by mimicking stress itself, according to Swedish researchers Alexander Panossian and George Wikman. Acting alike "stress vaccines," they create an adaptive response in the nervous, cardiovascular, endocrine, immune and gastrointestinal systems. According to their recently published scientific review on adaptogens (2), the reason these herbs are effective may be because they stimulate biochemical pathways that help reduce the harmful effects of stress on the body.

The adaptogens work by increasing the work capacity of the body or brain by being "stress-protective" or "restorative." This makes them different from stimulants like, say, caffeine, which works by "tricking" the brain to make it more alert, but depleting its energy and resources. Fortunately, what adaptogens won't do is impair mental function or cause addiction. After Panossian and Wikman examined randomized, clinical trials on rhodiola, schizandra berry, and eleuthero root, they found that these and other adaptogens not only reduce stress and fatigue, but improve attention and focus.

Panossian and Wikman also suggest (3) in a second review that these adaptogens might normalize homeostasis (balance in the body) through several mechanisms akin to mild stress hormones. This reasoning is based on the similar chemical structure of the active components of the herbs to catecholamines--such as adrenaline--which are important regulators of stress. Components of the herbs may also resemble corticosteroids, which help to inactivate a stress response.

Additional botanical herbs in Ionix Supreme include wolfberry (*Lycium barbarum)* and bacopa (*Bacopa monnieri)*. These herbs increase resistance against psychological stress (4-11). And, along with ashwagandha, they operate as antioxidants in the body and may even protect the brain from oxidative stress (4-11). By improving brain health, these herbs could help support normal working memory, mental clarity, and focus.

Strong evidence suggests that management of psychological stress and minimizing its effects with exercise, meditation, and adaptogens may support more graceful aging. The link between chronic psychological stress and age-related disease is already

well established. Chronic stress, for example, is directly associated with shorter telomeres, those protective caps on chromosomes whose length is considered a biomarker of aging (12).

With the herbal ingredients acting synergistically, drinking a daily shot or two of Ionix Supreme offers consumers a delicious and convenient way of obtaining stress-protecting adaptogens.

In today's modern society, most people do little to protect themselves against the onslaught of chronic stress in their lives. A healthy diet, meditation, and exercise are essential for managing chronic stress. Ionix Supreme, as an adaptogen-rich drink, can be just what's needed to best support memory, focus, attention, athletic performance, and healthy aging.

Why Adaptogens Work

- May act as "stress vaccines," inactivating a stress response
- Guarding against stress-hormones such as cortisol
- Improving mental and physical performance through increasing resistance to stress by the body and brain

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HOW TO STOP WORRYING AND START LIVING LONGER

Daily worries like stage fright may speed up telomere shortening, a new study suggests.

"Put a 'stop-loss' order on your worries. Decide just how much anxiety a thing may be worth—and refuse to give it any more."

This timeless advice given from Dale Carnegie is not just good for your peace of mind; new research suggests it could help you age gracefully.

Previously, researchers at the University of California at San Francisco discovered that too much daily stress could speed up the aging of telomeres, those protective caps on chromosomes. Now, these same investigators have dug deeper into how *anticipation* of stress—in other words, worry, panic, or anxiety—affects telomeres in women.The researchers, led by Nobel laureate molecular biologist Elizabeth Blackburn, Ph.D.,* and psychologist Elissa Epel, Ph.D., found that women who responded to a "stressor" such as public speaking or solving a math problem with higher levels of perceived threat had significantly shorter telomeres in their white blood cells (leukocytes) in comparison to women who anticipated less of a perceived threat.

The study, to be published in the May issue of the journal *Brain, Behavior, and Immunity*, evaluated telomere length and anticipation of stressful situations in 50 women, about half of whom suffered from chronic stress as caretakers for relatives with dementia. The results suggest that women serving as caregivers felt more threat than the non-caregivers when asked to perform public speaking and solve math problems.

The study suggests people who are exposed to chronic stress are more likely to see small stressors as more threatening, such as losing keys, leading a meeting at work, or getting stuck in traffic. In addition, their greater perceived threat to constant stress can increase their risk for shorter telomeres.

"Psychological stress exposure leads to exaggerated threat sensitivity, which drives more frequent and prolonged threat perception in daily life, which in turn promotes activation of the biological stress responses that can drive telomere shortening," the researchers wrote.

The scientists hypothesize that a better understanding of how stress promotes biological aging, or telomere shortening, could lead to improved stress management. This improvement would be particularly beneficial to reduce the compounding effects of perceived stress.

A few tried-and true stress reduction techniques include meditation, exercise, getting adequate sleep, and supplementation with adaptogens.

These can also be complemented by healthy diet and lifestyle behaviors that provide the greatest support for telomeres.

To age gracefully without worry, however, the best advice may be from Carnegie: "If you have a worry problem, do these three things:

1. *Ask yourself: 'What is the worst that can possibly happen?'*
2. *Prepare to accept it if you have to.*
3. *Then calmly proceed to improve on the worst."*

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**Dr. Blackburn and her colleagues Carol Greider, Ph.D., and Jack Szostak, Ph.D., received the 2009 Nobel Prize in Physiology or Medicine for "the discovery of how chromosomes are protected by telomeres and the enzyme telomerase."*

LACK OF SLEEP LINKED TO OVEREATING

Lack of quality sleep is linked to high cortisol and binge eating.

What's a sure way to boost stress hormones like cortisol and gain weight? Poor quality sleep.

Researchers from the University of North Carolina suggest that women lacking restful sleep are more likely to report binge eating, irrespective of weight, age, current relationship status, and depression.

Published in the *International Journal of Eating Disorders*, this analysis looked at the prevalence of binge eating behavior in 3,790 women. Answering online questionnaires, participants reported weight, height, history of depression, marital status, age, quality of sleep, and eating behaviors. Men were excluded from the study due to a low response rate. Of the women polled, 244 were found to have a history of binge eating.

The authors also pointed out that obese women were more likely than non-obese women to report binge eating, as well as disturbed sleep patterns. However, the association between obesity and sleep was only apparent in those women who also suffered from depression.

The reasons behind sleep and uncontrolled appetite are still under debate. However, the most compelling hypothesis, according to the authors, is that there are shared hormonal and metabolic pathways between sleep and appetite.

The authors explain that the hormones leptin and ghrelin are key to appetite and body weight regulation. Leptin decreases appetite, while ghrelin stimulates appetite and slows metabolism. To the detriment of the waistline, the authors propose that sleep may cause these hormones to become imbalanced.

Another hormone that may be influenced by inadequate sleep is cortisol. Cortisol is a "fight or flight" hormone known to increase in the bloodstream during times of stress. While cortisol may be the molecule that gets you out of bed in the morning, if it is poorly managed it can affect your energy metabolism and fat storage, particularly intra-abdominal fat.

"Insufficient sleep may result in increased cortisol levels," the researchers wrote.

They further explain that cortisol may reduce the effects of leptin and instead support the activity of ghrelin. In other words, this imbalance in hormone release may stimulate a hearty appetite with little metabolism to burn up the calories.

As much as a quarter of U.S. adults battling obesity have reported a history of binge eating. Binge eating is viewed as a loss of control that results in large intakes of food during short periods of time.

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The average amount of time that Americans sleep dropped by nearly 2 hours per night between 1998 and 2000—this was accompanied by an 8 percent rise in rates of obesity.

Numerous studies have documented a potential link between BMI, obesity, and sleep problems; however, little research has been published examining the relationship between sleep and binge eating. This study highlights the impacts of poor sleeping on the current obesity epidemic, but also offers insight for those who are trying to lose weight yet don't get adequate sleep.

Maintaining weight is a constant but worthy fight. Getting more sleep will not only improve quality of life, but might also tip the scales for dietary control in your favor.

Reference

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