COHERENT BREATHING®

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Hello all,

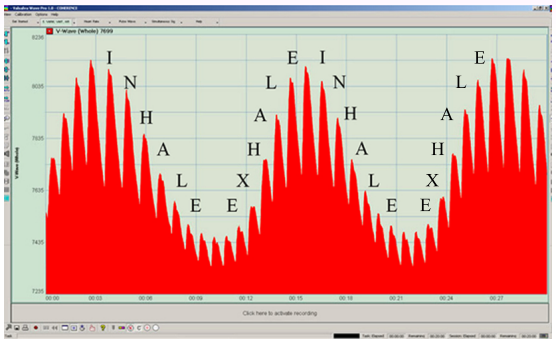

Figure 1: The Valsalva Wave Observed At The Earlobe. The Wave In The Brain Observed Via HEG Is Virtually Indentical To That Observed At The Earlobe.

Welcome to Volume 2, Issue 1 Of *Coherent Breathing*: Knowledge Of The Wave In The Brain Changes Everything! *Medical Physiology* (10th Edition) by Guyton & Hall is a treasure trove of vitally important information about any and all aspects of human physiology. It is an incredible work that I have relied on heavily for many years and I encourage my readers to have it in their library.

The introduction of Chapter 37, Pulmonary Ventilation, enumerates 4 major biological functions of respiration: 1) pulmonary ventilation, the movement of air in and out of the lungs, 2) the transfer of oxygen and carbon dioxide between the alveoli of the lungs and the blood, 3) *the transport of gases in the blood and body fluids to and from the cells,* and 4) regulation of ventilation, i.e. management of breathing rate and depth so as to satisfy the body's need for gas exchange. This refers to the ramp signals generated in the brain stem that stimulate the diaphragm to flex and to relax resulting in inhalation and exhalation in response to the body's demand for gas exchange.

If you are familiar with my writing, you may already understand the fundamental principle of Coherent Breathing is that "breathing" can be learned and that learning to breathe with depth and rhythmicity, i.e. "coherently" is imperative for healthful circulation of blood and of all body fluids, which depend on the circulation of blood to support the milieu interieur in which the vast majority of living cells exist. The reason it is imperative is that humans are erect, i.e. we carry our legs below our chest and our head above our chest when we are upright. Here I argue that the diaphragm and control thereof evolved with erectness in all mammalian life, with the evolutionary imperative of facilitating blood flow from the legs during inhalation and to the brain during exhalation against gravity. Clearly the brain and its control of breathing also evolved, otherwise we couldn't function properly when we stand up. This fundamental hypothesis is borne out by the giraffe, which literally could not exist were it not for its massive diaphragm – the largest of any land dwelling vertebrate – the giraffe heart alone cannot move blood to its head. The evolutionary purpose of the giraffe's massive diaphragm is to generate powerful wave action that aids it's heart in bringing blood from its legs and sending blood to and from its head and brain. If we look at blood activity in the giraffe head, all that is visible is breathing induced blood waves, the heartbeat is barely visible. The same breathing induced wave action exists in the human head. My colleagues and I named this wholistic wave in humans, "The Valsalva Wave".

Medical Physiology goes on to say that blood flow through the lungs is proportional to cardiac output and therefore pulmonary circulation is controlled by the same factors that control cardiac output (Page 445). Note that this sentence presumes autonomic control of breathing. However, a bit later (Page 481) the authors go on to say that research suggests that control of ventilatory response, i.e. control of the diaphragm is "learned" and probably involves higher centers in the brain including the cerebral cortex. Here we might wonder, learned to what advantage? Clearly learning to hold the breath is necessary for survival, but what other advantage is there in "learned breathing"?

The giraffe could not exist without employing its diaphragm, whether it is automatic, conscious, or both. I make the same argument about humanity, the diaphragm we possess evolved to allow us to function while erect, and our brains evolved along with it to afford us subtle control. Giraffe and human are much alike in this regard. It is a matter of degree. The physiology that we share is verticality and a strong diaphragm and the powerful wave action it induces in the circulatory system when used. When we observe blood activity in the giraffe head, all that is visible is the breathing induced wave. When we observe blood action in the human brain *when we are not* employing the diaphragm with significance, all we see is the heartbeat – the breathing induced wave is all but absent. The moment Coherent Breathing begins the Valsalva Wave appears (as observed with wideband HEG) and along with it giant electrical wave activity (as observed via wideband EEG). I leave you with this...

Without employing its diaphragm with significance, the giraffe will perish due to lack of blood flow to its brain. What of the wave in humans? Is the Valsalva Wave necessary for the human brain and mind to function optimally?

Stephen Elliott, President, COHERENCE LLC

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