

To: Body-Mind Owners: All Makes and Models

From: Your Stress-Response System

Re: Your Stress

Message: High Priority!



Dear Owner:

As the system primarily involved in your body-mind's stress response, we want to keep you informed about our operations so that you will be in a better position to keep us in good working order. Your body-mind's stress response came with your basic equipment. It is intended to prepare you to fight, flee, or freeze in case of a real emergency so that you can survive.

Specifically, we are a coordinated group that includes the *autonomic nervous system* (ANS) and the *hypothalamic-pituitary-adrenal axis* (HPA axis for short). Here's how we operate. You have a threat detector located deep inside your brain called the *amygdala*. When the amygdala registers the information that your safety is threatened or that there's something out there to worry about, the *sympathetic part* (SNS) of the *autonomic nervous system* (ANS) leaps into action to help protect you. Your brain immediately sends signals to the interior of the *adrenal glands*, which sit on top of your kidneys, telling them to release the hormone (and neurotransmitter) *adrenaline* into your blood-stream. Remember that hormones are chemical messengers that have powerful effects on your body-mind. If you can recall feeling your hair stand on end, your heart beginning to pound, your palms beginning to sweat, and your stomach turning (possibly when faced with a test you didn't expect), you know our power to get your system revved up to fight, freeze, or run away.

We also provide an additional homeland-security system called the HPA axis. Two of our components (*hypothalamus* and *pituitary*) are located deep in the brain. After a red alert from the amygdala, the hypothalamus gets this ball rolling by secreting hormones into the hypothalamic-pituitary circulatory system. The principal one is *CRH* (*corticotrophin-releasing hormone*), which triggers the pituitary to release *ACTH* (also called corticotrophin). *ACTH* jump-starts the adrenals to release another stress hormone, called *cortisol*, from their surface into the bloodstream. If

you've ever been scared to death watching a horror movie alone at night, you know that adrenaline works within seconds, but cortisol backs it up over the course of minutes or hours. It takes about an hour for the effects of cortisol to leave the system. When the stressful situation is over and you have prevailed, the other arm of the ANS, called the *parasympathetic nervous system* (PNS), moves into action by relaxing your body-mind and allowing it to rebalance in preparation for the next threat. The *vagus nerve* that originates in the brain is part of the PNS and sends signals to the heart (and other organs) that regulate the heartbeat (among other things). The heartbeat slows down as a result of activation of the vagus nerve. It works like a brake on the stress-response system. When you inhale, you activate the sympathetic system, and when you exhale, you activate the parasympathetic system. That's why some relaxation practices teach extending the exhalation to strengthen the parasympathetic (or "cool-down") response. Let's try it. Take a deep breath right now, and then exhale through your mouth in a slow, long, smooth sigh. Whew! Thank goodness for that.

Anyway, so much for our trusty apparatus.

It has come to our attention that many owners are activating the stress-response system for extended periods of time without a break. Because owners might not realize the damage they do to their systems when they are under constant stress, we take the opportunity in this memo to present it in some detail.

We find it hard to believe that this constant activation is due to unceasing, real threats on owners' health and safety (such as constantly coming face-to-face with wild animals or other equally scary situations). We've been told that owners are activating their systems because of internal threats like worries, fears, anger, resentments, foiled expectations, disappointments, and so forth. Now we acknowledge that life can be really tough. We have the greatest sympathy for what owners are going through. However, we—the elements of your stress system—need to inform you of the fact that we are being overworked when the stressful events that keep us going are happening in owners' minds. In other words, owners who

constantly ruminate, let problems fester, hold on to jealousy, or continually feed the fires of anger are really wearing us out!

Here's the view from the inside. Constant activation of the system results in too much cortisol pumping into the bloodstream. Too much cortisol dismantles your *immune system*. Remember the immune system? Immune system cells are constantly on patrol, killing invaders and saving you from illness. Without a well-functioning army of immune cells, your body isn't going to heal from invaders very well. If you get sick (low immunity) during exam time (high stress), don't say we didn't warn you.

Too much cortisol also damages and even kills cells in your brain (*hippocampus*) that are responsible for learning and memory. That's not going to help you graduate! Stress hormones like adrenaline cause the heart to pump blood faster, potentially resulting in high blood pressure and damage to your arteries because of the force of blood on the delicate vessels. Stress hormones like cortisol increase your appetite, especially for comfort food, because your body reads their chemical message as "Yikes! An emergency! Better store up some energy so I can run away when I need to." Stress hormones are related to stomach discomfort, and you know that's no fun either. Recall that it takes about an hour for the body to sop up the excess cortisol floating around in the bloodstream. If you have even one stress reaction per hour—well, *you* do the math. And remember, you probably don't really have to encounter some terrible threat like a wild animal on your way to school. Your body- mind, alas, doesn't know the difference between "real" and "mental" stress. That's what keeps us so overworked. Thinking about stressful things makes us work overtime. Your mind is the gateway to stress.

Did you realize that about 70 percent of cases of insomnia are caused by stress? Body-Mind Owners need their sleep to be on top of their game, so this can be a big problem. Lack of sleep can make you grouchy, not to mention pretty sad. The stress-related changes in your immune system also result in making too much of certain chemicals, called *cytokines*, that float to the brain and affect your moods. It's normal to feel pretty sad when bad things happen, but too much stress can make you depressed if you don't know how to roll with it.

Last, let's not forget the risk of addictions. We understand that stress seems to be temporarily reduced by taking an addictive substance or engaging in some stress-avoidance activity. The point here is that it's temporary. You can count on feeling a crash shortly afterward. This only increases anxiety and all those awful stress-related feelings.

We could go on and on, but we think we've made our point. We want to keep on working for you so that you'll have a happier, healthier life. Here's the bottom line: the things that stress you out in your life are not going away. You need to learn how to relate to your stress in ways that don't harm your system. Working with your mind and your mental attitude is a great place to start. Please, keep up the good work.

Yours truly,
Your Body-Mind Team

