

***Respiratory sinus arrhythmia versus neck/trapezius EMG and incentive inspirometry biofeedback for asthma: a pilot study. Lehrer P, Carr RE, Smetankine A, Vaschillo E, Peper E, Porges S, Edelberg R, Hamer R, Hochron S. Appl Psychophysiol Biofeedback. 1997 Jun;22(2):95-109.***

This pilot study compared biofeedback to increase respiratory sinus arrhythmia (RSA) with EMG and incentive inspirometry biofeedback in asthmatic adults. A three-group design (Waiting List Control n = 5, RSA biofeedback n = 6, and EMG biofeedback n = 6) was used. Six sessions of training were given in each of the biofeedback groups. In each of three testing sessions, five min. of respiratory resistance and EKG were obtained before and after a 20-min biofeedback session. Additional five-min epochs of data were collected at the beginning and end of the biofeedback period (or, in the control group, self-relaxation). Decreases in respiratory impedance occurred only in the RSA biofeedback group. Traub-Hering-Mayer (THM) waves (.03-.12 Hz) in heart period increased significantly in amplitude during RSA biofeedback. Subjects did not report significantly more relaxation during EMG or RSA biofeedback than during the control condition. However, decreases in pulmonary impedance, across groups, were associated with increases in relaxation. The results are consistent with Vaschillo's theory that RSA biofeedback exercises homeostatic autonomic reflex mechanisms through increasing the amplitude of cardiac oscillations. However, deep breathing during RSA biofeedback is a possible alternate explanation.