

## Five-Minute Stress Relief.com

### The Fight-or-Flight Response

The Fight-or-Flight Response is an instinctive, adaptive mechanism that helps us to quickly react, avoid danger and successfully survive. Today, stress hormones released by the fight-or-flight response cause damaging and deadly reactions in your body. Yet these same powerful stress effects saved our ancestors. How?

Let's say it's 10,000 years ago, and across an open field, you saw a tiger. Immediately your stress response would be to run at top speed to flee death. Instantly you would be able to run faster and farther than you normally could. If a sharp tree branch, or rock, etc. cut your skin as you ran; the stress effects gave your body an elevated ability to form blood clots around the wound to save you from bleeding to death.

Throughout the ages, those people with the best fight-or-flight stress response had the better chance of surviving and reproducing and they became our ancestors. While this stress response is sometimes necessary today, modern-day stress responses occur so often that many of us are in a continual state of stress.

In 1929, Harvard physiologist Walter Cannon first used the term fight-or-flight response. Cannon traced these stress reactions to the release of neurotransmitters (organic chemicals carrying messages throughout the body) from a part of the adrenal glands. Hans Selye extended this research to discover this stress response originates in our brain, and is now scientifically termed the *hypothalamic-pituitary-adrenal* (HPA) system. A chain of biochemical messages is set in motion: the hypothalamus signals the pituitary gland, which releases adrenocorticotrophic hormone (ACTH). This triggers the adrenal glands to release powerful stress hormones. Here are the physiological effects of the primary fight-or-flight stress hormones:

#### Adrenaline Produces These Stress Effects

- Speeds up heart rate, increases cardiac exertion.
- Speeds up breathing rate, increases blood pressure.
- Stimulates the spleen to discharge red and white blood cells, allowing the blood to transport more oxygen to the major muscles for immediate energy.
- Suppresses activity at the front of the brain concerned with short-term memory, concentration, inhibition, and rational thought (hindering the ability to handle complex intellectual tasks).  
Fluids are diverted from nonessential locations, including the mouth, causing dryness and difficulty in talking.

#### Cortisol Produces These Stress Effects

- Provides immediate energy by shutting down digestion and diverting blood to major muscles for instant action.
- Provides long-term energy by mobilizing fats (elevates serum cholesterol levels) in the bloodstream to supply fuel for sustained activity.
- Protects the body from bleeding to death from open wounds by redirecting blood away from skin level, resulting in a cool, clammy, sweaty skin.
- Protects the body from bleeding to death from open wounds by increasing blood clotting in the bloodstream (doubling risk of heart attack).

- Suppresses immune system response, resulting in more exposure to colds, flu, infections, etc.
- Shuts down digestion, causing weight retention.
- Causes fats to mobilize in the bloodstream to supply fuel for sustained activity; when those extra fats are not burned up, they are deposited as extra belly fat on stomach and waistline.
- During chronic stress, provides additional energy by causing the body to burn up lean muscle tissue as fuel, diminishing the body's muscle mass.

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**Sources:** **Wikipedia** (<http://en.wikipedia.org>); **Health Information - National Institutes of Health** (<http://health.nih.gov>); **The Evolution of the Stress Concept**, Selye H. *American Scientist* 61: 692-699, 1979