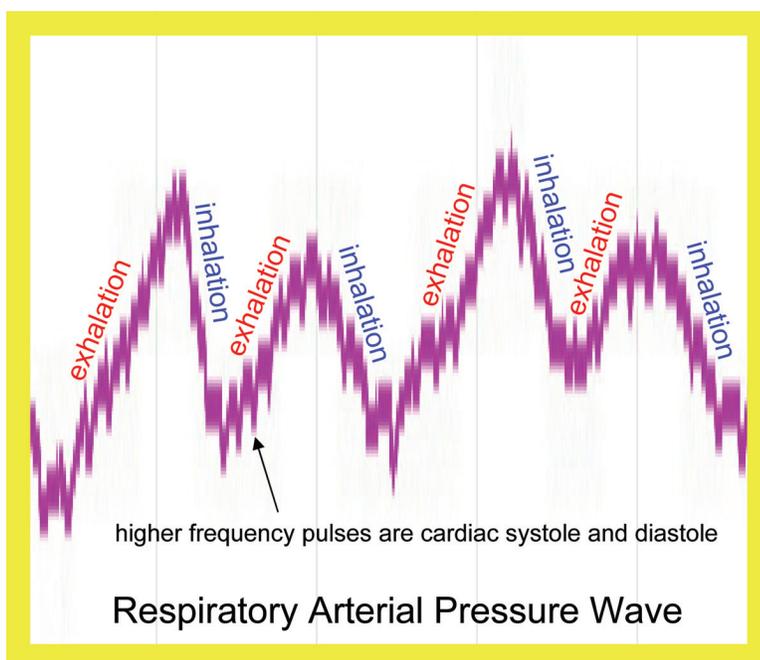


Dear Reader,

Welcome to the January edition of the *COHERENCE Newsletter*. Before we jump in, noted therapist and performance coach, Rae Tattenbaum (inner-act.com), was on Fox-TV Channel 61 in Hartford, Connecticut, a couple of weeks ago. The focus of the program was on helping children manage the stressors of the economy. You can view the program [here](#). Also, Drs. Richard Brown, Pat Gerbarg, and Philip Muskin's new book *How To Use Herbs, Nutrients, and Yoga in Mental Health* is now available. I'm sure that many of you will find it of great interest. Lastly, I received a couple of questions and comments from last month's newsletter (thank you), *What Is Snoring And Why Do We Do It?*, where I hypothesized that snoring is a means by which the autonomic nervous system promotes circulation while we sleep. I offer answers to these questions toward the end of this newsletter.

This month's topic is "*Catching The Wave*", where I offer an *exercise* in cultivating the phenomenon known as the *respiratory arterial pressure wave (RAPWave)*. The figure to the right is a actual measurement of this wave as observed in the index finger during 4 cycles of *Coherent Breathing*. It was captured using an experimental DC coupled optical plethysmograph. The rising edge of the wave occurs as the finger fills with blood during exhalation, the falling edge is the finger emptying of blood during inhalation. The smaller pulses are the heartbeat, where there are nominally 14-15 beats/cycle.

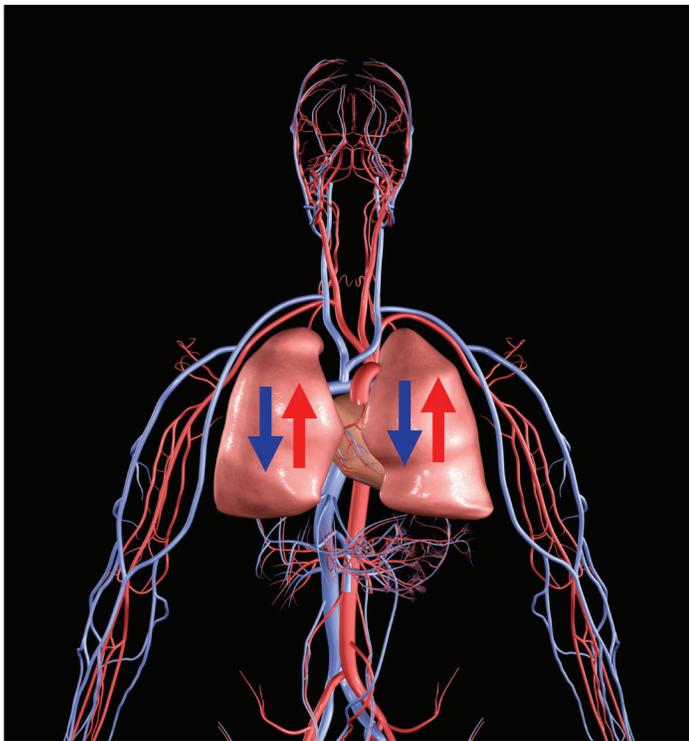


The Respiratory Arterial Pressure Wave
Depicting 4 Breathing Cycles

[Note that it is slightly incomplete to refer to it as the "arterial" pressure wave because that only describes its arterial aspect. During inhalation, there is a wave that is equal in volume yet lower in pressure that occurs in the venous system. In this way, each time we inhale and exhale "coherently", a wave washes through the circulatory system, from the lungs to the extremities and back again.]

A goal of Coherent Breathing is to "cultivate" this wave action in the vascular system. So, how do we go about it? Well, if you're practicing *Coherent Breathing*, you're already doing it, at least to

some degree. What I hope to show you here is how to “feel it”. Once you feel it, it will become easier and



Cardiovascular System Depicting Lungs Filling With Blood During Inhalation and Emptying of Blood During Exhalation

easier to perfect the practice. Note that “feeling” is a form of biofeedback, one that we carry with us all the time! Alright, lets begin. [Please rest assured that while subtle, the exercise is extremely simple.]

1) First, assume a comfortable position where it is possible to relax your arms, legs, or both.

2) Begin breathing “coherently”. Continue breathing for a few minutes. Within a short time we’ll feel the muscles in our body wanting to “let go”. Often, this is felt in the face first.

3) Go ahead and continue breathing, and as we do, begin consciously “letting go” each time we exhale. Feel the relaxation in your hands and feet.

4) Now, once we’re comfortable and relaxed, as we inhale, pay close attention to *how much* air we are inhaling. Also, notice *how long* it takes to inhale fully. Develop a sense for the *volume* of air that enters your chest. Work with this idea for a short time until you get a sense of it.

Next we’ll shift our attention to the blood...First, we want to recognize that while blood circulates continuously, when we breathe slowly and deeply, venous blood flow accelerates during inhalation and arterial blood flow accelerates during exhalation, filling and emptying the lung’s dense pulmonary capillary bed with each respiratory cycle.

5) Continue breathing coherently...As we do, imagine that a volume of blood *equal to* the volume of air enters your lungs each time you inhale. [In actuality its about 25% as much, but for this practice we want to “sense” the volumes as being equal.] Try to feel the presence of this volume of blood in the chest, like a water balloon filling.

6) When we exhale, our goal is to allow the lungs to empty of blood fully and freely. Mostly, this requires that we “get out of the way” and learn to let exhalation occur of its own accord. Again, the notion of a water balloon is useful - let the balloon’s elasticity do the work.

7) Now, the crescendo....With arms and or legs relaxed, as we exhale, we want to sense the wave of blood exiting the chest and entering the hands and feet. Work on relaxing the face, shoulders, arms, and hands until we feel this “wave”. We’ll feel it as a wave of warmth and relaxation.

8) And conversely, as we inhale, we want to feel the blood leaving the hands and feet on its way through the venous system to the right heart and lungs. We’ll feel it as a slight vacuum, almost as if the hands or feet are shrinking slightly during inhalation.

That’s it! You can practice it either sitting or lying down. Recognizing that we’ll all feel this a little differently, give it a try. Please let me know what you experience.

Regarding last month’s *COHERENCE Newsletter*...I proposed that “Snoring tends to accelerate blood flow while we are asleep very much as Coherent Breathing accelerates blood flow while we are awake”. Paraphrasing, a question I received is this: “You compare snoring (while we are asleep) to Coherent Breathing (while we are awake). If the autonomic nervous system is employing soft tissue to partially occlude the airways when we are asleep, then what if anything is performing this role when we are awake? The answer: The nasal turbinates and glottis, both of which are under fine autonomic control. The nasal turbinates shrink and swell and the glottis opens and closes, both of which serve to decrease/increase vacuum on inhalation and decrease/increase pressure on exhalation, respectively.

A second question: It makes sense that the autonomic nervous system would attempt to throttle breathing when we are sleeping with our mouths open. Doesn’t that suggest that the best (and healthiest) way to stop snoring is to keep the mouth closed at night? Answer: Yes, I believe it does. The mouth seems to open while we sleep for a couple of reasons: a) because the jaw relaxes completely, and or b) because the nose is blocked (a function of the turbinates). It is very important that the jaw relax, as the muscles of the jaw are intricately tied to the muscles of the vascular system, i.e., when the jaw relaxes, the vascular system relaxes. There are simple products on the market that will aid the mouth in staying closed at night without interfering with the relaxation of the jaw. If nasal turbinates are chronically enlarged at night, in my experience, it is likely best addressed through dietary modification. Thank you for your questions!

All the best for 2009!

Stephen Elliott