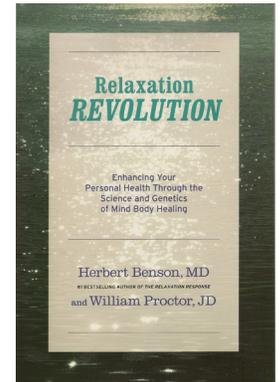


*Hello all,*

Welcome to the 2011 *Coherence Newsletter* series. I hope everyone had a peaceful holiday season. In December, I reviewed Herbert Benson's most recent book, *Relaxation Revolution*, where he and William Proctor describe their ground breaking research into mind body practice and gene expression. In a nutshell, their findings are that ~4% of genes tend to express differently in those who practice mind body methods. Genes that make up this 4% tend to express "negatively" in a normal healthy population – leading to disease and aging; conversely, the same genes tend to express "positively" in practitioners of mind body methods – leading to healthful outcomes. Behind the book is research that represents a huge step in bridging the gap between age old wisdom and 21st century scientific understanding! We're very pleased to add it to the COHERENCE bookshelf where you'll receive *The Six Bridges CD* – FREE! with purchase.

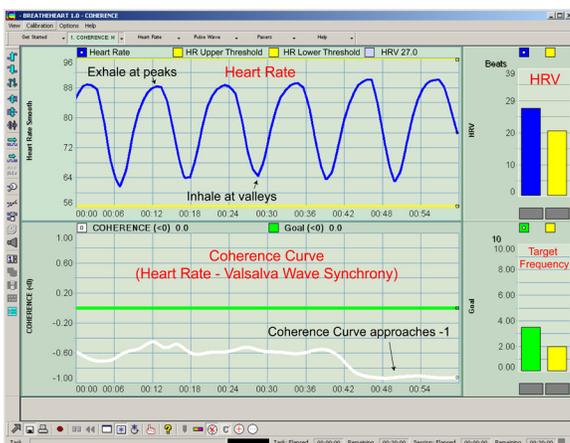


This month's newsletter is titled *Coherent Breathing - The State Of The Art*, where I hope to provide a thumbnail perspective on the science of Coherent Breathing, significant technological advancements and where we're headed. I'm pleased to report that many of the ideas put forward six years ago in *The New Science of Breath* continue to be confirmed and validated regularly by others.

First I'd like to consider the essential methods by which one might elicit autonomic balance, cardiopulmonary resonance, and psychophysiological coherence. In *The New Science of Breath* it's explained that there are two methods for doing this: 1) by monitoring the heart rate and consciously synchronizing the breath with heart rate peaks and valleys (you may recall that I proposed that this is the essential purpose of Yoni Mudra) and, 2) by breathing at the frequency of resonance, nominally 5 breaths per minute, with equal periods of inhalation and exhalation and appropriate depth.

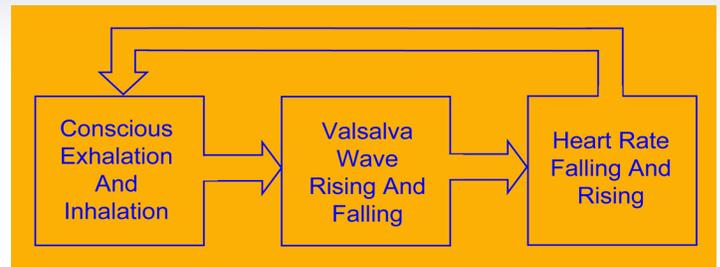
Since then, the primary focus has been the second method, supported by RESPIRE-1 and other pacing products. With the advent of *BreatheHeart*, a.k.a. "electronic Yoni Mudra", the first Coherent Breathing instrument optimized for clinicians and their clients, we now have the means by which we can monitor and train multiple dimensions of heart rate, which we know to be a key indicator of breathing effectiveness, circulatory efficacy, and internal status.

Built on the foundation of the research instrument *Valsalva Wave Pro*, BreatheHeart presents a single screen that facilitates the Coherent Breathing training protocol including heart rate smoothness and regularity, variability (HRV), target frequency power, and coherence, where "coherence" is a measure of the synchrony between the heart rate and its impetus, the Valsalva Wave. This is a broad measure of psycho-physiological coherence that is based on phase correlation of the heart rate with the Valsalva Wave.



Because breathing induced heart rate variability is primarily an outcome of real time autonomic governance of changes in blood flow and pressure as a function of breathing, by employing the heart rate as the reference rhythm we are aligning our conscious intention with the real time perspective of the autonomic nervous system - they are in perfect harmony. Breathing with the heart rate

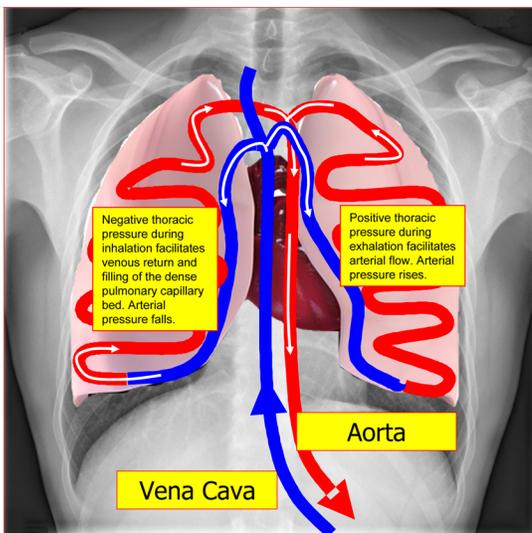
as the reference also accounts for variation in autonomic status as occurs with time of day, digestion, etc. When we practice in this way, it speeds comprehension, improves learning, and reduces practice time. The potency can also be observed in other biometrics where favorable changes can be seen to occur even more rapidly than with optimal paced breathing alone.



By Synchronizing Breathing With The Heart Rate We Are Aligning With The Real Time Autonomic Perspective

As space is already running short, I'll limit my discussion to one additional area of critical significance and future focus, this being the relationship between breathing, heart rate variability, and blood pressure. In the 2007-2009 time frame, **Dee Edmonson, R.N.**, and I undertook a project to understand the correlation between breathing induced heart rate variability and blood pressure, the hypothesis being that significant HRV and hypertension are mutually exclusive, the reason being that the physiological conditions that facilitate one thwart the other. The theoretical basis was this - for breathing induced HRV to be high, arterial capacity must increase and decrease during exhalation and inhalation, respectively, and if arterial capacity is increasing and decreasing significantly, then net blood pressure cannot be high. The results of the study are supportive of the hypothesis where we found no cases where average blood pressure exceeded 100mmHg and HRV was >13 beats. You can read more about the study in the **March 2010 COHERENCE Newsletter.**

But, while arterial capacity and the volume of blood moved by the heart ultimately determine arterial pressure, I don't believe this to be the causative factor in essential hypertension, *essential* hypertension (of unknown cause) accounting for 95% of all cases.



Its already known that inhalation causes arterial pressure to fall instantly due to accumulation of blood in the dense pulmonary capillary bed and reduced outflow to the left heart. But I believe there is also a longer term cause and effect relationship - that excessive *positive* arterial pressure is ultimately rooted in insufficient *negative* venous pressure, insufficient venous pressure being an outcome of insufficient inhalation, insufficient inhalation ultimately failing to result in adequate negative thoracic pressure, inadequate negative pressure failing to motivate blood in the vena cava to return to the lungs. In this case, the right heart must *work* to “vacuum” blood back to the lungs. (Its interesting to note that because of the subtle pressures involved in the venous system, increased blood volume due to sodium levels would compound this problem.) Ultimately, I believe that this has a ripple effect on the left heart

as well, i.e. if due to insufficient inhalation the lungs do not present the left heart with an adequate blood volume, the left heart must work to pull blood from the lungs and then push it into the aorta, all of this “extra” work resulting in cardiovascular strain in an effort to maintain viable circulation. *The notion is that the lungs, under control of the diaphragm, can facilitate or impede circulation.* When the lungs impede vs. support circulation, systemic pressure rises. This is the hypothesis and a key area of focus in 2011. I'll be discussing it again later in the year.

Thank you for your interest and consideration, Stephen Elliott

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