



HEALTH & WELLNESS / LIFESTYLE

Stress in the Modern Age: Impact on Homeostasis and What You Can Do (Pt. 2)

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Editor's note: As the author states in part 1 of this article, "The list of negative consequences from chronic, unresolved stress is seemingly endless. Clearly, communications net-works (e.g., electrochemical and electromagnetic, of homeostatic function), must be renormalized through various methodological approaches initially external to the organism's natural adaptive mechanisms." That statement sets the stage for the following discussion.

Neurotransmitters and the Stress Response

GABAergic neurons are decreased in generalized anxiety disorders. GABA is gamma-amino butyric acid, a principle inhibitory neurotransmitter used to treat epilepsy. In generalized anxiety disorder (GAD), there is increased noradrenaline transmission from the locus ceruleus and caudal raphe nuclei, increasing heart rate, dilated pupils, tremor and sweating.

Serotonergic pathways also show the effects of generalized stress, etc. Thus, it is necessary to utilize methods that affect neurotransmitters (e.g., neurotransmitter intensification or inhibition), synaptic transmission (e.g., nerve growth factors that affect neuronal protection mechanisms and plasticity of synapses), the charge densities and distributions of neuroendocrine tissues, neuroendocrine communications networks; the electromagnetic profiles of tissue to maintain molecular coherence, cooperativity and communications; and regulation of the tonicity of the autonomic nervous system, among other considerations.



Various methods have been utilized effectively to accomplish this, ranging from spiritual healing to meditation, massage, physical therapy, dietary regulation, nutritional supplements, biofeedback, craniosacral therapy, herbal medicine, homeopathy, imagery, acupuncture, naturopathy, osteopathic medicine, psychoneuroimmunology, psychotherapy, Tibetan / Chinese medicine, yoga, reiki, and reflexology. Research suggests another method to reduce stress, tension, strain and anxiety - the synergistic use of chiropractic care and magnetic resonance therapy.

Using Natural Mechanisms to Modulate the Stress Response

As has been discussed, regulation of communications between the brain and end organs is critical to the control of CNS and autonomic nervous system functionality. When the body's natural mechanisms for adapting to stressors become inadequate over time, it becomes necessary to change the tonicity of the nervous system - e.g., enhance the parasympathetic function while removing the anatomical mesoscopic blockages of the spinal cord, to permit flow of information to the end organs such as viscera, muscles and joints.

Even a slight displacement and strain of the vertebrae causes electromechanical interference with the spinal cord and nerves, impairing electrochemical conduction mechanisms required for coherent communication between the brain and end organs.

Chiropractic care frees the body of impingements that derogate necessary information transfer and homeostatic mechanisms. Stress adversely affects the ANS, which innervates smooth and cardiac muscles, as well as glands, while the visceral nervous system is a major component of the ANS. Thus, chiropractic care is required to permit the body to rebound from stress and all its negative sequelae.

What's more, parasympathetic stimulation maintains (or renormalizes) body functions analogous to quiet, day-to-day living conditions, promoting relaxation and diminution of stress (whatever the

stimulus).

Magnetic resonance therapy utilized to enhance parasympathetic function may permit heart rate reduction, promote digestion and absorption of food, promote regular heart rhythm, normal sleep patterns, (for the body to rest and recover), promote normal kidney function, and enhance feelings of relaxation. This can reduce pain, tension, anxiety and strain. Pulsed, electromagnetic field therapy, utilizing naturally occurring, physiologic magnetic fields, helps the body to restore its own state of natural adaptability.

Thus, [picoTesla](#) (pT) magnetic fields (measured as natural to the brain) can be used to modulate (from an atomic and molecular level) ANS and brain function, providing a safe, efficient, non-invasive modality to be utilized synergistically with chiropractic care to address conditions of stress, strain, pain, stiffness and inflammation.

What the Science Says: Magnetic Fields for Stress

Recent basic science, animal and clinical research has demonstrated that extremely low-frequency (within the EEG spectrum) magnetic fields (MFs) of low amplitude (natural biological intensities) can modulate the brain magnetic profile and the tone of the ANS. Numerous studies on rats and dogs have revealed that picoTesla magnetic fields exert a profound parasympathetic effect on nervous tissues of the heart (ganglionated plexi on the heart surface) to decrease heart rate and restoration of normal rhythmicity. [This research](#) was conducted at the University of Oklahoma Arrhythmia Research Institute, under the direction of Professor Benjamin Scherlag.¹¹

Studies at the Weill Medical College of Cornell University revealed the capacity of low-frequency, low-intensity magnetic fields to induce, *in vivo*, regeneration of peripheral nerves after poisoning with neurotoxin. Structures seen to renormalize (under electron microscope) were Golgi bodies, producers of nerve growth factor; myelin sheath, mitochondria, axonal membrane, neurofilaments and microtubules. The studies were replicated in mice at Fairleigh Dickinson University under the direction of Professor Anjali Saxena.¹²

Additionally, utilizing pT MFs, a double-blind, placebo-controlled, randomized clinical study on idiopathic Parkinson's disease revealed a statistically significant benefit in the cardinal features of this CNS disorder, including postural stability, rigidity, tremor and bradykinesia. Additional benefits were noted in sleep, pain and affect.¹³

It is particularly important to note that vagal effects secondary to magnetic resonance stimulation of the parasympathetic nervous system are durable.¹¹ When an individual is more relaxed over time, the capacity for adaptation to stress is improved, thus maintaining homeostatic mechanisms critical for health. In fact, durability of magnetic resonance therapy was noted in all the basic science and clinical studies discussed above.¹¹⁻¹⁴

For example, in a double-blind clinical study on osteoarthritic knees, the statistically significant benefits in pain reduction and stiffness were almost identical one month after the last of eight treatments administered over a two-week period.¹⁴

Since 2007, more than 16,000 patients have been treated with PT MFs, revealing a safe and effective method of enhancing feelings of relaxation non-invasively and painlessly, to provide the synergistic modality for chiropractic care in reducing life's stresses and strains.

References (for parts 1 and 2)

1. Selye H. *The Stress of Life*. NY: McGraw-Hill, Inc., 1956.
2. Humphrey JH. *Anthology of Stress Revisited*. Nova Science Publishers, 2005.
3. Cannon WB. Physiological Regulation of Normal States: Some Tentative Postulates Concerning Biological Homeostatics. In: Jubilee volume to Charles Richet. Paris: *Editions Medicales*, 1926:91-93; reprinted in *Homeostasis: Origins of the Concept, Benchmark Papers in Human Physiology*, 1973.
4. Selye H. Confusion and controversy in the stress field. *J. Human Stress*, 1975;1(2):37-44.
5. Van De Graaff KM, Ward RR. *Human Anatomy and Physiology*. NY: McGraw-Hill, Inc., 1987.
6. *The Merck Manual, 18th Edition*. NJ: Merck and Co., Inc., 2006; pp. 118, 601-603, 1677-1678.
7. Murray M, Pizzorno J. *Encyclopedia of Natural Healing*. NY: Three Rivers Press, 1998.
8. de Kloet R, et al. Stress and the brain; from adaptation to disease. *Nature Rev Neurosci*, 2005;6(6):463-475.
9. Schore A. *Affect Regulation and the Repair of the Self*. NY: W.W. Norton, 2003.
10. Shaley AY, et al. *International Handbook of Human Response to Trauma*. NY: Klower Academic/ Plenun Press, 2000.
11. Scherlag B, et al. Magnetism and cardiac arrhythmias, *Cardiology in Rev*, 2004;12(2):85-96.
12. Saxena A, et al. A hypothetical mathematical construct explaining the mechanism of biological amplification in an experimental model utilizing pico-Tesla (pT) electromagnetic fields. *Med Hypoth*, 2003;60(6):821-839.
13. Klepitskaya O; Kumar R. Efficacy and safety of low level electromagnetic field treatment in Parkinson's disease. *Movement Disord*, 2008;23(11):1628-1637.
14. Jacobson JI, et al. Pico-Tesla range magnetic fields tested in four site, double blind clinical study for treatment of osteoarthritic knees. *Estratto da Gazzetta Medica Italiano-Archivo Per Le Scienze Mediche*, 2001;160:1-18.

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