

## The Intelligent Heart

Many of the changes in bodily function that occur during the coherence state revolve around changes in the heart's pattern of activity. While the heart is certainly a remarkable pump, interestingly, it is only relatively recently in the course of human history—around the past three centuries or so—that the heart's function has been defined (by Western scientific thought) as only that of pumping blood. Historically, in almost every culture of the world, the heart was ascribed a far more multifaceted role in the human system, being regarded as a source of wisdom, spiritual insight, thought, and emotion. Intriguingly, scientific research over the past several decades has begun to provide evidence that many of these long-surviving associations may well be more than simply metaphorical. These developments have led science to once again to revise and expand its understanding of the heart and the role of this amazing organ.

In the new field of neurocardiology, for example, scientists have discovered that the heart possesses its own intrinsic nervous system—a network of nerves so functionally sophisticated as to earn the description of a “heart brain.” Containing over 40,000 neurons, this “little brain” gives the heart the ability to independently sense, process information, make decisions, and even to demonstrate a type of learning and memory. In essence, it appears that the heart is truly an intelligent system. Research has also revealed that the heart is a hormonal gland, manufacturing and secreting numerous hormones and neurotransmitters that profoundly affect brain and body function. Among the hormones the heart produces is oxytocin—well known as the “love” or “bonding hormone.” Science has only begun to understand the effects of the electromagnetic fields produced by the heart, but there is evidence that the information contained in the heart's powerful field may play a vital synchronizing role in the human body—and that it may affect others around us as well.

Research has also shown that the heart is a key component of the emotional system. Scientists now understand that the heart not only responds to emotion, but that the signals generated by its rhythmic activity actually play a major part in determining the quality of our emotional experience from moment to moment. As described next, these heart signals also profoundly impact perception and cognitive function by virtue of the heart's extensive communication network with the brain. Finally, rigorous electrophysiological studies conducted at the Institute of HeartMath have even indicated that the heart appears to play a key role in intuition. Although there is much yet to be understood, it appears that the age-old associations of the heart with thought, feeling, and insight may indeed have a basis in science.

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## The Heart-Brain Connection

Most of us have been taught in school that the heart is constantly responding to “orders” sent by the brain in the form of neural signals. However, it is not as commonly known that the heart actually sends more signals to the brain than the brain sends to the heart! Moreover, these heart signals have a significant effect on brain function—influencing emotional processing as well as higher cognitive faculties such as attention, perception, memory, and problem-solving. In other words, not only does the heart respond to the brain, but the brain continuously responds to the heart.

The effect of heart activity on brain function has been researched extensively over about the past 40 years. Earlier research mainly examined the effects of heart activity occurring on a very short time scale—over several consecutive heartbeats at maximum. Scientists at the Institute of HeartMath have extended this body of scientific research by looking at how larger-scale patterns of heart activity affect the brain's functioning.

HeartMath research has demonstrated that different patterns of heart activity (which accompany different emotional states) have distinct effects on cognitive and emotional function. During stress and negative emotions, when the heart rhythm pattern is erratic and disordered, the corresponding pattern of neural signals traveling from the heart to the brain inhibits higher cognitive functions. This limits our ability to think clearly, remember, learn, reason, and make effective decisions. (This helps explain why we may often act impulsively and unwisely when we're under stress.) The heart's input to the brain during stressful or negative emotions also has a profound effect on the brain's emotional processes—actually serving to reinforce the emotional experience of stress.

In contrast, the more ordered and stable pattern of the heart's input to the brain during positive emotional states has the opposite effect—it facilitates cognitive function and reinforces positive feelings and emotional stability. This means that learning to generate increased heart rhythm coherence, by sustaining positive emotions, not only benefits the entire body, but also profoundly affects how we perceive, think, feel, and perform.

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## Heart Rhythm and Coherence

The heart is a primary generator of rhythmic patterns in the human body, and possesses a far more extensive communication system with the brain than do other major organs. In addition, the heart plays a particularly important role in the generation of emotion. With every heart beat, the heart transmits complex patterns of neurological, hormonal, pressure, and electromagnetic information to the brain and throughout the body. As a critical nodal point in many interacting systems - physiological, cognitive and emotional - the heart is uniquely positioned as a powerful entry point into the communication network that connects body, mind, emotions and spirit.

Doc Childre and the research team at the Institute of HeartMath (IHM) have shown that techniques which combine intentional heart focus with the generation of sustained positive feelings lead to a beneficial mode of physiological function they have termed psychophysiological coherence. Correlates of psychophysiological coherence include a sine wave-like pattern in the heart rhythms, increased heart-brain synchronization (alpha rhythms become more synchronized to the heart) and entrainment between heart rhythm patterns, respiration, blood pressure rhythms and other physiological systems. Although psychophysiological coherence is a natural state that can occur spontaneously while people are feeling genuine positive emotions and during sleep, sustained periods are generally rare.



During states of psychophysiological coherence, our inner systems function with a higher degree of synchronization, efficiency and harmony which correlates with improved emotional balance, quality of emotional experience, health, and cognitive performance. HeartMath studies conducted across diverse populations have associated increased psychophysiological coherence with reduced anxiety and depression, decreased physical symptoms negative effects of stress, enhanced immunity, reduced cortisol and increased DHEA.1-5.

IHM has collaborated with Stanford University and other institutions in studies which have shown that heart centered techniques

and psychophysiological coherence facilitate the body's healing processes and improve physical health outcomes. For example, improvements in clinical status have been demonstrated in individuals with hypertension, diabetes, congestive heart failure, asthma and AIDS.6-10.

The emWave Technology, is a unique heart rhythm coherence training program. It objectively monitors your heart rhythms and confirms when you are in the coherence mode. It helps you learn to self-generate coherence and track your progress. With practice you learn how to shift into coherence at will, even in difficult situations which previously would have drained your emotional vitality and buoyancy. You will readily see and experience changes in your heart rhythm patterns as you practice emotional stress management techniques. Your heart rhythms generally become less irregular, and sine wave-like as you send more heart-felt love and appreciation through your system.

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## **The Power of the Heart**

Article written by Howard Martin

In the last few years, more people than ever -- from different backgrounds and walks of life -- are talking about the heart. More company mission statements make a point to mention the importance of the heart in leadership and customer care. More speakers, articles and books, both spiritual and non-spiritual, are referring to the heart. Whether people mention speaking from the heart, listening to the heart, connecting with the heart, or following the heart, it is a clear sign that there is increased energetic awareness of the importance of the heart in all of life's decisions.

As a result, a new understanding of "heart" is emerging-one that moves the view of heart past a philosophical, often soft characterization into the realization of the heart as a dynamic, creative intelligence. The intelligence of the heart encompasses physical, emotional, intuitive and energetic/spiritual aspects of heart, essential for providing discernment and guidance to navigate life and experience wholeness fulfillment. Bringing the physical, emotional, intuitive and spiritual aspects into coherent alignment leads to a new way of perceiving, acting, re-acting, and relating -called Heart-Based Living.

### **The Power of Heart-Based Living**

Heart-based living refers to all intentions and actions that express qualities of the heart in daily life. These heart qualities or core heart values can include appreciating or caring for others, expressing kindness to those around you, and giving back by volunteering to work with others to relieve suffering and to help the planet. Heart-based living allows us to experience less self-centeredness and separation, less judgment, more intuitive discernment and more genuine fulfillment.

For the last eighteen years, my colleagues and I at HeartMath have been exploring the power of the heart physically, emotionally and spiritually. The HeartMath organizations, founded by Doc Childre, have developed a system for personal and organizational development consisting of techniques, tools and technologies designed to utilize the power of the heart to improve performance, health and overall well-being while reducing stress. The entire system is underpinned with breakthrough scientific research on heart-brain communication and the many beneficial effects of experiencing positive emotions, like those long metaphorically associated with "heart".

For me the exploration of the heart, which led me to HeartMath many years ago, began with a genuine desire to become a better, self-empowered person and to find ways to live a life that was more balanced, caring and fulfilling. I read and studied many books and often saw the heart being referred as having influence over our thoughts, feelings and values. I wondered what

"heart" was really all about and did it hold an essential intelligence? Little did I know that the future understanding of heart would usher in new views of physiology and psychology.

Researches here at HeartMath, working in consort with others, have discovered some amazing new understanding about the heart. For me this information was eye opening as it confirmed much of what I intuitively had felt about the heart being a source of wisdom and intelligence.

We all know that the heart pumps blood throughout the body, but new research shows it does a lot more. In fact the heart acts like a master control system sending powerful, healing commands to the brain and the rest of the body.

### **How The Heart Is So Powerful**

First, the heart has a very complex nervous system consisting of neurons, proteins and support cells that sends information to the brain. Scientists around the world who study this nervous system actually call it the "brain in the heart". The information it sends travels through a nerve pathway that originates in the heart and terminates in the higher perceptual centers of the brain. This means that there is an important neurological conversation taking place between heart and brain. When scientists map out this biological conversation they clearly see that the heart is sending a lot more information to the brain than it receives.

The heart also influences brain function through what is called the blood pressure wave. This is the wave of energy created by the beating heart that pushes blood through the arteries and veins. This blood pressure wave influences the electrical activity in the brain. As the blood pressure wave changes so does brain activity. In essence researchers now know that brain function is critically dependent on information it receives from the heart through the heart's nervous system and blood pressure waves!

The third way the heart communicates to the brain and body is through hormones. In 1983 the heart was reclassified as part of our hormonal system. It produces several important hormones and one of them, atrial peptide, helps to reduce the release of the stress hormone cortisol. So, in this third instance, we have a chemical communication going on between heart and body all of the time.

The fourth way, however, is where things get really interesting. The heart is an electrical organ producing by far the largest amount of electrical energy in our bodies-forty to sixty times as much power as the second strongest source, the brain. This energy permeates every single cell in our bodies. The signal is so strong that it creates an electromagnetic field that surrounds the body in 360 degrees and can actually be measured up to three to four feet outside the body. That's right, the electrical energy produced by the heart radiates outside the body into space.

As we examine the heart's energetic communication, we move beyond biology and into physics-how electromagnetic and energetic fields relate to one another. How does the heart's field affect the brain? How do fields created by living systems, like people or animals, affect one another? How does our field interact with the magnetic fields produced by the earth itself? Is the heart producing a non-linear field that extends out far beyond just a few feet? These are all questions that HeartMath researchers are looking at and I'm confident more exciting discoveries about the heart are in store.

Enjoy unfolding the power of your heart to increase your fulfillment.

Howard Martin

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## About the Author

Howard Martin is one of the original leaders who helped Doc Childre found HeartMath. In 1999 he co-authored The HeartMath Solution and he has been with HeartMath's world-wide training and consulting team since its inception in 1991.

Click here to view a short video of HeartMath's CEO Bruce Cryer talking about stress, heart/brain communication and the emWave products.

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