

# What is the Brain's "C-HPA Axis"?

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What is the brain's C-HPA Axis and why is it significant? It is significant because, what we think, what we feel, *even if it is not true*, profoundly affects our body chemistry and can lead us either to health – or to illness. It is often said: "The mind is a powerful thing". Very true words - especially when viewed through the lens of physiology.

Let's start with a little anatomy first (I urge you to read this more than once). Evolutionarily and embryologically speaking, the first neurological structure to appear is the notochord, which develops into the spinal cord and spine. This is the most primitive of nerve tissues and relays electrochemical signals back and forth between the body and the various parts of the brain, via the peripheral nervous system. The spinal cord and the brain compose the central nervous system.

At the top of the spinal cord there is an enlargement called the Medulla, which is responsible for basic functions like heart rate and breathing, as well as the coughing, gagging and sucking reflexes. To the rear is the lemon-sized Cerebellum which smoothly coordinates complex body movements. Above these sit the olive-sized Pons, and the Midbrain, in control of eye movements, balance, facial sensation, facial expression and salivation and taste.

Above these structures, like a pair of walnuts, sits the Thalamus. The Thalamus is part of the subconscious Limbic system, comprised also of the Hippocampus and Amygdala, for the formation of long-term memory, and finally, the Hypothalamus, meaning "under-thalamus", which directs the Pituitary gland to release the hormones on cue that signal distant glands governing the function of our organs and global physiology. Two of those are the Adrenal glands sitting atop the kidneys – more on the Adrenals in a moment.

The Limbic system is where all our primitive drives originate: hunger, thirst, lust, rage, fear. In short: self-preservation. It is where, in my opinion, "the action is!" and it is the Thalamus that unifies the 'subconscious' Limbic system with the 'conscious' Cerebral Cortex, the "aware" part of the brain; the last part to evolve and develop; it is here where we plan the future, solve problems, make decisions and execute purposeful motor movements. It is where we consciously experience our bodies and the entire world through all our sensations such as taste, touch, vision and smell, and also intuitive awareness.

With that groundwork laid in we can approach the significance of the C-HPA Axis and its influence on our health -- or lack of it. The "C" stands for the 'conscious' Cerebral Cortex, the "HPA" stand for the 'subconscious' Hypothalamus, Pituitary gland and the Adrenal glands, and they work together in a very special way. Let us continue with a classic illustration: A mother sees her child pinned under the wheel of a car and without thinking she rushes over and summons the strength to lift the end of the car to rescue her child. We call this the "Fight or Flight" response.

What has happened here, physiologically? The visual input from the Cortex of the child pinned under the wheel is relayed to the limbic system generating a powerful fear/protection response; the Hypothalamus fires the Pituitary to release a stimulating hormone to the Adrenal glands to secrete cortisol and, through another pathway, Adrenaline. This combination gives the mother extraordinary strength. The child is saved.

But there is more to this. In addition to the strength the mother derived from the emergent chemical bombardment, her blood pressure went sky-high, she dumped huge amounts of sugar into her veins, her

sensitivity to pain was greatly reduced, and her digestive, reproductive and immune systems shut down, all in an effort to conserve vital energy for the task at hand.

Now, here is the problem: the very powerful, survival-based Limbic system is not conscious or rational. It behaves in a very basic, child-like way. It doesn't know when an emergency is real or not or if there is present danger. To illustrate this let's take another example: A person has, in the past, been awfully abused for a long period of time and because of this carries a great amount of resentment, fear and anger throughout their life, the vivid memory of which can be re-ignited by a mere smell, a sound, an image, even a song. The emotional state created by this memory and present state of mind is in the same way relayed to the Limbic system as if it were actually happening NOW and the same physiological responses ensue; not for a minute, not for an hour or a day or even a month – but for months or years or decades!

The long-term, unrelenting stresses break the body and thus our health is broken, and this is the significance of the C-HPA Axis. Not all face such a severe situation, yet it is important to know that there are many components necessary to our health: good clean food and water, good sleep and enough of it, healthy productive movement, an aspect of spiritual life sought, and a peace of mind achieved through absolution, forgiveness or both. Therapy or a trusted spiritual advisor can be of critical help in this as well.

Understand that we are, more than we know, the physical products of our thoughts. Blessings to all.

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