

Our Stress, Our Health

When Dr. Robert Sapolsky compares us to zebras in his book Why Zebras Don't Get Ulcers, he is trying to make an obvious point about stress. When the zebra wthatis to go through life grazing and mating and well, just frolicking about with no particular aim except further existence, is set upon by the lion, a whole lot of things happen that we are familiar with in a stress response kind of way.

The zebra mobilizes its fight or flight stress response in a variety of instantaneous reactions that are quite predictable: You need energy and maximum physiological efficiency or it is going to be you and not your slower and older buddy who is going to be lion food for the next couple of days. Energy is mobilized from storage sites and put to use—all of it if necessary, and fast. This means no energy for normal cell growth of muscles or bones or anything else. There is no attention given to immunes systems because you are not thinking of that eventual germ when there's a lion on your tail. There is no cognition of pain perception so you don't even know it when he scratches or bites you, just as long as you can keep on moving.

Suddenly your heart rate goes up along with your blood pressure and your breathing rate, and your vessels tighten down to make sure this happens so that blood which is needed by a whole array of muscular systems has the blood and oxygen to do it. If you were eating, appetite and digestion stops. If you were frolicking with Zelda the zebra all thought of foreplay not to mention the sexual act itself are completely stricken from the mind. Critical thinking skills go into hyper drive, completely different from the amorous sloth you were just seconds before. Of course anything you had leftover in the bowels or bladder is immediately evacuated for who wants to be carrying a load like that at a time like this. Better to be a bit embarrassed later than to not be able to talk about it at all.

Anyway, I'm sure you can begin to see that stress has its markers in our physiology and that we are much more complex than zebras. An hour after the major stressful event the resumption of the simple life for the zebra is completely back to normal. If you are a zebra you are once again eating and calm and wondering about resuming foreplay with Zelda. Unfortunately, most of our stressors are more complicated than the occasional lion on the veld. Even if it were, our expanded cerebral cortex would probably make us relive the event over and over again, each time reigniting some semblance of anticipatory stress or fear.

When in stress, imagined or real, your brain filters these into the hypothalamus of the brain and effects the reactions, both stimulatory and inhibiting responses through the pituitary secretions to the rest of the body. Without too much detail we can simply say that your allostatic control centers are flipping a lot of adaptation switches all at once. Your adrenal responses are ignited releasing not only epinephrine and norepinephrine excitations (adrenaline) but longer lasting and acting glucocorticoid responses as well. Active blood sugar (glucose) in the blood goes up even as the ability of the body to absorb and store nutrients such as glucose is stymied. Through the release of prolactin all reproductive capability is shut down. Vasopressin is released which constricts our blood vessels and raises the blood pressure and heart rate. Growth hormone secretion is also inhibited.

If stress levels are prolonged we get a more prolonged glucocorticoid response that in some sense is activating potentially all of these responses fairly persistently and with that changing our basic health to less than optimum levels. In this paper we want to explore more specifically what some of these changes might be and how they affect us in the chronic sense. When I started this business, I defined my patients' health by what they did and did not eat, how toxic their environment was and how much exercise they did and did not do. Since that time I have revised this somewhat and started to see our health as the extension of the stressful soup we live in.

What stress can do to us

Two people go into a classroom to take a test. They are both of approximately the same IQ level and have studied about the same for the test. Person one is excited and can't wait to show how much of the material they understand. The second person is apprehensive. He or she is worried that a bad mark on the test will reflect a whole lot of things about who they are; like really reveal that what their parent always said was true and that they really aren't that bright as part of their nature, or that it will just reflect their low socioeconomic background or that they really don't belong here at all.

Instantly, we can see that what to one person is an opportunity to succeed and feel good about themselves, is a major stressor and fear. We can pretty well guess that one is going to do very well, while the next one may not do well at all. Furthermore they have manifested a level of stress that may affect themselves physically in many ways.

High Blood Pressure and Atherosclerosis

Under stress or pressure, our heart rate speeds up and our vessels constrict to send blood to all those muscles under that fight or flight response. This is a bit short and simple, but all this pressure causes scarring in the vessels, which may agglomerate into blockages. When this eventually happens to the vessels feeding the heart, it is called an ischemia and a major blockage is called a myocardial ischemia, or cardiac arrest. Where the vessels have in general become overburdened, over time a clogging of the vessels may occur leading to phlebitis in the legs or even release and cause a stroke in the brain among other complications of blood circulation like neuropathies and circulatory disorders.

Immunodeficiency, Weakness and the Ability to Heal

When we mobilize for stress, digestion and its related nutrient storage stops and mobilization of stored energy begins. When it is just ongoing stress; glucocorticoid modulated stress, also blocks the absorption of nutrients. What's more, under stress, even ongoing stress, the body is set to convert stored energy into usable nutrients in the blood stream. So you're trying to get that report finished before the boss fires you, and through this stress all your blood is tied up in your muscles making them tight and ready for action with no place to go. For this it sacrifices storage of energy and supply of energy and blood to muscles like the stomach and kidneys, so that you feel sick and nauseous and have to pee all the time and so wound up and tight that you are ready to snap.

Diabetes Mellitus, or type II diabetes, should be the province of the overweight and out of shape as fat cells in these people are filled to capacity and resists absorption of more glucose. This is why it is also called insulin resistant diabetes. These high levels of glucose and fatty acid gum up the blood, especially in the kidneys causing small strokes

in the small capillary beds, the eyes leading to cataracts and can even cause atherosclerotic plaques. However, I have had many patients who are not necessarily prone to being overweight in any sense of the word, but have gotten to a place in life where emotional stress is causing the same symptoms.

That Whole Digestion/Bowel Thing

Digestion happens in a parasympathetic state (the opposite of stress---which is why I skip business lunches). With the addition of stress our digestion can shut down altogether. We used to think of ulcers when we thought of stress. Now science has a better idea. It has decided that it is caused by a bacterium called *Helicobacter Pylori*. My son's ninth grade science book even says so. After further research, we have come to discover that ulcers still appear in people without any evidence of *H. Pylori* and in only 10% of people that are full of it. However, ulcers do show up in antacid popping individuals with high stress and they know from whence their ulcers came. Let us also keep in mind that the presence of large amounts of bacteria are present where the immunity is low and as we shall discuss, stress plays a part in that as well. Moreover, hydrochloric acid decreases in the presence of constant stress, and accordingly your body does little to provide the protective lining of the mucous and stomach lining that in itself requires a lot of body energy to maintain. When stress ends hydrochloric acid secretion returns full force and *batta bing batta boom*, there is your ulcer.

Find a person with chronic stress and you find a person with bowel problems, looser and more frequent bowel movements to nothing at all. In some stress, the digestion or motility and absorption of the small intestines slows down or stops and the large intestine increases, but may not have time to squeeze out the liquid which leads to those loose bowels. In some cases the response to stress can be different and more severe in the small intestines, where the result is more likely to be constipation. Of course an often chosen diagnosis by the doctor is just irritable bowel, but in more severe cases it can just as easily be Crohn's Disease or Ulcerative Colitis.

Aside from the obvious demands of financial stress, deadlines or time-pressured stress, overwork and multitasking, I believe we have to look at who we are and why what one person sees as a stressor, another person feels right at home with