

PSYCHOSOMATICS MANUAL

Section G

AUTONOMIC REGULATION

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AUTONOMIC REGULATION

By Kuno Bachbauer, M.D.

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THE POWER OF THE AUTONOMIC NERVOUS SYSTEM

The Autonomic Nervous system is balancing the experiences from your inner and your outer world. It draws its power from mediating that fine line between your body, your mind and your emotions. It is there for you when you eat, when you dance, and when you sleep. It never rests, yet it helps you sleep (...and sometimes it keeps you awake!). It regulates your heart beat, your sweat glands and your breathing. It helps you reach out to make contact and resonate with your world, and it makes sure that you avoid harm when you do so. It fights on your side against germs and lions alike, and it is equally effective at both. It is there for you when you relax and when you are afraid, ashamed, or angry. When things become too overwhelming for you, it causes your system to withdraw, shut down, (and sometimes even to faint). It plays a role when you are jumping from joy, making love, or looking for a job! Together with your “emotional brain”, it lets you and others know how you really feel, and what you really want. It is your “vigilant guardian” and your “benevolent nurturer”. It is a huge aspect of your life and it has a part in what makes you human (yet, most people are not even aware of its existence). If you are healthy it gives you red cheeks and adds that bounce to your step, and if you are imbalanced it will make you look physically sick or feel emotionally contracted. And, in its magic ways, it may also be your link to experiencing the Divine.

The Autonomic Nervous System gives a Core Energetic therapist constant information about what goes on in a client: glassy eyes, pale skin, dizziness that comes up during an exercise, changes in heart rate, sweating, nausea, goose bumps, “streaming” sensations & vibration, reports of sexual dysfunction, etc all these are signs of the underlying connection between “energetic charge”, “emotional state” and the functioning of the Autonomic Nervous System as its mediator!
[charge (=mainly sympathetic) vs. discharge (=mainly parasympathetic)]

As you can imagine, the Autonomic Nervous system is a wonderful tool for any therapist! Understanding it may help you understand your clients (and yourself) a little better. Knowing how it works may radically influence how you treat your clients (and yourself). Mastering its power fully may be a pathway towards transformation!

Wow! Wouldn't you want to learn more about this? Let's explore together these miracles of the Autonomic Nervous system!

THE ANATOMY OF THE A.N.S.

Humans have two nervous systems: the central nervous system is composed of the brain and spine while the peripheral is, well, everything else. The ANS, a large part of the peripheral nervous system, is also called the involuntary nervous system because these nerves innervate smooth and cardiac muscle as well as glandular tissues and this governs involuntary actions. There are two divisions of the ANS: the sympathetic nervous system comes on line in emergency situations that require us to fight or take flight while the parasympathetic works in non-emergency situations and allows us to rest and digest. Both branches of the ANS make sure you avoid harm while reaching out and "shaking hands" with the world.

(From: Catherine Edwards)

The Autonomic Nervous System (= Sympathetic & Parasympathetic NS) carries both "afferent" (= towards the brain - sensory information from internal organs) & "efferent" fibers (= towards internal organs - activating glands, heart, intestines, etc.).

Together, the afferent and efferent fibers build reflex arcs that connect the internal organs & glands, including the viscera (= "gut"), bladder, sex organs, heart & blood vessels, lungs, etc. to the proper segment(s) of the spinal cord. The purpose of this system is self-regulation of basic bodily functions. It constitutes the biological basis for any form of aggression and withdrawal and the substrate for our emotional states.

These autonomic reflexes are largely unconscious. They are governed by rather complex connections to the "Emotional Brain" (limbic system & various centers in the hypothalamus). From the spinal segment, information directly travels along various "tracts" (= super highways in the spinal cord) to and from the Reticular Activating System (= "R.A.S.") which has to do with autonomic integration, arousal and alertness and also to and from some of the "nuclei" of the hypothalamus (= nerve centers in a part of the "emotional brain"). That way, impulses can be modulated by the "Emotional Brain" as the center (and to some degree, the "thinking brain" via the Reticular Activating Formation as will be shown below).

BIOLOGICAL FUNCTIONS OF THE AUTONOMIC NERVOUS SYSTEM

All your spontaneous internal activities are regulated and balanced that way: The autonomic reflex arc tells your system when to sweat, how rapidly to breathe, how fast your heart needs to beat and when to have goose bumps. It is responsible for the reflexes that initiate vomiting and swallowing.WAU!! ... and all that without being actively conscious of it! It does it all for you - whether you are awake or asleep!

Of course, to some degree it can be influenced by the mind as I want to show you with the "Autogenic Relaxation" exercise. In this technique you influence the balance of the autonomic system through visualization ("My arm is heavy and streaming warm") and the periphery reacts by relaxing not only the "striate" (= skeletal) muscles but also the smooth muscles of the blood vessels, etc. This vascular relaxation opens the diameter of the arterioles (smaller than arteries), which in turn makes your arm warm and streaming because of the increased blood flow. As opposed to earlier theories, the two components of the Autonomic Nervous System are not antagonists but they function synergistically in a healthy person. However, because of our life stress & "character defenses", most of us need to shift our system from a sympathetic mode (self-defense, attack) to a more para-sympathetic (nurturing, relaxed) orientation.

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SYMPATHETIC NERVOUS SYSTEM

- Fires the body up for ACTION: "FLIGHT OR FIGHT"
- Neurotransmitter: Adrenaline
- Activates body-mind for increased focus, alertness & mental acuity
- Pathology:
Hyper-arousal (constant "flight or fight" mode), defensiveness, attack & rage.
Aggressive.

PARASYMPATHETIC NERVOUS SYSTEM

- Slows the body down for RECOVERY, "REST & RESTORATION",
WITHDRAWAL
- Neurotransmitter: Acetylcholine
- Slows down body-mind for contemplation, rest & meditation
- Pathology:
"Shut down" when overwhelmed.
"Frozen". Depression. Apathy, Desensitized. Numb.
Withdrawal. Avoidant.

THE RETICULAR ACTIVATING SYSTEM (= "R.A.S.")

From the spinal segment, information directly travels along various "tracts" (= super highways in the spinal cord) to and from the Reticular Activating System (= "R.A.S."). It also has connections to and from some of the "nuclei" of the hypothalamus (= nerve centers in a part of the "emotional brain"). The R.A.S. has to do with autonomic integration, arousal and alertness

The Reticular Activating System:

AROUSAL & SEDATION

That way, impulses can be modulated by the "Emotional Brain" as the center (and to some degree, the "thinking brain" via the Reticular Activating Formation as will be shown below).

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AUTONOMIC REGULATION AND CHARACTER

For us as Core Therapists it is important to consider the Autonomic Nervous System for its function in charge and discharge, coping with stress, "psychosomatic" medicine (= mind-body connection), and also for its correlation to what happens in Character defenses. On an internal, "visceral" level, the equivalent to the typical muscular tension patterns (which are governed by the peripheral sensory/motor nervous system) of a "Character" defense is a systemic imbalance of the autonomic system.

As far as the muscular expression of "Character Structure" goes, it is worth to be mentioned that the Autonomic Nervous System has an influence on "muscle spindles". These are the sense organs in muscles that report muscle tone to the higher levels of the nervous system. The Autonomic Nervous system has an influence on the reactivity of muscle fibers. Sensory and motor nerve impulses are modulated by the sympathetic fibers interweaving at the muscle spindle (= sensory portion) and at the gamma motor-neuron (= motor portion). Emotional issues thus may have a direct influence on the sensitivity of the motor system (and vice versa) by setting a "base line" for our posture in form of increased or lessened tension in our posture. (Based on Dietrich Klinghardt, MD). An example for this relevant to Core Energetics practice would be a client's vocal cords. If someone is very tense, nervous or afraid (Sympathetic NS) her voice sounds very high and shrill, after exercise or emotional release (Parasympathetic NS) that same person's voice would sound more relaxed and deeper.

Constant suppressed fear, aggression, collapse, hopelessness, etc. will create a specific pattern of imbalance in the autonomic nervous system. These imbalances are fairly (but not exactly) specific to the internal conflict of the person and may be expressed initially in the reversible form of a "dys-regulation" (i.e.: dyspepsia = sour stomach) and later as a psychosomatic illness with actual chronic tissue damage of increasing severity (i.e.: stomach ulcer, stomach cancer).

The Sympathetic Nervous System also innervates immune organs: Thymus, bone marrow, spleen, lymph nodes. Receptors for catecholamines (= a fancy name for adrenaline) are found in lymphocytes (B-cells & T-cells). In stress adrenaline is released via the Autonomic Nervous system (sympathetic branch) and regulates lymph cells. Specific and unspecific stress is a mediator in any illness via the immune system. It is a co-factor in developing disease from allergies, auto immune and inflammatory diseases to a person's proneness for bacterial infection or cancer.

All this means that the Brain can influence the function of the immune system – and vice versa!! (The immune cells send out neurotransmitters as biological messengers to specific receptors in the brain and elsewhere).

Research on animals and humans shows that Immune cells can be "trained" with Pavlovian methods. Modern healing techniques based on the fact that the mind can influence the immune system would be: Autogenic training, guided visualization techniques, biofeedback and some forms of meditation. The medical field studying the relationship between the mind and the immune system is relatively young and is called "Psycho-neuro-immunology".

One of the best and most accessible methods to study, measure and influence the regulation of the Autonomic nervous system is through the "Heart Rate Variability Test". This is a computer-based diagnostic device that calculates changes in the frequency of the heart rate and can demonstrate a person's capacity to cope with stress. It can also be used for patients to teach them how to influence the Autonomic Nervous system via a built-in biofeedback mechanism. (See class demonstration)

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Similar correlations as above also exist between the Autonomic Nervous System and Endocrine glands such as pancreas, adrenal glands, thyroid and gonads, amongst others. The medical specialty studying the influence of the emotions on the hormonal balance of a person is called "Psycho-neuro-endocrinology" (Endocrine glands produce hormones).

NOTE: As will be mentioned in other classes, the Autonomic Nervous System is not the only information system regulating the bridge between the mind, emotions and the body. As is described in the class on "Bio-Communication", (1) nerve impulses from and between the Neo-Cortex and the Emotional Brain ("Limbic System"), (2) hormones released from various glands in the body, (3) neurotransmitters released within the brain (the latest neuroscience shows almost every cell in the body produces and has receptor sites for neurotransmitters), information substances released from your (4) immune system, (5) the genetic system (DNA, protein production, enzymes, etc.), our (6) "Living Matrix", (i.e. the energetic properties of our connective tissues and the electro-magnetic properties of body cells and tissues), and our (7) energetic system (Aura, Chakras) all work together, in a wonderful symphony to achieve HEALTH, a balanced function of all the autonomic (= self-regulating) systems within the body.

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SYMPATHICOTONIA & VAGOTONIA

THE TWO TYPES OF ILLNESSES: "Flight/Fight" versus "Withdrawal" TWO <u>very different</u> TYPES OF ILLNESS	
<p style="text-align: center;"><u>Sympathetic:</u></p> <p style="text-align: center;">"Flight/Fight"</p> <p style="text-align: center;">over-stimulation in AROUSAL MODE</p> <p style="text-align: center;">Withheld aggression Inhibition of assertive & hostile impulses</p> <p><u>Resulting Illness:</u></p> <ul style="list-style-type: none"> ▪ Cardiac neurosis ▪ Migraines ▪ Hypertension ▪ Hyperthyroidism ▪ Rheumatoid arthritis ▪ "Hyper"-..... 	<p style="text-align: center;"><u>Parasympathetic:</u></p> <p style="text-align: center;">"Withdrawal"</p> <p style="text-align: center;">over-stimulation in REST MODE</p> <p style="text-align: center;">Vegetative retreat</p> <p><u>Resulting Illness:</u></p> <ul style="list-style-type: none"> ▪ Functional disorders of G. I. tract ▪ Bronchial asthma ▪ Fatigue states ▪ Ulcer (peptic) ▪ Constipation ▪ Diarrhea ▪ Colitis ▪ "Hypo"-.....

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THE “POLY-VAGAL SYSTEM”

The Autonomic Regulation of Bonding and Social Interaction

This is from a Lecture reviewed by Catherine Edwards:

Kuno Bachbauer said further:

“The sympathetic nervous system is in charge of stress responses like increased heart rate and breathing to bring more oxygen for faster and sharper decision. Whereas stress responses at the parasympathetic level would more likely be about slowing down the organism, freezing in fear, or playing possum.”

*The vagus nerve, the longest of the twelve pairs of cranial nerves that originate in the brain, has also functions in the larynx, diaphragm, heart and stomach as well as sensory functions in the ears and tongue. It connects brain, heart and gut and this is where **Stephen Porges, Ph.D.** focused his research. He moved on to combining this knowledge with phylogeny, the study of living organisms’ evolution. From this research he developed the **POLY-VAGAL THEORY**: the Vagus Nerve in humans evolved to create a third section of the autonomic nervous system set. Kuno referred to this third system as the **SOCIAL VAGUS** (‘social nervous system’) that exhibits more sophisticated physiological reactions to social interactions.*

POLY-VAGAL THEORY:

*the Vagus Nerve in humans evolved to create a third section of the autonomic nervous system set. Kuno referred to this third system as the **SOCIAL VAGUS** (‘social nervous system’) that exhibits more sophisticated physiological reactions to social interactions.*

Porges writes, “Unique to mammals, characterized by a myelinated vagal system that can rapidly regulate cardiac output to foster engagement and disengagement with the environment... [the social system] fosters early mother-infant interactions and serves as a substrate for the development of complex social behaviors... in addition the mammalian vagal system has an inhibitory effect on sympathetic pathways to the heart and thus promotes calm behavior and pro-social behavior.”

Kuno exemplified one aspect of the social nervous system he called “Motherese” (scientific: “procity”) that tone of voice and language mothers use to calm their children. Therapists can use vocal tones to subtly shift the atmosphere of therapy sessions. A voice shift can help people move into different energetic states. This can be in either direction; a low and gentle sound to soothe or an energized voice that helps a person to charge up and stay with the therapist.

For the next exercise, we choose different partners and this time music was part of the experience. For me, music adds spontaneity and I have an easier time moving without thinking.

After we exchanged our reactions to moving with each other, Kuno told us how he remembered learning about the afferent autonomic nerves that move information back to the brain. This give and take of information in the brain can mean that moving your body a certain way will affect how you feel. The act of making a smiling face might bring the smile back to the brain

As he had us speak to each other about our experiences with the exercises he talked about the importance

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of putting an experience into words so you know you had it. I realized my experience becomes part of my narrative. And I build on my narrative with other experiences.

Stress impacts the human body. Cell wall porous-ness is influenced when the sympathetic nervous system is pumped into flight or fight mode. During stressful situations, adrenalin is delivered into the tissue and this hardens our muscles and fascia.

Kuno explained, "Character structure is how the story of a child translates in every level of existence. The story is a response to childhood trauma and that response goes with a particular stance towards life. It is a physical, emotional, mental and energetic hologram I'm developing as a child and this freezes into us, kept as a memory and a first response."

Kuno explained. Character structure is a learned, self-protective neurological, muscular and connective tissue holding pattern that forms into a habit. Kuno thinks that the postural patterns of a Character structure is based on the modulating influence of the sympathetic nervous system on the muscle spindles (= the kinesthetic sense organs of our muscles) and also by the effect of adrenaline by hardening the connective tissue (= fascia) when one is under stress.

Understanding this process, we can also override and release our pattern with intentional exercises. For instance, the stress positions created in Body Psychotherapy by John Pierrakos, MD and Alexander Lowen, MD. These positions are sometimes the opposite of the habits held by our bodies and practicing these can make us more aware, spontaneous and free "

From a lecture delivered to the D.C. Guild of Body-Psychotherapists by Kuno Bachbauer, MD.
Reported by Catherine Edwards

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Resources: “AUTONOMIC REGULATION”

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Body Process. 1999. Kepner, James. Gestalt Institute of Cleveland Press, Cleveland, Ohio.

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Parenting from the Inside Out. 2004. Siegel, Daniel J. Tarcher Books, New York City, NY.