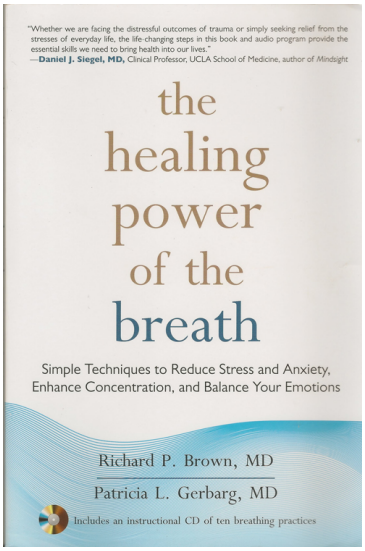
Hello all,

Welcome to ***We Call It Breathing***, Volume 1, Issue 3 of Alternativz, an *occasional* journal of complementary and alternative solutions for health, well-being, performance, and longevity. But first, I'm pleased to announce the availability of Drs. Brown and Gerbarg's new book ***The Healing Power Of The Breath***, a Shambhala publication. I'm very pleased to have been a part of the project. You can find it here.



Paraphrasing Webster's unabridged dictionary - Breathing: "The act of a human or other animal that breathes." Also, "respiration". Most of us think of breathing as the movement of air in and out of our bodies. Respiratory scientists and professionals tend to think of it as the exchange of blood gases oxygen and carbon dioxide. I'd like for us to begin to think of "breathing" in a different way – ***as diaphragm movement***. Why? Because these other ways of thinking about it limit our comprehension of the crucial role that breathing plays in our lives.

In this light, Coherent Breathing equals relatively slow, deep, rhythmic, *diaphragm movement* – if monitored, diaphragm movement that facilitates pulmonary/circulatory resonance – synchrony of respiration, blood flow, and heart rate. Click here to view what this synchrony looks like.

In fact, in addition to moving air in and out of our lungs, diaphragm movement is a fundamental mediator of multiple systems including the circulatory system, the autonomic nervous system, and the enteric nervous system, and these are just the systems that we know of.

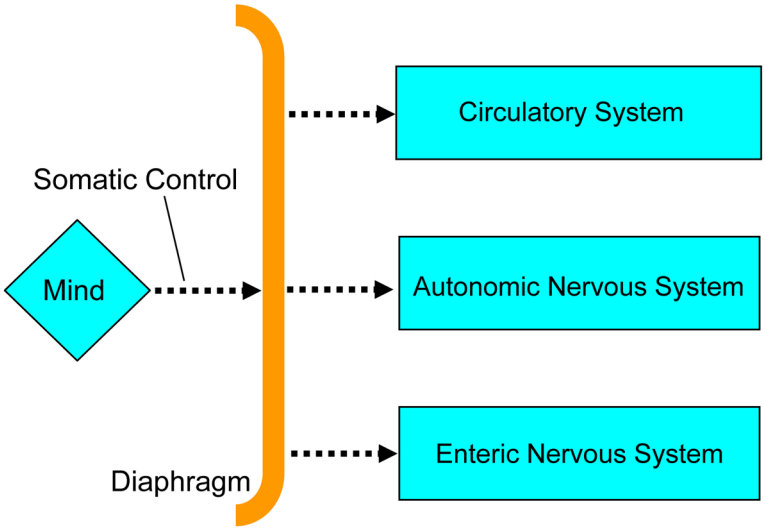


Figure 1: The Diaphragm Mediates Multiple Systems

When we raise the diaphragm, blood flow in the arterial tree rises, when we lower the diaphragm, blood flow in the venous tree rises.

When we raise the diaphragm, autonomic action swings toward parasympathetic (slowing and relaxing) emphasis. When we lower the diaphragm it swings toward sympathetic (quickening/tensing) action. The heart rate decreases and increases, respectively.

When we raise the diaphragm, the enteric nervous system (of the gut) becomes active. When we lower the diaphragm, it slows.

This mediation occurs both "informationally", i.e. via programming of the central nervous system and mechanically, via changing volume and pressure of both thoracic and abdominal cavities as the diaphragm moves up and down.

Figure 2 demonstrates the elegant coordination of informational and mechanical actions relative to thoracic and abdominal cavities, housing the heart/lungs and gut respectively. When the diaphragm rises, pressure in the thoracic cavity increases pushing blood out of the lungs where it had accumulated during inhalation. Blood in the arterial tree rises. Information is conveyed to the heart via secretion of neurotransmitter acetylcholine by the vagus nerve telling it to slow down.

Not only does it slow down, the blood volume carried by each heart beat increases, aiding mechanical pressure in evacuating the lungs of blood. The opposite occurs during inhalation, i.e. the diaphragm moves down, pressure in the thoracic cavity decreases drawing blood through the venous tree, secretion of acetylcholine by the vagus nerve decreases and heart rate speeds up, the right heart shuttling blood into the lungs as pressure decreases.

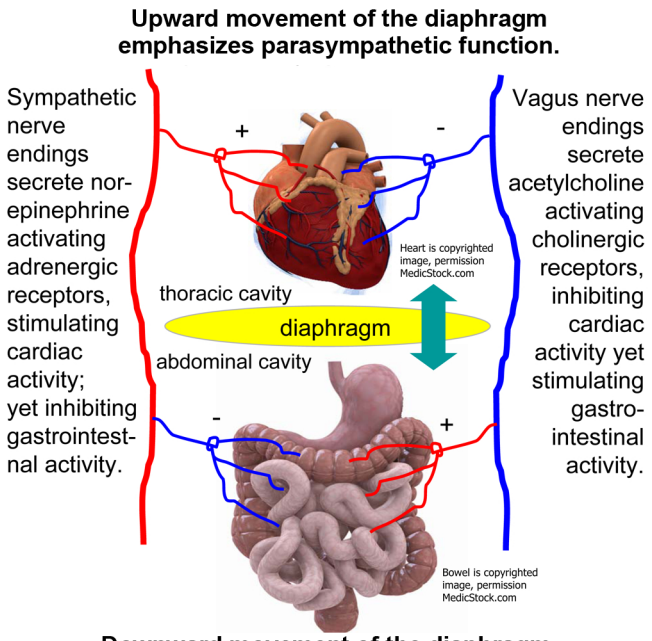


Figure 2: Informational and mechanical synchrony of thoracic and adbominal action

Diaphragm action mediates functions of the abdominal cavity similarly, but opposite that of the thoracic cavity. In this case, as the diaphragm moves upward, the enteric nervous system is stimulated by secretion of acetylcholine by the vagus nerve, the same secretion that slowed heart rate. The enteric nervous system gets busy with complex process of digestion. When the diaphragm moves downward, decreased acetylcholine slows the action of the enteric nervous system, allowing the gut to take advantage of increased abdominal pressure. So when the diaphragm moves upward the enteric nervous system gets busy, when the diaphragm moves downward it slows, taking full advantage of the motive force of increased pressure to move matter through the intestinal tract. This combined mechanical and informational mediation makes sense because the body is organized optimally – in such a way so as to take full advantage of physics to achieve efficiency.

The diaphragm has a maximal range of movement of ~10 centimeters. Like other "bridges", it's movement is controlled both "unconsciously" via central nervous function, as it is during hard work or exercise, and consciously via the convenience of somatic governance. Most adults use about 10% of this range during normal daily life. This is simply inadequate for health and well-being. Whether we choose to move the diaphragm consciously, unconsciously, or both, for the body/mind to function properly it is critical that we do so.

Thank you for your interest,

Stephen Elliott - COHERENCE

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