Long-term Physiological Effects of Stress

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The experience of stress is a universal experience originating from our animal instincts, cave-man existence and triggered by challenges of everyday life, significant life events, losses, traumatic experience, natural disasters, serious accidents, work demands, disrupted sleep, and even things such as a raise, move, or the birth of a child. Stress may come from internal thoughts, expectations or external environmental factors such as noise, urban environments, or overcrowding.

We usually conceptualize stress in negative terms and something that must be confronted or avoided. However, healthy stress and challenges in small doses is often good. Our bodies have a mechanism to allow us to survive, adapt and respond to stress, releasing hormones for energy and creating a fight-or-flight physiological response. Ultimately, being able to survive and master challenges is helpful to our survival and sense of confidence and competence.

While these Autonomic Nervous System (ANS) changes may be evolutionary and psychologically advantageous for us under certain circumstances, releasing these hormones and remaining in "fight or flight" mode over a long period of time can have serious long-term effects on our health and psychological well-being.

The Biology Behind Releasing Stress

A number of changes occur in your body when you are feeling stressed. One of the functions of the hypothalamus, the region of the brain that coordinates the ANS, is the regulation of a steady state, "homeostasis" in the body. The hypothalamus sends signals to the endocrine system, which is composed of a complex network of hormone-producing glands which govern metabolism, growth, development, sexual function, sleep, and more. In response to threat or other stressful stimuli or circumstances, the hypothalamus sends a signal to the pituitary gland which in turn sends a signal to the adrenal glands, which are located just above the kidneys. Importantly, the signals tell the glands to secrete a hormone called cortisol. The cortisol then attaches itself to receptors throughout the body which interact with other cells to perform their function.

Cortisol is essential in regulating metabolism and immune response, but in stressful situations, the increase of cortisol and adrenaline in the bloodstream due to stress elevates your heart rate and blood pressure, and increases your body's energy stores. This short-term stress reaction is a good part of our survival fight-or-flight response and, in most cases, allows us to deal with threats or crises with increased strength, acuity, stamina and focus. However, even with acute stress too much can interfere with cognitive flexibility, reasoning, tunnel vision, and can create an experience of pain or being overwhelmed. Stress can also intensify or reactions to stimuli or events, leading to a cycle of more stress.

Long Term Effects

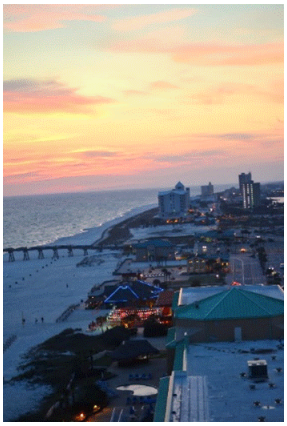
While there are aspects of short-term response to stress which are adaptive, and some which, if excessive, interfere with functioning, most of the long-term effects of being chronically in an aroused fight-flight, stressful state are problematic. Continued high levels of stress and exposure to trauma can have serious long-term effects on physical and mental health. The stress response causes the heart to beat harder and faster. Over a prolonged period of time, this can lead to high blood pressure (hypertension). In addition, during periods of stress, the GI (gastrointestinal) tract slows and nearly ceases processes, and blood is diverted to the muscles in order to prepare for action in the fight-or-flight response. Prolonged stress can cause various GI problems such as chronic constipation and stomach ulcers.

Long-term stress also negatively impacts on the effectiveness and function of the immune system. Adrenal hormones suppress the formation of T lymphocytes, which are vital to our immune system. These cells help fight various bacteria and illnesses in our body. By suppressing the formation of these cells it is evident that the body would struggle to combat foreign organisms, thus, increasing your chances of falling ill. According to the American Psychological Association "Americans report irritability or anger (42 percent); fatigue (37 percent); lack of interest, motivation or energy (35 percent); headaches (32 percent); and upset stomachs (24 percent) due to stress. A smaller percentage report having a change in appetite (17 percent) and sex drive (11 percent).".

According to a Harvard Medical School publication {link here: http://www.health.harvard.edu/newsletter_article/why-stress-causes-people-to-overeat}, individuals who are stressed in the short term may briefly lose their appetite due to the hypothalamus's release of a corticotrophin-releasing hormone that acts as an appetite suppressor. However, those who are continually stressed out long-term are more likely to overeat, or "stress eat", because prolonged elevated cortisol levels induce a motivation to eat. This reaction to long-term stress has been linked to weight gain.

Overeating due to stress is just one of the factors that can lead to heart disease, which is the number one killer of Americans. The American Heart Association says that high cholesterol levels, high blood pressure, physical inactivity, and smoking are often brought on by stress and all play a role in increasing the risk of heart disease.

According to the National Institute of Mental Health those individuals who are subject to long-term stress are at elevated risk for not only heart disease, but diseases such as diabetes and generalized anxiety disorder. Stress can also suppress immune, sleep, digestive and reproductive systems in a person's body. This can cause headaches, sleeplessness, sadness, anger, irritability, and even a higher risk of catching common colds and the flu. Anxiety and depression also follow long-term stress in some cases. Overall, long-term stress increases risk of illness and damages emotional health.



One approach to reducing stress is consistently engaging in self-soothing and grounding behaviors. These techniques can help counteract some of the physiological and emotional impact of being in a hyper stressed state. Grounding and self-soothing techniques are strategies used in time of distress to bring yourself to a state of emotional well-being. Examples of techniques include deep breathing, progressive muscle relaxation, exercise, engaging mindfully in a walk, and listening to music. These techniques utilize both attentional focus and body movements to draw attention away from triggers of stress to internal soothing behaviors for in the moment relief (Dezelic, 2013).

Psychologists can assist with developing stress management strategies, and to assess and treat more significant depressive and anxiety reactions. Some tips about coping with stress and further educational articles are provided below:

In the CPANCF Articles and Archives

Stress Physiology Fight or Flight
http://cpancf.com/articles_files/stressphysiologyfightflight.html

Stress Management Quick Tips
http://cpancf.com/articles_files/Stressmanagementquicktips.html

Coping with Hurricane Stress
http://cpancf.com/articles_files/copinghurricanestress.html

Stress Management During the Holidays
http://cpancf.com/articles_files/art_55attached_file.html

Helping Child Deal with Natural Disasters
http://cpancf.com/articles_files/helping_child_deal_with_natural_disasters.html

Managing Stress and Worry A Power-point presentation by one of our former Associates, now practicing in the Washington, D.C. area:

Offsite

Stress-Relief-Tools.COM
Biology of Stress
Impact of Stress American Psychological Association

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