

The emWave® PC/Mac Stress Relief System: A Stress Management Training and Heart Rhythm Education System for Increasing Physiological Coherence

R. McCraty, M. Atkinson and W. Tiller

Proceedings of the Tenth International Montreux Congress on Stress, Montreux, Switzerland, 1999.

This presentation will cover the background, purpose and uses of a new approach to stress management training that has broad-based applications in schools, blood pressure control and other health-related areas, sports performance and workplace stress reduction. It is a computer-based training and heart rhythm education system that teaches the stress and emotional self-management techniques Freeze-Frame and Heart Lock-In, which are particularly effective in increasing heart rhythm coherence and improving autonomic balance.

The emWave® PC/Mac Stress Relief System can also be used to monitor the effects of techniques such as meditation, controlled breathing and other interventions believed to affect autonomic nervous system activity. The emWave® PC/Mac is a convenient and accurate device that monitors and displays your heart rate variability in real time as you practice the stress management techniques taught in the on-line menus and books included with the system. It plots the speeding and slowing of your heart rate on a beat-to-beat basis and analyzes the heart rhythm patterns for coherence. Coherence reflects autonomic nervous system balance and entrainment of the body's inner systems. The output of the entrainment algorithm is used to control three fun games that are designed to reinforce emotional self-management skills.

A small finger sensor detects each pulse and the time interval between consecutive heartbeats is computed. The changing beat-to-beat heart rate is then displayed on the computer screen. In general, a smoother or more sine-wave-like heart rate variability pattern indicates a more balanced autonomic nervous system and a higher ratio of physiological entrainment. The ratio of entrainment is calculated and fed back to the user as an accumulated score or success in playing one of three games. The three on-screen games are: 1. The hot air balloon game, in which the degree of heart rhythm coherence controls how high the balloon flies. There are obstacles that must be cleared as you travel through a moving landscape. When the heart rhythm coherence is too low, the balloon returns to the ground and stops the landscape from moving. 2. The rainbow game, in which the heart rhythm coherence controls the development of a rainbow that gradually grows until it reaches a pot of gold, which starts to fill and then overflow with gold coins! At the end of this game a score is calculated telling you how much you have accumulated. 3. The meadow game, in which a dry, black-and-white nature scene gradually transforms into a beautiful landscape filled with color, running water and gentle animals.

Several examples of the how the emWave® PC/Mac has been used in research studies in diverse settings to facilitate the practice of stress management techniques will be discussed. Results from individuals who have used the system to improve health problems will also be shown.

For further detail on heart rhythm coherence feedback and the emWave® PC/Mac Stress Relief system, see also:

- [emWave Desktop® Mac/PC](#)
- [Heart Rhythm Coherence Feedback: A New Tool for Stress, Rehabilitation, and Performance Enhancement](#)