

The Biology of Stress

excerpted from

The Great Life Makeover: A Couple's Guide to Weight, Mood, and Sex
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Stress is not just a mental state; *it's a whole-body experience*. It can pervade all aspects of your health and well-being. And unless you learn to tame it, stress can leave you depleted physically and spiritually.

Your body's response to stress is controlled by the *autonomic* nervous system, but that's not all it does. The same system is in charge of many different organ systems in the body. It regulates your heartbeat, controls your breathing, and keeps your gastric juices flowing so you can digest your food.

There are two main components of the autonomic nervous system: the *sympathetic* nervous system and the *parasympathetic* nervous system. Especially relevant, also, is the *enteric* nervous system.

The sympathetic nervous system (fight or flight) gets switched on when we're under stress. It's designed to protect us from danger, but as you'll see, it's a double-edged sword.

The parasympathetic system (rest and digest) is involved in healing, restoring, and repairing the body. It shuts down when we're in stress mode.

The enteric nervous system is a network of nerves centered in the digestive tract. It was recently discovered that these nerves produce some of the same chemicals found in the brain (so maybe there's something to "gut feelings" after all!), and it is in intimate communication with the sympathetic and parasympathetic systems—so much so that some regard it as the third component



of the *autonomic nervous system*. We mention it because of the profound effect that stress can have on the gut, from poor digestion to abdominal distress to poor absorption of nutrients.

When you're under stress, your body responds in a particular way. It prepares you for the worst. Your sympathetic system goes into high gear, switching the body into what is known as flight-or-fight mode. It's the same stress response system that became activated when our cavemen ancestors were being chased by predators. But in terms of typical modern-day stress—the demanding boss, the angry spouse, the unpaid tuition bill, the wait at the airport—more often than not it's overkill.

First, your brain orders a series of physiologic reactions that rev up the body. Your adrenal glands, located on top of the kidneys, are instructed to pump higher levels of stress hormones—adrenaline, noradrenaline, and cortisol—

into your bloodstream. Your kidneys release renin, a hormone that raises your blood pressure. Your heart pumps faster, and blood is pulled away from your midsection and diverted into your legs to prepare for flight. Your blood sugar soars. Your pupils dilate so that you can see better at night. Your immune cells spew out pro-inflammatory chemicals to promote blood clots (to stop bleeding) and fight infection in case you're injured. And then, when you're out of danger,

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your parasympathetic system takes over, bringing it back down to normal.

Under ideal conditions, the production of stress hormones is shut down quickly. (But) as you get older it becomes more difficult for your body to dispose of stress hormones. If you go into stress mode too often, over time, your cells become desensitized to the effect of stress hormones...and your adrenal glands keep pumping out more and more of them, even when you no longer need them.

In the brain, high levels of cortisol, in particular, are associated with imbalances in neurotransmitters, such as serotonin, acetylcholine, and dopamine—chemicals that allow brain cells to communicate with one another and to control mood



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and behavior. The wrong balance of these neurotransmitters—too much of one, or too little of the other—can lead to depression and anxiety.

Stress can also effect your sex life, both directly and indirectly. Men require some input from the parasympathetic system to get and maintain an erection. Furthermore, when you're in stress mode, your adrenal glands are so busy making stress hormones that they can't focus on their other jobs, which include making sex hormones. When the ovaries shut down after menopause—and to a lesser extent, when the testes slow down during andropause—the adrenals help compensate for the loss by making estrogen and testosterone.

Without enough sex hormones, you're not going to be thinking about sex. Not to mention the fact that when you're stressed out and feeling revved up all the time, it puts you in a very bad mood. Its not surprising that stress would have such a profound impact on mood—what is remarkable, however, is the damage that unrelenting stress can inflict on every single organ system, from your brain to your bones to your immune system.

Excess stress can make you age faster, and it can even make you fat. Scientists have recently discovered a biochemical link between stress, weight gain, and prediabetes.

Heart disease is the Number One killer of men and women in the Western world, and here, too, stress can be a major culprit. Stress hormones promote free radicals and inflammation, which can damage coronary arteries.

Your mood can also have a profound effect on your heart. Pent-up feelings of

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anger and hostility are associated with an increased risk of heart disease. People who suffer from mild to moderate depression are two to three times as likely to have coronary artery disease as those who do not, and those who suffer from severe depression are at five times the risk of coronary artery disease and also are at increased risk of cardiac death.

Have you ever noticed that when you are under a great deal of stress, you tend to be more vulnerable to colds and other

illnesses? It's not your imagination. Chronic exposure to emotional stress can dampen your immune responsiveness, reducing the effectiveness of specific disease-fighting cells. In fact, there's a discipline designed to study this phenomenon; it's called psycho-neuroimmunology, and it is the foundation of mind-body therapy.

Studies show that a relationship marked by anger and hostility can weaken your immune system and make you more vulnerable to a variety of illnesses and possibly even cancer. Furthermore, older couples are more at risk of experiencing these negative changes in immune function, possibly because they are starting off with weaker immune systems. In fact, one intriguing study showed that even a typical argument between a couple could delay the amount of time it took a wound to heal by at least twenty-four hours.

Learning how to manage stress not only makes you feel good; it is absolutely essential for your health and well-being. And it is also of vital importance to your relationship.

A good relationship has proven health benefits; being married has been associated with better health and longer life. The more you and your partner find common ground to support each other, the better for both of you. Most important, play together. The act of play and the experience of laughter have proven health benefits to health and well-being.

Dr. Daniel Monti is a featured Presenter at the 35th Annual YRS Conference, October 31-November 1, 2009