



[Home](#)

[emWave Help](#)

[See all Help Topics](#)

[HeartCloud](#)

[HeartCloud Tour](#)

[emWave Pro Plus](#)

[emWave Pro Plus Software Tour](#)

[emWave Pro Plus Training Videos](#)

[Heart Rate Variability Overview](#)

[emWave Pro Software](#)

[emWave Pro Software Tour](#)

[emWave Pro Training Videos](#)

[emWave2 Handheld](#)

[emWave2 Handheld Tour](#)

[emWave2 Handheld Videos](#)

[emWave2 Software](#)

[emWave2 Software Tour](#)

[Inner Balance Current Vers](#)

[Inner Balance 3.7 + Tour](#)

[Inner Balance for iOS 7 and lower](#)

[Inner Balance 3.0 - 3.6 Tour](#)

[Inner Balance 2.1 Tour](#)

[Coherence](#)

[What is Coherence?](#)

[Science](#)

[Fun Heart Science Videos](#)

[Heart Science Overview](#)

[Results of Coherence Building](#)

[Resources](#)

[Resources](#)

[Practice Plan](#)

[Free Training](#)

[Register Now!](#)

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Heart Rate Variability Overview

Introduction

1. [Heart-brain Communication](#)
2. [Heart Rate Variability: An Indicator of Self-Regulatory Capacity, Autonomic Function and Health](#)
3. [Coherence](#)
4. [Establishing a New Baseline](#)
5. [Bibliography](#)

Introduction

The HeartMath® Institute Research Center has explored the physiological mechanisms by which the heart and brain communicate and how the activity of the heart influences our perceptions, emotions, intuition and health. In the early 1990s, we were among the first to conduct research that not only looked at how stressful emotions affect the activity in the autonomic nervous system and the hormonal and immune systems, but also at the effects of emotions such as appreciation, compassion and care. Over the years, we have conducted many studies that have utilized many different physiological measures such as EEG (brain waves), SCL (skin conductance), ECG (heart), BP (blood pressure) and hormone levels, etc. Consistently, however, it was heart rate variability, or heart rhythms that stood out as the most dynamic and reflective indicator of one's emotional states and autonomic nervous system dynamics. It became clear that stressful or depleting emotions such as frustration and overwhelm lead to increased disorder in the higher-level brain centers which is reflected in heart rhythms and adversely affects the functioning of virtually all bodily systems. This eventually led to a much deeper understanding of the neural and other communication pathways between the heart and brain. Numerous studies have since shown that heart coherence is an optimal state-specific physiological pattern associated with increased cognitive function, self-regulatory capacity, emotional stability and resilience, and that people can learn to shift into the coherent state in the heat of the moment.

Our research and that of others indicates the heart is far more than a simple pump. The heart is, in fact, a highly complex information processing center with its own functional "brain," commonly called the heart-brain that communicates with and influences the cranial brain via the nervous system, hormonal system and other pathways. These influences profoundly affect brain function and most of the body's major organs and play an important role in mental and emotional experience and the quality of our lives. Healthy, optimal function is a result of continuous, dynamic, bi-directional interactions among