IMPACT OF “IN SYNC” TECHNIQUES ON BODY & MIND

The integration of the two techniques (Progressive Muscle Relaxation; Deep Breathing) impact both the Fascia Network and the brain’s Insular Cortex. The following is a very brief summary of the science behind these techniques.

SUMMARY OF FASCIA SYSTEM

Every person’s body’s organs, beneath the skin surface, is wrapped in connective tissue, called the fascia. This is an energetic network which creates electrical currents and does not require neurons for communication. It functions with biochemical processes, obtaining its energy from the basic building blocks of life (sodium, calcium, potassium, chloride). In evolutionary terms, it is a very old system, existing with the first live organism on earth. In the human, this system later came to be integrated with the brain and nervous system. The fascial tissue is equally distributed throughout the entire body, enveloping, interacting with and permeating blood vessels, nerves, viscera, meninges, bones, and muscles, creating various layers at different depths and forming a tri-dimensional metabolic and mechanical matrix. The fascia is “an organ” which affects an individual’s health.

From an embryological perspective, the fascial system develops before the brain and nervous system, and originates in the mesoderm. This connective network plays a role in the development of the embryological organs and the network can be found in the neural crest (ectoderm), particularly in the cranial and cervical areas. Considering the total number of all the fascial receptors, the sensitivity of the fascial system is greater than that of the visual retina (considered the most powerful sense organ), making the fascial continuum the richest sensory organ of the body (1).

These fascia receptors provide the functions of proprioception (gravity body location), nociception (pain awareness), and interoception (awareness of the bodily condition based on the information derived directly from the body). Through its glial cells (separate from the nervous system) communication pathways are formed to all organs. There are specific pathways which are routed to the brain’s frontal cingulate cortex and the dorsal posterior insula. Interoception can change the exteroceptive (external sensory) representation of the body. Dysregulation of the pathways that manage or stimulate interoception can cause a distortion of one’s own consciousness and body image. (2)

PROGRESSIVE RELAXATION, DEEP BREATHING & FASCIA (4,5,6,7)

Conceptual terms of Fascia:

fascial anisotropy: the system can change to assume different properties

tensional network: The musculoskeletal system maintains tension in a continuous network of muscles and connective tissues, while the bones provide discontinuous compressive support. Even the human spine, which seems at first glance like a stack of vertebrae resting on each other, is actually a tensegrity structure. The fascial system also functions in this manner.

functional pressure: refers to tensions and compressions occurring in cellular structures and transmitted via signaling to other cells.

The fascia system is composed of “liquid crystals” which have exquisite sensitivity, flexibility, and quick responsiveness (anisotropy). These liquid crystals begin to communicate with other body parts when the “tensional network” becomes activated with “functional pressure.” When put under compression or tension, the liquid crystals develop electromagnetic fields. All movement, of the body as a whole or of its smallest parts, is created by tension carried through the fascia via the “streaming electromagnetic fields.” When the functional pressure reaches a certain point, the molecules begin to vibrate coherently (together) across body systems, leading to the emission of coherent light (termed “biophoton”) and “muscle sounds.”

It is through this vibrational communication process that a fascial cell gains “memory and awareness” of the mechano-metabolic information it feels, and prepares itself for alteration of its flexible response to any environmental changes. Though this energetic process, the fascia continuum can influence the shape and function of the entire body. This primary function cannot be altered by the brain neurons. It is this mechanism which allows you to “learn skills” needed for your life (language, sports, writing, etc.) but also the same mechanism which allows “trauma reactions” to be “memorized” in the body.

It is by this same process that humans have “healed themselves” for thousands of years through various physical manipulations (i.e., acupuncture, acupressure, physical therapy, yoga). Progressive Muscle Relaxation is a more recent discovery. In your psychotherapy, you consciously apply the “functional pressure” while simultaneously performing another major “functional pressure” technique of Deep Breathing. The diaphragm is a sheet of muscle and tendons separating the abdomen from the chest. These muscle fasciae are tensed and relaxed when you inhale and exhale. Rhythmically tightening and contracting changes the pressure on the entire fascial network.

PROGRESSIVE RELAXATION, DEEP BREATHING & INSULAR CORTEX

The fascia receptors activate neuronal C fibers in the areas of the brain that are usually involved in emotional states, such as the insular cortex, without activating the somatosensory cortex areas. In other words, with fascia activation, you may have a feeling/emotional experience without awareness that the activation is coming from the body fascia network. However, the state of the myofascial continuum can alter the emotional state of the person without conscious awareness required from the person.

In fact, the very posture of the body stimulates the areas of emotionality. (“Posture” refers to the position of the body in space and has the purpose of maintaining the body in balance, during the dynamic movements and statis.) A dysfunctional myofascial system alters the posture and the emotional state, creating a chronic holding pattern. (3,8) These patterns are socially defined as a “personality structure” as they form “defenses” which only permit certain behaviors from the individual. It is these patterns that we begin to alter in psychotherapy, once the body fascia system is cleared of dysfunction.

The brain functions of the Insular Cortex is the first brain center to begin to change with the new messages from the fascia system. Your “awareness” of the internal and external sensory messages is the first change to occur, as this level of cellular “awareness” is a direct result of altering the health stage of the fascia system.

Deep Breathing with a counting pattern where exhale is twice as long as inhale falls into the category of “volitional breathing.” The combination of mindful control to the breath creates changes which a normal breathing pattern does not. Neural oscillations entrain to respiration and creates a neural rhythm, which is deeply intertwined with cognitive and affective functions like memory, attention and sensory processing. Respiration specifically modulates high frequency oscillations such as gamma activity (40–150 Hz), which are known to govern attention, decision making, problem solving, language processing, and sensory perception.

The slower respiratory rhythm is coupled to faster cortical rhythms which facilitate long distance brain synchronization in the cortical areas responsible for the integration of interoceptive and exteroceptive signals, and vice versa: top-down directions issued by these cortical regions then regulate physiological responses. In other words, deep breathing modulates emotional responses such as anxiety, and its impact, creating system-wide changes in the physiological, affective, and

cognitive domains.(9) A recent nursing study shows that the combination of Progressive Muscle Relaxation and Deep Breathing will effectively reduce pain severity and frequency, headache-related disability, and improve sleep quality. (10)

Progressive Muscle Relaxation combined with the yawn response and deep breathing is one technique which activates the pandiculation response of the human fascia system. (11)



1. <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7524024/> (Embryology of the Fascial System)
2. <https://www.researchgate.net/publication/285208490_Fascia_as_a_body-wide_communication_system>
3. <https://www.karger.com/Article/Fulltext/464149> (Emotions in Motion: Myofascial Interoception)
4. <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6281443/> (The Awareness of the Fascial System)
5. <https://journals.sagepub.com/doi/full/10.1177/2515690X17750750> (Emission of Biophotons and Adjustable Sounds by the Fascial System)
6. <https://core.ac.uk/download/pdf/148366526.pdf> (Genomic instantiation of consciousness in neurons through a biophoton theory)
7. <https://www.va.gov/WHOLEHEALTHLIBRARY/tools/progressive-muscle-relaxation.asp>
8. <https://www.cell.com/current-biology/pdf/S0960-9822(17)30546-8.pdf> (The insular cortex)
9. <https://www.frontiersin.org/articles/10.3389/fnins.2021.647579/full> (Keeping the Breath in Mind: Respiration, Neural Oscillations, and the Free Energy Principle)

10) <https://www.researchgate.net/publication/351998524> (Effectiveness of Progressive Muscle Relaxation and Deep Breathing Exercise on Pain, Disability, and Sleep Among Patients with Chronic Tension-Type Headache

# 11) <https://pubmed.ncbi.nlm.nih.gov/21665102/> (Pandiculation: nature’s way of maintaining the functional integrity of the myofascial system?)