

Bristlecone Med-fitness

“Damaging truth, I prefer it to advantageous error. Truth heals the pain which perhaps it evokes.” -Goethe

Anxiety: Got GAS?

Stress is the body's internal 'code red;' a reflexive response to pressures that challenge a person's ability to adapt or cope. Rush hour traffic, chronic pain, unhealthy relationships or elevated temperature, each represent a physiological 'alarm.' According to stress pioneer Dr. Hans Selye, the alarm isn't the problem; it's when the alarm is stuck. Chronic stress turns into anxiety, and anxiety is a problem!

In fact, healthy stress will assist a person in improving his performance. The stressor initiates an alert state, the 'fight or flight' of the sympathetic nervous system; stress forces a person to be fully present and focused. A normal level of pre-test anxiety proves effective for most students. However, the stress must have a conclusion; the individual must have a way to retreat from the 'emergency' mode and resume systemic homeostasis within the parasympathetic system. Selye developed a three stage model called *general adaptation syndrome*, or **GAS**, to explain the physiological consequences of chronic stress and anxiety; stage one is *Alarm*, stage two is *Resistance* and stage three is *Exhaustion*.

The *Alarm* stage occurs when the threat or stressor is identified or realized; it is the body's initial alarm. The common 'fight or flight' is the pattern of physiological response that prepares a person for emergency. The sole purpose of the alarm stage is survival. When the alarm is sounded, immediate and powerful changes occur inside the body as the autonomic nervous system (ANS) is activated; the ANS consists of two separate sub-systems: the sympathetic nervous system (SNS) and the parasympathetic nervous system (PNS). The SNS is the part of the ANS that is responsible for the rapid response to stress known as 'fight or flight.' Once a stressor has sounded the alarm, the SNS activates a hormonal cascade in the endocrine system through the hypothalamic-pituitary-adrenal (HPA) axis. This prepares the body for action; during the alarm stage, adrenaline is produced by the adrenal medulla as a first line defense; adrenaline mobilizes free fatty acids from the fat cells for immediate energy. Under normal circumstances, the body is extremely efficient during short periods of stress; most 'alarms' can be deactivated by adrenaline bursts allowing the body to resume homeostasis, a function of the PNS. The alarm phase can be likened to a shift into overdrive; overdrive serves a purpose, but a vehicle is not designed to drive long distances in this gear, it must shift back into drive to protect the motor.

However, during stage two, *Resistance*, the stressor continues and the body is forced to mobilize its internal resources in an all out effort to eliminate the threat, deactivate the alarm, and return to a state of homeostasis. Rather than activating the adrenal medulla for the production of adrenaline, prolonged stress activates the adrenal cortex releasing powerful corticosteroid hormones, especially cortisol. In a sustained 'fight or flight' state, the pre-frontal cortex of the brain via the amygdala (emotional brain), begins to over stimulate the HPA axis in a chronic feedback loop of cortisol; cortisol spills into the hippocampus (logical brain) creating chronic anxiety, panic and racing thoughts. Because the *perception* of a threat still exists, the stress response stays activated at a level which causes hyper-arousal, or '*adrenal overdrive*.' During extended periods of cortisol secretion, muscle is wasted, immunity is reduced, digestion slows, and blood sugar elevates resulting in physical/psychological compromise. During *Resistance*, the body no longer enjoys the adaptive benefits of the 'fight or flight' response (alert/focused), but instead the system becomes maladaptive eliciting the opposite effects (foggy thinking/low concentration).

Finally, in the third stage of *Exhaustion*, all the physical resources are depleted; the body is unable to maintain normal function. If stage three is extended, long term damage may result as the capacity of glands, especially the adrenal gland, and the immune system is exhausted and function is impaired resulting in de-compensation. The result can manifest itself in obvious illnesses such as ulcers, depression, auto-immune disease, cancer, digestive system disturbance, cardiovascular problems, diabetes, as well as other mental illnesses.

Bristlecone Med-fitness

"Damaging truth, I prefer it to advantageous error. Truth heals the pain which perhaps it evokes." -Goethe

Selye recognized that there was a significant genetic variation which determined whether individuals progress through the stages of chronic stress, GAS. In fact, he noted that some people are classified as *'hearty'* and other as *'less hearty'*; the label is determined by a person's inner resilience to threat and his/her ability to 'shut off the alarm.' For those individuals who progress from a healthy stress response into the *Resistance* or *Exhaustion* phase, marked by chronic anxiety, Benzodiazepines are commonly prescribed. Synthetics such as Valium or Xanax work by binding to the gaba receptor in the brain and stimulating an inhibitory response; the drugs lower anxiety through sedation. They can be used either as needed or on a daily basis for the treatment of multiple types of anxiety disorders; Benzodiazepines are meant to be used in the short-term, not as a replacement for psychotherapy.

~Kelly