



Hello all,

Welcome to Coherent Breathing, Volume 2, Issue 6: *How Did We End Up Here?* I start by referring to Figures 1 and 2 below, where I ask: Can you discern the difference? If you can, you are in the minority. I say this based upon my dialogue with doctors of various disciplines during our research for *Coherent Breathing - The Definitive Method* (2008), where I found that doctors and medical school professors did not know about the phenomenon of the respiratory arterial pressure wave, or the role that breathing plays in the movement of blood.

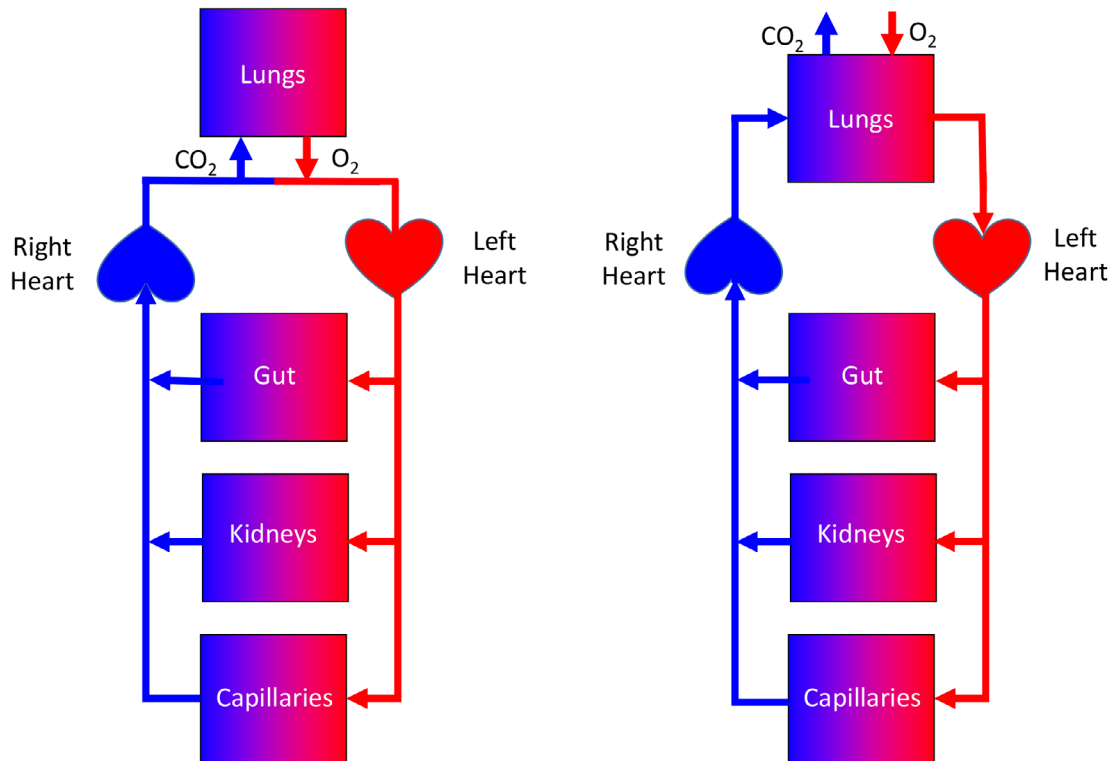


Figure 1:

Medical Physiology, chapter 1, page 3,

Figure 1-1. "General organization of the circulatory system"

Figure 2:

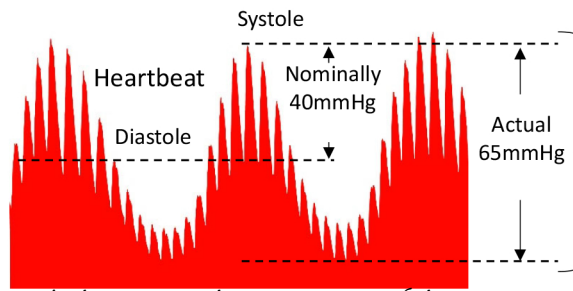
My critique and correction

Figure 1 above is my rendition of Figure 1-1 from my "bible of physiology", this being the monumental work of Drs. Arthur Guyton and John Hall, written during their tenure at the University of Mississippi, School of Medicine and Bio-Physics. *Medical Physiology* is the most widely published text on the subject, having been translated into many languages the world over with millions of copies in the hands of doctors and medical students. I point to Figure 1-1 of this book as the prevailing conceptual understanding of the relationship between the lungs and the circulatory system – that the lungs are peripherally associated with blood flow. I offer Figure 2, as a correction to this understanding – the lungs are an integral part of the circulatory system, all of the blood in the body flowing to and through them just as blood flows to and through the heart. *Breathing is a circulatory function!*

I submit that the general understanding of the circulatory system as put forward by Figure 1-1 is alive and well in the minds of the medical profession and the public at large. I believe this conceptual understanding has blinded us to the reality that breathing regulates our blood flow and ultimately our blood pressure. So, here I must conclude that Figure 1-1 is meant as a *gross* generalization, as it is clearly understood that blood flows from the right ventricle to the lungs and from the lungs to the left atrium, i.e., there is a closed loop of blood flow between the heart and lungs. But, I posit that somehow the conceptual understanding as conveyed by Figure 1-1 has become rooted in the common understanding. How this can be, I don't know and can only offer conjecture.



I hope that our efforts of the past 20 years have helped to push the correct understanding along, and alas, I do see a ray of hope. This glimmer comes not from the medical profession per se, but from medical instrument manufacturers, where I know of at least 2 global giants, Omron and General Electric that have incorporated the detection of the respiratory arterial pressure wave into their oscillometric blood pressure measurement instruments. In other words, if we breathe with depth and rhythmicity while we are having our blood pressure assessed with these instruments, we see that the systolic and diastolic readings are those of the peaks and valleys of the wholistic respiratory arterial pressure wave, e.g. 122/57 (See Figure 3), whereas previous instruments ignored breathing induced peaks and valleys in blood pressure, and hence, neither doctors nor their patients could see or understand this critical factor affecting their blood pressure (and their circulatory health in general).



Plethysmographic detection of the respiratory arterial pressure wave theorizing 70mmHg between systole and diastole.
COHERENCE Valsalva Wave Pro



Mean Arterial Pressure During Measurement Period (Sys+Dia)/2, "Normal" =100

Figure 3: GE DINAMAP Pro 400 V2 Blood Pressure Monitor demonstrating 65 mmHg between systole and diastole vs. 40mmHg. Mean arterial pressure demonstrating 83mmHg. vs. 100mmHg.

Interestingly, in 2008 COHERENCE was awarded US patent 7458937 (filed January 2005) for assessing breathing effectiveness via oscillometric detection of blood pressure, after which I approached both Omron and GE to interest them in incorporating this fundamental advantage into their oscillometric blood pressure instruments. Not surprisingly, I ran into a stone wall with both and ultimately let the patent expire because I could not afford to participate in this instrument space due to FDA regulations, which at that time had a starting price of \$10M.

In previous articles I've explained how low-frequency filtering came to be standardized and embedded in EEG instrumentation, this being the doing of Elmer and Alyce Green, pioneers in EEG biofeedback. It was implemented in EEG in order to eliminate what they termed "unwanted physiologic noise", preventing it from interfering with the much lower amplitude functional brainwave bands: beta, alpha, theta, and delta, where the general problem was that breathing induces brainwave signals that are 10 times larger than functional bands, and therefore obscures them from view. Colleagues and I have determined that these 10X brainwaves occur when the respiratory arterial pressure wave rises and falls in the brain, where I personally believe that many of the advantages of Coherent Breathing accrue from this wholistic arterial/venous wave washing through the brain with every breath. We have also determined that desirable functional brainwave patterns are dependent on breathing.

Relative to oscillometric blood pressure measurement, the same thing happened, i.e., low frequency filtering was implemented. Had it not been – as far back as the advent of GE's DINAMAP (1976) – nearly 50 years ago now, oscillometric measurement would have told us about the relationship between breathing and blood pressure. Instead, approximately 60% of the global adult population presently suffers from essential hypertension: "elevated arterial pressure with no known etiology". But not for much longer now. As new doctors and more importantly, new users, become familiar with these contemporary blood pressure measurement instruments the truth will become self-evident. I consider this a victory in my quest to expose the underlying physiologic fact that sub-optimal breathing results in essential hypertension – "elevated arterial pressure – *now with verifiable etiology*".

Stephen Elliott, President, COHERENCE LLC

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