



Hello all,

Welcome to Coherent Breathing®, Volume 3, Issue 6: *Catching The Wave*. I hope you enjoyed Volume 3, Issue 5: *My Treatise On Tai Chi, Breathing, and Esoterica*.

I have the opportunity to address many questions during a typical week. Most end up with me returning to the explanation that resonant breathing generates a wave in the circulatory system, and it is this wave that yields the benefit. Our goal is to breathe so as to generate this wave. In Coherent Breathing parlance, this wholistic wave is referred to as *The Valsalva Wave*.



Figure 1: Catch The Wave

The wave is created by cyclic, rhythmic action of the diaphragm. It can occur at any breathing rate as long as diaphragm motion is both cyclic and rhythmic, i.e., unbroken rhythmicity. If the action becomes arrhythmic, the wave decays and falls apart. The sinewave is the perfect analogy for the wave we desire to generate using conscious control that we have over the diaphragm and muscles of breathing.

Interestingly, we can feel the Valsalva Wave action in the body, just as if we're standing in the surf and can feel the ebb, the pull of the water on the body after a wave breaks on a beach and the water rushes back out, and the flow, the push of the water on the body as a wave rushes in. That same ebb and flow is going on inside the body when we inhale and exhale in a resonant, "coherent", wavelike manner. To bring this sense squarely into our interoceptive field of view, lets try this:

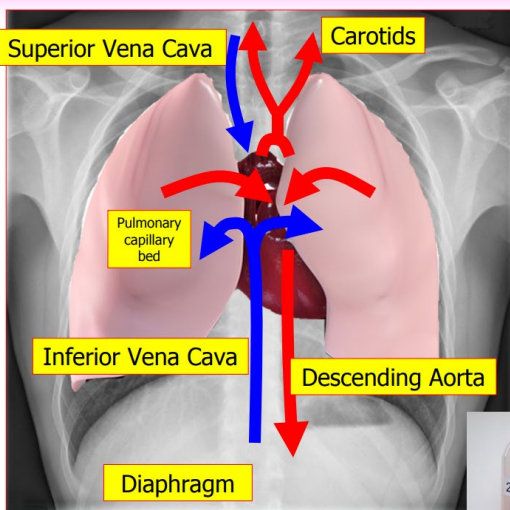
- 1) Sit comfortably with eyes *gently* closed. *Allow gravity to close them - no effort.*
- 2) Inhale comfortably to a count of 6 seconds.
- 3) At the end of inhalation, relax and let the exhalation proceed.

We want to experience what our bodily sensations are like during each phase – we want to use our interoception. So, let's try it again, sensing our *internal* experience during inhalation...try it a few times, paying strict attention to inhalation alone, until we have good sense of what it feels like. Eyes should be *gently* closed because

this frees up the visual cortex, the part of the brain that requires the most energy. Freeing the visual cortex from its task of vision enhances interoception, allowing other parts of the brain to step up their involvement, thereby enhancing other senses including those we perceive internally.

For this particular experience it is important to both inhale and exhale through the nose. Why? Because the nasal turbinates of the nose govern the flow of air in real time. This is an explicit function of the nose, to modulate flows and pressures as the lungs inflate and deflate.

Can you describe what you feel during inhalation? Use the lines below to make some notes if you wish:



Anatomy is simplified for purposes of illustration
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Please try it few more times, paying particular attention to the face, hands, and feet. What do we feel?



When I inhale, I feel a slight vacuum occurring throughout the body, particularly, the face, hands, and feet (really, all of the bridges). This is in-fact the case, there is a “relatively negative-going change in pressure” inside the body, including the skin, when we inhale with depth. I sense my nose, regulating the flow. Notice that the nose governs how fast air can enter the body and inflate the lungs. In fact, the downward motion of the diaphragm is causing this inward flow of air by causing the lungs to expand and thereby causing the pressure in the lungs to be below the air pressure of the external environment. Consequently, air flows from the higher pressure external environ to the lower pressure internal environ.

Students may be familiar with “the thoracic pump” (Figure 2), a term I coined to describe the circulatory function of the diaphragm, lungs, and chest. The fundamental motive force for both venous and arterial blood is the diaphragm, generating negative pressure in the venous tree as it moves down, and positive pressure in the arterial tree as it moves up. The compliance and elasticity of the lungs filling and emptying of both air and blood is the literal pumping mechanism. The diaphragm is the primary muscular motive force.

Per Figure 2, inhalation fills the lungs with blood by drawing it from venous tree and through the right heart via the pulmonary arteries. The heart rate speeds up to shuttle the large volume of blood being drawn through the right heart under extremely low pressure. Blood and air meet across the extremely thin alveolar surface of the lungs, exchanging CO₂ for O₂. The average adult has 5L of blood in the body – virtually all of it flowing in a circle from lungs to heart, to arterial tree, throughout the 25,000 miles of capillary circulation in the typical adult body, back to the venous tree, the right heart, and into the lungs again. The 5L of blood flows in this circle all the time, its job being hydrating, nourishing, and cleansing, the trillions of cells floating in the remaining 37L of fluid that exists in the average adult body, 42L in full. The rate and continuity at which this 5L flows is critically important to health and well-being. It is the reason why Coherent Breathing “works”. Generation of the Valsalva Wave is the indication that blood is flowing in a circle as it should be. ***Breathing is a circulatory function.***

Turning now to exhalation...what do we feel?

I sense the negative pressure throughout the body gradually switching to positive pressure. Detecting this is really the central topic of this article, *catching the wave*, riding it. But, there is something else to do in parallel, this being to relax. Here we are literally facilitating the relaxation of the smooth muscle of the arterial tree, allowing the arterial blood to flow as freely as possible. I was reminded that this is a uniqueness of the Coherent Breathing method and protocol – deep relaxation coincident with exhalation. Readers may recall that inhalation is “sympathetic” in nature, and exhalation is “parasympathetic” in nature. Conscious relaxation during exhalation accentuates the parasympathetic response. We can sense it, and we can see it if instrumented. ***The Six Bridges*** practice is about cultivation of this deep relaxation response during exhalation, *letting it all go* – on the inside.

So, let’s switch to the experience of the exhalation. Here we do the same thing as with inhalation:

- 1) Sit comfortably with eyes *gently* closed, allowing gravity close them, no muscle contraction involved.
- 2) Inhale comfortably to a count of 6 seconds.
- 3) At the end of inhalation, *relax deeply* and let the exhalation proceed for the same count of 6 seconds.

What do we sense during exhalation? Can you feel the wave of positive pressure advancing from chest throughout the body? Here again, pay close attention to the face, hands, and feet, or all *six bridges* if one has knowledge of this matter. Instead of sensing negative pressure, a vacuum, we sense positive pressure, and a certain tingling.

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I wrote a newsletter with this same title, *Catching The Wave*, in 2009. You can find it on the COHERENCE Compendium. Search for “catching the wave”.