

Understanding Stress, Chronic Stress, and Adrenal Fatigue

Stress is nothing new; it has been with us since time began. In its most basic incarnation, we are stressed when we are threatened and faced with fight or flight. In modern times, we need stress to focus our mind and to sharpen our wits. Stress helped to give us the edge we needed to survive. Large amounts of stress hormones (like cortisol and adrenaline) can enable us to do amazing things, feats beyond what we could do under any other circumstances.

Contents

- **Rising to the Occasion**
- **Side-Effects of Chronic Stress**
- **Stress Hormones Defined**
- **Positive Aspects of Stress**
- **It's All In Our Heads**
- **It's Good to be King**
- **The Fine Line Between Stimulating and Stressful**
- **Ease The Pain**
- **Apathy**
- **Release the Pressure and Handle Stress Better**

- **Symptoms of Adrenal Fatigue**
- **Natural Remedies for Adrenal Fatigue and Chronic Stress**
- **Candida and Adrenal Fatigue**
- **Grounding for Adrenal Fatigue**
- **Fitness for Adrenal Fatigue**
- **Conclusion**

Under the rush of life or death circumstances, our perception of time slows down. We become hyper-focused upon our goals, blocking out all other distractions. Relevant sounds become more prominent, irrelevant noise less so. Reflexes sharpen, and our reaction time improves. Pain is diminished, and we gain strength beyond measure. In those times, the world snaps into focus, and in the rush of the moment, we can reach beyond human limitations.

When it's life or death, we can do amazing things. There is a lot to be learned about how this process takes place in our bodies, and science has not yet teased apart all the steps of this complex phenomena. Ethical restraints prevent scientists from recreating life or death circumstances for study. But throughout the years, many people have been witness to extraordinary acts by those in the heat of the moment.

Rising to the Occasion

It was the primal response to danger that enabled Tom Boyle Jr. to do what would otherwise have been impossible. Sitting in traffic, Tom and his wife witnessed a gruesome spectacle. Sparks sprayed from beneath a car ahead of them as it drug 18-

year-old Kyle Holtrust and his bicycle, his flesh being torn open along the road. After 20 to 30 feet, the driver finally came to a stop, and Tom Boyle leapt into action.

The bicyclist was pinned beneath the frame of his bike and a 3,000 lb. Camaro. Kyle screamed in agony, pounding the side of the car with his free hand. In that moment, Boyle reached under the frame of the 3,000 lb. car and lifted it off of Kyle. The driver of the car then pulled Kyle to safety. After an amazing 45 seconds of holding the car, Boyle set it back down. Boyle doesn't deny that it was the extreme stress of the moment that made the difference "There's no way I could lift that car right now."

When it's life or death, we can do amazing things. Other stories similar to this one are easy to find. A Canadian mother, Maureen Lee, used only her bare hands to throw a cougar off of her 3 yr. old daughter. Understandably, the cougar was terrified of her hysterical strength and ran away.

Angela Cavallo lifted a 1964 Chevrolet Impala off of her son after it fell off of the jacks and onto him. Angela held the car long enough for others to arrive and to put the car back onto the jacks. Lydia Angyiou attacked a polar bear that was threatening her son and another boy. While the boys ran for help, Lydia managed to engage the bear in physical combat long enough for help to arrive. Help came in the form of a neighbor armed with a gun. He shot the bear four times, ending the fight. Surprisingly, Lydia's wounds were minor. This is the kind of stress that we are biochemically equipped to handle.

Unfortunately chronic stress can lead to all kinds of poor health outcomes

Life is expected to be stressful, and we are designed to rise to the occasion. But we are designed for extreme stress. In today's modern world, extreme stress rarely happens. The kind of stressors that we encounter today are usually more of the low-level, ongoing variety like relationship troubles,

financial difficulties, and abrasive bosses. Our bodies are not well equipped to handle long term, chronic stress. Ongoing stress can bring on a multitude of diseases and send us to an early grave.

It's true; stress can kill you. The Japanese call this Karoshi, which means death from overwork. But it is the stress from work that kills us, not the work itself. That is, the stress and lack of sleep from overwork, which further adds to our stress.

Stomach ulcers were the first disease linked to chronic stress. It took many more years of research to learn that many diseases are linked to chronic stress.

The old saying, "Whatever doesn't kill us, makes us stronger," may not hold true when it comes to chronic stress.

Health Problems With Excessive Stress Hormones

- Acne
- Addictions
- Anxiety
- Alzheimer's
- Bone Loss
- Cancer (due to reduced immune system)
- Depression
- Diabetes
- Digestive problems
- Heart disease (stress actually creates plaque in the arteries)
- Infertility
- Inflammation
- Impaired immunity
- Insulin resistance
- Hypertension (high blood pressure)

- Hyperglycemia (high blood sugar)
- Metabolic syndrome
- Memory and concentration impairment
- Osteoporosis
- Reduced libido
- Senile dementia
- Sexual Dysfunction
- Stomach Ulcers
- Strokes
- Weight gain (stress encourages fat to be retained in the body, especially around the abdomen)

Unfortunately chronic stress can lead to all kinds of poor health outcomes, not just the problems listed above.

More Side-Effects of Chronic Stress

Mice subjected to chronic stress had smaller brains, fewer connections formed in their brains, and fewer brain cells. The areas of the brain associated with learning and memory were particularly affected.

Chronic stress kills human brain cells as well, and it has also been shown to lower I.Q. When we are stressed, our ability to use our higher-level thinking (our frontal lobes) is disrupted, as well as our ability to access memories.

Chronic stress may shorten telomeres. Telomeres are at the ends of our DNA strands. Every time a cell divides, telomeres are slightly shortened by the cell's division. So by further shortening our telomeres, chronic stress can shorten your lifespan and make you age faster. Centenarians tend to possess two common traits: long telomeres and a low-stress approach to life.

Scientific understanding of the stress response has improved a great deal in recent years, but there is still a lot science does not yet fully understand. Physiological changes brought

on by stress are very complex. What we do know is that when we are stressed our body releases adrenaline, endorphins, fibrinogen, norepinephrine, corticotrophin, cortisol, and vasopressin, and we have a working knowledge of the changes in the body that are brought on by these substances.

Stress Hormones Defined

Adrenaline is also known as the fight or flight hormone. Adrenaline gives you an instant surge of energy, and it focuses your attention to immediate threats. Adrenaline directs blood flow to our arms and legs. Heart rate and respiration quicken, and we may start sweating. Adrenaline is released from the adrenal glands after the brain sends a warning of imminent danger.

Corticotrophin's primary function is to drive the release of other stress hormones. Corticotrophin also suppresses appetite, improves memory (even as other stress hormones dampen memory), increases overall anxiety, and it focuses attention. Corticotrophin also plays an important role in inflammation. Corticotrophin is produced in small quantities by white blood cells and in larger quantities by the hypothalamus.

Endorphins are released in times of stress to act as a natural painkiller. Many people report not feeling any pain from injuries until after the threat to life or limb has passed. By numbing our sense of pain, we are able to push ourselves further than we otherwise could, straining muscles and pushing past injuries to do what is needed.

Fibrinogen is a protein that aids in blood clotting, providing some protection against excessive bleeding. Fibrinogen is also why high levels of stress forms plaque on the arteries.

When your boss tells you that his or her job is more stressful than yours they're probably lying...

Norepinephrine is a hormone that is very similar to adrenaline. It makes you very alert, more responsive and invigorated. It also diverts blood from the skin, the digestive tract, and other non-essential areas, shifting more blood to your muscles. This can further aid in any fighting or fleeing that you may need to do. The adrenal glands and the brain produce norepinephrine.

Although norepinephrine might seem redundant considering that adrenaline (which is also called epinephrine) mirrors its effects; it actually works as a back up and as a compliment to adrenaline. If your adrenal glands are not working well, you can still get a solid dose of norepinephrine from your brain.

Vasopressin is also known as the antidiuretic hormone or arginine vasopressin. This hormone causes reabsorption of water by the kidneys, which concentrates our urine. This is why we are less likely to think about trips to the bathroom in highly stressful situations. It also induces something called vasoconstriction, which is the constriction of blood vessels. This raises our blood pressure. Vasopressin is produced by the hypothalamus, then stored and later secreted by the pituitary gland.

Cortisol has been nicknamed the "stress hormone." It is, in fact, not **the** stress hormone, but one of many. Cortisol does a lot of good things for us. It aids in metabolism and many other bodily functions. Under stressful situations, cortisol takes a little longer than the other stress hormones to kick in. It is meant to provide us with sustained energy over a longer period of time.

Stress hormones are some of the heavy lifters that helped Tom Boyle leverage the Camaro off of Kyle. This ability to respond to extreme circumstances with extreme measures is undoubtedly one of the upsides of having stress hormones. There are other benefits to stress hormones as well.

Positive Aspects of Stress

“He that wrestles with us strengthens our nerves and sharpens our skill. Our antagonist is our helper.” – Edmund Burke

Stress can make you feel alive. It is this rush of stress hormones that give us that thrill when we are watching action movies or horror movies. Our bodies release stress hormones when we are watching sports and when we are playing games like paintball, laser tag, and video games. Some amount of stress is good, healthy, and invigorating. It can make us feel more “in the moment”.

Another upside to stress is its ability to act as an effective motivator. Ever heard that old adage, “I work best under pressure”? The right amount of stress sharpens our focus. The right amount of stress coupled with an optimistic outlook hones athletic performance. Under the right circumstances, stress can be our ally.

The difference between good stress and bad stress is mostly how we perceive the circumstances. The majority of people think of stress as something that happens to them, from external factors, like one too many straws that broke the camel’s back. This idea of one too many is often extended to those in mental institutions and prisons, as we ask, “What was the last thing that made those people snap?”

The idea of too much, too many, is a good model for physical stress. Bridges, houses, and buildings are all built to withstand a certain amount of physical stress. When subjected to too much stress at once or too much stress over an extended period of time, the structures collapse.

It’s All In Our Heads

Emotional stress doesn’t need to affect the body in the same way. All of our stress passes through our minds before it goes

on to affect our bodies. Our thinking about stress either magnifies our stress or dampens it. Many of us think of our jobs as stressful, our boss as stressful, or traffic as stressful. Although some occupations are more stressful than others, we can mitigate the intensity of our stress by changing the way we think about it. Being stuck in traffic isn't fun either, but we can all take a deep breath and listen to enjoyable music instead of obsessing about how much time we're wasting looking at the sea of brake lights ahead. It is the way we react to these situations, the way we think about them, that makes them so stressful.

Many people thrive under stress, while others do not. Usually the difference is in perception, but it also helps when events are seen as being somewhat under their control. For many, powerlessness amplifies stress exponentially.

It's Good to be King

Where you are in your corporate hierarchy also matters a great deal. When your boss tells you that his or her job is more stressful than yours they're probably lying – if not to you, then at least to themselves. Numerous studies have shown that stress is lower at the top of corporate structures, not the other way around. The higher rank someone is, the less stress they endure and the longer they live. Rank does indeed have its privileges.

The Fine Line Between Stimulating and Stressful

Those who do well under stress also do not wallow in negative events. As an example, lawyers and doctors have stressful occupations. The difference between a lawyer or a physician coping well with their stressful careers lies in part with their ability to leave their job at work and not take the

stress home with them. To those who thrive in stressful jobs, their jobs are rarely all that stressful-because they don't perceive them to be that way. To them their job is challenging.

The right kind of stress is stimulation. The good kind is that thrill we get from a rollercoaster ride, the rush we get from a good horror movie, or the exhilaration we get from watching a sports game. Even in these examples, the way we perceive the stress is key.

Take sports for instance. It's possible to become too emotionally involved in sports, even as a spectator. Sports fans have a way of feeling both the triumphs and failures of their favorite teams. Taken too far, this can be unhealthy.

In one study, researchers tracked the health outcomes of soccer fans. The Dutch fans of the European Cup Soccer game were devastated by their teams' loss. The Dutch fans risk of heart attack increased by 50% shortly following the game.

So stress can take a lot out of us. Evolved out of dire necessity stress hormones divert energy away from reproduction, tissue repair, digestion, anything non-critical. Our bodies' design is to worry about these things later, if there is a later. This can allow us to do incredible things, when life or death is at stake.

Ease The Pain

When stress is ongoing, it hurts our health and it takes away from our quality of life. Looking for a way to cope, many people try to self medicate when they are chronically stressed. Drug use and alcohol abuse are commonly used to cope with stress. We recommend turning to vitamins or supplements instead. A good B complex vitamin, tryptophan, and supplements for the adrenal glands are very effective without such harmful side effects. See *Natural Remedies for Adrenal Fatigue* below.

There are other adaptive ways to foster resilience. Caring and compassion create resistance to stress. Connecting with others and sharing a laugh are powerful ways to mitigate the harmful affects of stress.

Oxytocin is the body's natural antidote to stress. Known as the cuddle hormone, it has anti-inflammatory properties and promotes healing, especially for cardiovascular damage.

Positive emotions also spur on the enzyme telomerase, an enzyme that can actually repair telomeres.

Apathy

Some amount of stress is actually good for us, and without some stress, boredom sets in. The key to coping with stress is to see hardships as challenges. If you can view some stress as helpful, it mimics the biological changes induced by joy and courage. The trick is to change your perception of stress from a negative thing to a positive motivator.

My favorite analogy about stress being helpful comes from Dr. Mike Evans. He describes optimal stress as keeping stress high but not too high. Perceive current events as relevant, but not overwhelming and manage it like a bicycle tire. Give it enough pressure to keep rolling, but not so much it explodes if you hit a bump in the road.

Release the Pressure and Handle Stress Better

When you feel close to that breaking point, there are a number of techniques you can use to bring the pressure back down to optimal levels. These include some of the old standbys like deep breathing, exercise, humor, meditation, spending time in natural surroundings, and sharing your troubles with your friends.

Symptoms of Adrenal Fatigue

Chronic stress, stress managed poorly, poor sleep quality, and addictions lead to adrenal fatigue. When dealing with chronic stress, the adrenals are being severely taxed.

Adrenal fatigue is a collection of symptoms, known as a syndrome, that results when the adrenal glands function below the necessary level. Most commonly associated with intense or prolonged stress, it can also arise during or after acute or chronic infections, especially respiratory infections such as influenza, bronchitis or pneumonia. As the name suggests, its paramount symptom is fatigue that is not relieved by sleep, but it is not a readily identifiable entity like measles or a growth on the end of your finger. You may look and act relatively normal with adrenal fatigue and may not have any obvious signs of physical illness, yet you live with a general sense of unwellness, tiredness or “gray” feelings. People experiencing adrenal fatigue often have to use coffee, colas and other stimulants to get going in the morning and to prop themselves up during the day.” – What is Adrenal Fatigue?

Life is much harder when someone suffers from adrenal fatigue. When the adrenals aren't working, the whole body isn't working. The body does its best to make up for under-functioning adrenal glands, but it does so at a price.

Symptoms include:

- ADHD
- Anxiety
- Balding lower legs
- Body fat accumulation
- Brainfog
- Breast cancer
- Chemical sensitivities to paint, fingernail polish,

plastics

- Chronic fatigue syndrome
- Coffee, tea, or energy drinks addiction
- Cold hands and feet
- Constipation
- Cravings for salty or sugary foods, alcohol, caffeine, high protein
- Dark circles under eyes that does not go away with rest
- Dependence on sunglasses
- Depression
- Dry skin
- Dysmenorrhea advancing to amenorrhea
- Electrolyte imbalance
- EMF sensitivity, including cell phone and computer monitors
- Endometriosis
- Exercise helps first, but then feels worse
- Feeling “wired” and unable to relax
- Feeling of adrenaline rushes in the body
- Feeling tired in the afternoon between 3:00 and 5:00 pm
- Fibrocystic breast disease
- Fibromyalgia
- Grave’s disease
- Hair falling, randomly or alopecia
- Hashimoto’s thyroiditis
- Heart palpitations
- High or low blood pressure
- Hollow cheeks
- Hormonal moodiness, bad PMS
- Hyper activity
- Hypoglycemia symptoms, though lab results normal
- Inability to handle stress
- Inability to take in simple carbohydrate
- Insomnia
- Irritable bowel syndrome, with more constipation than diarrhea
- Irritable under stress

- Joint pain
- Kidney health issues
- Legs that feel heavy
- Lines in fingernails
- Lines in fingertips
- Loss of healthy facial skin tone color
- Low back pain
- Low energy
- Low libido
- Low thyroid function, hypothyroidism
- Muscle mass loss
- Muscle pain
- Numbness and tingling in extremities bilaterally
- Ovarian cysts
- Pale lips
- Panic attacks
- Polycystic ovarian syndrome
- Poor emotional and coping ability
- Post partum fatigue and depression
- Premature aging skin
- Premature menopause
- Psoriasis
- Recurrent miscarriages during first trimester
- Short of breath
- Systemic Candida
- Temperature intolerance
- Tinnitus (chorionic ringing in the ear)
- Unable to get pregnant
- Unexplained back or knee pain
- Uterine fibroids
- Vertigo
- Wake up in the middle of the night
- Weak immune response

Natural Remedies for Adrenal Fatigue and Chronic Stress

Adrenal fatigue can be treated naturally with herbs and supplements, but diet and good habits have to be in place. Bad habits need to be removed (caffeine, alcohol, smoking anything). The gut and thyroid need to be healed as well.

The following herbs are used to treat adrenal fatigue:

- Licorice
- Rhodiola
- Shisandra
- Holy Basil
- Ashwagandha root
- Astragalus
- Ginseng Root

The following vitamins and supplements are helpful in treating adrenal fatigue:

- B-complex – especially B5
- Vitamin C
- Adrenal extracts

Candida and Adrenal Fatigue

Candida is the number one cause of poor health in our country. An overabundance of Candida will eventually cause adrenal fatigue (along with many other problems). If you're experiencing adrenal fatigue, cut out stimulants completely. No more coffee. Clean the intestines.

Grounding for Adrenal Fatigue

Get outside and get grounded. Learn how to breathe! And take up yoga or meditation, preferably outside and barefoot.

Fitness for Adrenal Fatigue

Don't push yourself too hard, but do exercise. Exercise is good for the thyroid and the adrenals. Any exercise from yoga to high intensity interval training (HIIT) will help you normalize your energy levels. But be careful with intensive training. If you have severe thyroid or adrenal problems, intense exercise could be dangerous. Once your body and your adrenals are responding to detoxification and proper nutrition, HIIT can radically accelerate the thyroid and adrenals' improvement.

For long-term health, mix it up and add variety to your exercise routine.

Conclusion

The greatest weapon against stress is our ability to choose one thought over another" – Dr. William James

If you feel that your life is stressful, and there's no avoiding stress, you're right. Stress is unavoidable. Life has a way of giving us ups and downs, and worse still, life has a way of kicking us when we're down. We've all been there – when things couldn't possibly get worse and then they do.

We all have choices to make. How are you going to take care of your body? Will you eat the healthiest diet possible? Will you exercise? Will you get enough sleep? How are you going to react to life's inevitable setbacks?

These choices are actually life and death choices. This may sound melodramatic, but it is true. Poor nutrition, lack of sleep, little to no exercise and giving in to negative emotions will send us to an early grave. We have a choice in the way we live life, and our choices become our reality.

Recommended Supplements:

- Total Nutrition Formula
- Adrenal Cortex – Thorne Research
- Stress B Complex – Thorne-Research
- Shillington's Female Energy Formula
- Shillington's Male Formula
- Thyrocsin_Thyroid Support – Thorne Research

Further Reading:

- *Natural Remedies for Adrenal Fatigue*
- *Understand Hypothyroidism – Prevention and Natural Remedies*
- *Mental Health, Physical Health & B Vitamins – Nature's Valium*
- *10 Things You Can Do To Have More Energy*
- *Is Coffee Healthy?*
- *How to Kill Candida and Balance the Your Inner Ecosystem*
- *Earthing, Grounding*
- *How to Breathe*
- *Yoga – A Beginner's Guide*
- *Make Your Immune System Bulletproof with These Natural-Remedies*

Sources:

- *Can Stress Actually Kill You? – ASAP Science*
- *Kelly McGonigal: How To Make Stress Your Friend – Ted Talks*
- *The Science of Stress – National Geographic*
- *Long Term Effects of Stress on The Body – Gina Kloes*
- *90:10 The Single Most Important Thing You Can Do – Dr. Mike Evans*
- *Adrenaline, Cortisol, Norepinephrine: The Three Major Hormones Explained – Huff Post Healthy Living*
- *The Physiology of Stress: Cortisol and the Hypothalamic-Pituitary-Adrenal Axis –Dartmouth Undergraduate Journal of Science*

- *Corticotrophin-releasing hormone – You and Your Hormones*
- *75 Signs, Symptoms and Alerts of Adrenal Fatigue Syndrome – Dr. Lam*