

Self Induced Sickness

By Robert M. Sapolsky

It's two o'clock in the morning, and you are lying in bed. You have something immensely important and challenging to do the next day. You have to get a decent night's rest, but you're still wide awake. You try different strategies for relaxing: You take deep, slow breaths; you imagine a restful mountain scene; but the thought that keeps intruding is that, unless you fall asleep in the next minute, you won't be able to function tomorrow. Thus you lie there — more tense by the second.

If you do this on a regular basis, somewhere around two-thirty, when you're lying there clammy and hyperventilating, an entirely new, disruptive chain of thoughts will no doubt intrude. Suddenly, amid all your other worries, you will begin to contemplate that nonspecific pain you've been having, or that feeling of exhaustion, or those headaches.

When it's two-thirty on those mornings, I always have a brain tumor. They're very useful for that sort of terror, because you can attribute every conceivable nonspecific symptom to a brain tumor, and convince yourself it's time to panic. Perhaps you do, too; or maybe you lie there thinking that you have cancer, or an ulcer, or that you're about to have a stroke.

The medical profession has finally come to recognize how our emotions, personalities, feelings and thoughts affect our bodies. *Stress can make you sick* and even the diseases we are sure we have as we lie awake in terror can either be caused or made far worse by stress.

How can purely psychological stressors make you sick? What might stress have to do with your vulnerability to depression, or with the speed at which you age? And how can you cope with the stressors that surround you?

Perhaps the best way to begin is by making a mental list of the sorts of things that you find stressful. No doubt you would immediately come up with some obvious examples — traffic, deadlines, family relationships, money worries. But what if I said, "You're thinking like a human. Think like a zebra for a second." Suddenly, new items might appear at the top of your list — serious physical injury, predators, starvation. For animals like zebras, the most upsetting things in life are ***acute physical stressors***.

Imagine that you are a zebra, and a lion just leaped out and ripped open your stomach; you've managed to get away, and now you have to spend the next hour

evading the lion as it continues to stalk you. Or, perhaps just as stressfully, you are that lion, half starved, and you had better be able to sprint across the savanna, at top speed and grab something to eat, or you won't survive. These are extremely stressful events that demand immediate adaptations if you are going to live. But fortunately, your body's responses are brilliantly adapted for handling these sorts of emergencies.

An organism can also be plagued by **chronic physical stressors**: Drought, famine, parasites — not the sort of experience we have often, but central events in the lives of non-Westernized humans and most other mammals. The body's stress-responses are reasonably good at handling these sustained disasters.

There is a third category of ways to get upset: **Psychological and social stressors**. Regardless of how poorly you are getting along with a family member, or how incensed you are about losing a parking spot, you don't settle that sort of thing with a fistfight. Likewise, you don't have to stalk and wrestle down your dinner. Essentially, humans live well enough and long enough, and are smart enough, to generate all sorts of stressful events purely in their heads. How many hippos worry about what they are going to say on a first date? Viewed from the perspective of the evolution of the animal kingdom, psychological stress is a recent invention. You can experience wildly strong emotions — provoking your body into an uproar — linked to mere thoughts. You can sit facing another person, doing nothing more physically strenuous than moving little pieces of wood now and then, yet this can be an emotionally taxing event. Chess grand masters, during their tournaments, can place metabolic demands on their bodies that begin to approach those of athletes during the peak of a competitive event. Or you can do nothing more exciting than signing a piece of paper, but if you have just signed a significant document, your physiological responses might be shockingly similar to those of a zebra who has just been slashed by a lion. And if you spend months on end twisting your innards in anxiety, anger and tension over some emotional problem, this might very well lead to illness.

If you are that zebra running for your life, or that lion sprinting for your next meal, your body is superbly adapted for dealing with such short-term physical emergencies. But when you sit around and worry about stressful things, you turn on the same physiological responses — and they are potentially a disaster when provoked chronically for psychological reasons.

I must call forth a concept that you were tortured with in ninth-grade biology and probably have not had to think about since — homeostasis: The idea that the body has an ideal level of oxygen that it needs, an ideal degree of acidity, an ideal temperature, and so on. A stressor can be defined as anything that throws your body out of homeostatic balance — for example, an injury, an illness, subjection

to great heat or cold. The stress-response, in turn, is your body's attempt to restore homeostatic balance. This consists of the secretion of certain hormones, the inhibition of others, the activation of the nervous system, and other physiological changes. These are stress-responses that would suffice for that lion or zebra: If being half dead with hunger or half dead from blood loss doesn't qualify as being out of homeostatic balance, then what does?

But you can turn on a robust stress-response based solely on anticipation. Whether you are a human surrounded by a bunch of threatening gang members in a deserted subway station, or a zebra face-to-face with a lion, your heart is probably racing, even though nothing physically damaging has occurred (yet). But, unlike the zebra, you can turn on the stress-response by worrying about something that could happen six months from now. Zebras and lions may see trouble coming, and mobilize a stress-response in anticipation, but they can't get stressed about things so far in advance.

And sometimes humans can be stressed by things that simply make no sense to zebras or lions: They do not become anxious about money, or even about the inevitability of death. However, humans' experiences are replete with psychological stressors. When you activate the stress-response for no reason at all, or over something you cannot do anything about, you can bring anxiety, neurosis, paranoia or depression upon yourself.

You sit in your chair not moving a muscle, and simply think a thought — a thought having to do with your feeling angry or sad or euphoric or lustful — and suddenly your pancreas secretes some hormones. *Your pancreas?* How did you manage to do that with your pancreas? You may not even know where your pancreas is. In addition, your liver is making an enzyme that wasn't there before; your spleen is faxing a message to your thymus gland; blood flow in little capillaries in your ankles just changed. All from thinking a thought.

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