

How Does Stress Get Under Your Skin?

As described in '[What Is Stress](#)', stress can affect us in many ways. Stress can change our emotions, thoughts, and behaviors. Although we may not commonly think about it, stress can also affect us physically, placing wear and tear on our bodies. When you're stressed you may feel or experience changes in your physical health as well (Table 1).

Table 1: Common Effects of Stress on Your Body
<ul style="list-style-type: none">• Headache• Muscle tension or pain• Increased heart rate• Chest pain• Fatigue• Change in sex drive• Stomach upset• Sleep problems

Being able to recognize that changes in your physical health are related to stress, and not illness, is an important first step. If you know you are stressed you can work to actively manage and reduce your stress (see '[Reducing Stress](#)'). Stress that's left unchecked can lead to serious health issues, such as high blood pressure, heart disease, obesity and diabetes.

How does stress move from upsetting your stomach and making you irritable to furthering the development of high blood pressure and other chronic diseases? Investigators with the Center for Translational and Prevention Science (CTAPS), and researchers around the world, are investigating how stress gets "under the skin". The goal of their research is to better understand how high levels of chronic or repeated stress can lead to long-term health issues.

Research in this area continues to advance, but we already know at least three ways that stress gets "under the skin", by:

- Changing the hormones in our blood stream
- Changing our immune system
- Changing our brain

Changing the hormones in our blood stream

When initially faced with a stressful situation, your body releases stress hormones into the blood stream. These hormones prepare your body to meet the challenge presented by the stressful situation. You are getting ready for the “fight or flight” response. Under chronic or repeated stress, the hormones continue to be released. After a period of continued release, you may be left with chronically high or chronically low hormone levels that can negatively affect your health.

As one example, the hormones that are released when you’re stressed affect the function of other bodily processes, including your cells’ ability to react to insulin. Insulin helps you turn sugars and starches into energy for your body. If your cells become resistant to the effects of insulin, your pancreas will produce greater amounts until it cannot produce enough insulin to process the sugars and starches you eat. When there isn’t enough insulin present, your blood sugar rises and your risk for developing diabetes and heart disease increases.

Changing our immune system

Your immune system is very important to your health. It is responsible for helping you heal when you have an injury or infection, such as a cut on your finger or a flu virus that makes you feel sick. When you experience prolonged periods of stress, your immune system can be worn down, resulting in fewer immune cells. When your immune system is worn down, you are less able to recover from an injury or fight off an infection. Stress can also lead your body to have overly aggressive and prolonged responses to injury or infection.

Changing our brain

Your brain is the ‘control center’ for your body and directs much of what you say, think, and feel. Your brain continues to develop over time, with new connections being formed and old connections being cut. Chronic or repeated stress can affect how your brain develops. Stress changes how the brain functions and, in some cases, can change the structure of parts of the brain. When stress affects the brain, you may experience changes in how you physically respond and behave. You may feel anxious or depressed and experience memory problems or difficulty focusing. Stress can also affect your decision making, leading to risky behaviors.

Summary

It is important to recognize that chronic or repeated stress affects both your mental health and physical health. The “under the skin” effects of stress may not be immediately clear, but carry long-term risks for your health and well-being. Once you recognize you are experiencing the effects of stress, there are actions you can take to manage and reduce your stress level (see [‘Reducing Stress’](#)).

Sources

1. Mayo Clinic, Stress Symptoms: Effects on Your Body and Behavior, found at <http://www.mayoclinic.org/healthy-living/stress-management/in-depth/stress-symptoms/art-20050987?pg=1>, accessed on 2/18/2015.
2. Medline Plus, Insulin Resistance, found at <http://www.nlm.nih.gov/medlineplus/metabolicsyndrome.html> , accessed on 2/26/2015.
3. PsychCentral, Stress Hormone Affects Immune System, found at <http://psychcentral.com/news/2008/07/15/stress-hormone-affects-immune-system/2608.html> , accessed on 2/26/2015.
4. McEwen, B.S. (2006). Protective and Damaging Effects of Stress Mediators: Central Role of the Brain. *Dialogues in Clinical Neuroscience*, 8(4): 367-81.
5. Miller, G. E., Chen, E., & Parker, K. J. (2011). Psychological Stress in Childhood and Susceptibility to the Chronic Diseases of Aging: Moving Towards a Model of Behavioral and Biological Mechanisms. *Psychological Bulletin*, 137(6), 959-997. doi: 10.1037/a0024768
6. Gunnar, M., & Quevedo, K. (2007). The neurobiology of stress and development. *Annual Review of Psychology*, 58, 145-173.