



Article by Dr. Mary Ann Iyer, MD, MA

Pain: What Does Stress Have To Do With It?

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Have you ever wondered how your response to stress could possibly be linked to your perception of pain? The stress response we each have is hardwired. When we perceive a danger – real or imagined – it starts a bio-chemical cascade that has inevitable consequences.

An initial recognition of a problem is a cognitive event: “This is going to hurt.” “He hates me.” “I’m not going to get what I want.” The brain cortex, where all this thinking is going on, is connected directly to the hypothalamus, which sits at the base of the brain. This small area is an amazing crossroads of incoming (via thoughts/perceptions of the external world) and outgoing (via the chemical milieu of the body) data. When stimulated by the perception of danger – i.e. stress – it does several key things. One of its important functions is to prepare the sympathetic nervous system for potential immediate action – the well-known “fight or flight response”.

As part of the autonomic nervous system, these nerve pathways directly cause heartbeat and breathing rate to increase without our consciously thinking about it. The sympathetic nervous system also innervates the adrenal medulla, a small gland on top of the kidneys, and causes the release of catecholamines. The most commonly recognized of these hormones is epinephrine, or adrenaline. These hormones also act vigorously on the cardiovascular system, driving up both heart rate and blood pressure.

Finally, the sympathetic nervous system acts on our musculoskeletal apparatus, increasing muscle tension and rigidity in preparation for immediate action. Short term, when appropriate, this can save our life. We are maximally prepared and alert when the adrenaline level is high. (Caffeine is in the same family, chemically speaking as these hormones. Try functioning decaffeinated if you’re a coffee addict.) However, as an extreme, chronic state, continued muscle tension creates or worsens already present pain fairly dramatically. Tension headaches, low back pain, fibromyalgia – really any pain is made worse by chronic tension.

So what can this mean in a pragmatic way? Once the biochemical and neural pathways are incited, it takes external help to interrupt the cycle – or a focused mental effort on our part. If, however, we realize what thoughts we’ve been shoveling to the hypothalamus to start with, we have a very important tool for change. In fact, we can go so far as to manufacture our own brain “morphine” – endorphins.

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