

THE HEALTH NUGGET



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Leaky Faucets

Drip, drip, drip, drip . . . For the whole month that we held evangelistic meetings on the Philippine island of Mindanao, that is what was happening at the kitchen faucet in our home in Malo, Washington. The damage done was so extensive that we had to replace floors, walls and carpet—all as a result of one drip at a time.

Daily stress is just like that leaky faucet, only its effect on our bodies is far more serious.

Stress triggers the release of specific hormones or chemical messengers that are meant to perform certain functions during stressful encounters. Unfortunately, not only are we facing more high-stress situations these days, but we're also living with lower-grade daily tensions and pressures that strain our defense systems. We may not always be fending off major toxic threats, but we can develop slow leaks.

Stress releases hormones from the hypothalamus, pituitary gland, and adrenal glands. The adrenal glands, for example, release *epinephrine*, also called *adrenaline*. Adrenaline is a familiar chemical, dominant in triggering the “fight or flight” response. It is secreted as a direct reaction to stress. A sudden demanding experience—whether being chased by a dog or facing an unrealistic deadline—increases heart rate, blood pressure, blood-sugar levels, and muscle activity. While our built-in defense system is highly sophisticated and uses a complex array of hormones, adrenaline is a key player. However, “anything—pleasant or unpleasant—that arouses

your adrenaline system for too long and mobilizes your body for ‘fight or flight’ predisposes you to stress disease. Your body simply adapts to living in a constant state of emergency—and you feel no discomfort until damaging results occur.”¹

We all know that chronic stress is bad for us, but few fully understand how this kind of stress cranks up the intensity of our adrenaline response. Cornell neurobiologists have discovered that chronic stress actually alters proteins on the surface of cells that secrete adrenaline, molding a sort of “molecular memory.” Over time, this causes the cells to release adrenaline more quickly and easily.

David P. McCobb co-authored a report with Jiuyong Xie in the April 17 issue of the journal *Science*. He explains, “The hormonal response to stress is different for every individual and seems to be controlled by some combination of inheritance and lifestyle. . . . Our study points to the effect of lifestyle. Stressful experience is remembered and biases us toward responding forcefully to subsequent threats.”²

These Cornell researchers report that adrenal cells dump adrenaline into the blood at a rate that is determined “not only by the necessary incoming neural signals from the brain but also by the intrinsic electrical excitability of the adrenal cells themselves.” Apparently the structural detail of the surface proteins is responsible for this excitability, allowing certain electrical signals to cross the cell membrane. According to the researchers, structural detail is controlled at the gene level by steroids.

McCobb explains that forceful heart, lung, metabolic and behavioral reactions help cope with acute threats, “but those reactions are not healthful in the long run. We found that steroid stress hormones dictate whether the potassium channels controlling adrenaline release are constructed with or without an optional piece called STREX, for *stress exon*. This STREX causes the channel to open more easily, which favors rapid, excitable responses and fast secretion of adrenaline.”³

As the researchers noted, the greatest factor affecting the stress response is lifestyle or the constancy of an unhealthy stress level. Chronic stress alters our stress-coping biology, allowing for immediate surges of adrenaline and instantaneous excitability. The bad news is that stress promotes stress. We enter into a self-destructive cycle to which many become addicted.

Stress hormones can produce a high as powerful as morphine. When that rush of energy hits, less sleep is needed and the individual feels a surge of stimulation and power. Professionals, often highly successful in their fields, become addicted to their own flow of adrenaline. Demanding careers, especially those dealing with frontline emergencies, can lead to a dependency on our own natural chemicals that are produced in the excitement of crisis. Even continuous, highly charged emotional crises have the same effect, because mental stress from our own thought processes can negatively impact us to the same degree as external stress.

“Adrenaline eventually becomes addictive. Just as an alcoholic must have alcohol, an adrenaline addict is physically and psychologically addicted to a regular dose of adrenaline. And just as is the case in most other chemical dependencies, adrenaline addiction is extremely

destructive to the body.”⁴ Prolonged, elevated stress hormones over-stimulate the thyroid, clot blood faster, and raise cholesterol, blood sugar and insulin levels and keep them there. Physical and emotional burnout follows. This combination of effects can lead to impaired immune function, reduced glucose utilization (a major factor in both diabetes and weight control), increased bone loss, reduced muscle mass, increased fat accumulation, impaired memory and learning, and autoimmune diseases. Basically the body begins to break down—all as a result of the drip, drip, drip of stress.

Contrast this all-too-common experience with the picture Scripture paints for us in Psalm 23. “The Lord is my Shepherd, I shall not be in want. He makes me lie down in green pastures, He leads me beside quiet waters, He restores my soul.”⁵

1 http://www.doctorshealthsupply.com/homeopath/adrenaline_and_stress.htm.

2 “Molecular memory of stress prompts adrenaline surges,” Roger Segelken, <http://www.news.cornell.edu/Chronicle/98/6.25.98/adrenaline.html>, *Science*, “Control of Alternative Splicing of Potassium Channels by Stress Hormones.”

3 Ibid.

4 *Deadly Emotions*, Don Colbert, MD, p. 19.

5 Psalm 23:1-3, NIV.

