An Osteopathic Appreciation of Fascia and Myofascial Release

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Andrew Taylor Still, MD, DO

Andrew Taylor Still, MD, DO

A. T. Still on Anatomy

- “As you contemplate studying this science and have asked to know the necessary studies, I wish to impress it upon your minds that you begin with anatomy, and you end with anatomy...a knowledge of anatomy with its application covers every square inch of ground that is necessary to qualify you to become a skillful and successful Osteopath, when you go forth into the world to combat diseases... O Lord! Give me more anatomy each day I live...” (Philosophy of Osteopathy)

More Anatomy

- “To know all of a bone in its entirety would close both ends of an eternity.”
- “If a man would be better to himself and study more anatomy, he would enjoy more useful knowledge, and God would be as well off and more reverenced.”
- “Teach it to your children, and they will have less use for war... I know that every one of you intend to master anatomy. It is a parents’ duty to teach children something of this.”
- “The human body is a machine run by the unseen force called life, and that it may be run harmoniously it is necessary that there be liberty of blood, nerves, and arteries from their generating point to their destination.”

- “Osteopathy is a science that analyzes man and finds out that he partakes of Divine intelligence.”
- “God manifests Himself in matter, motion, and mind. Study well His manifestations.”
- “God or Nature is the only doctor whom man should respect.”
- “I am satisfied that a revolution stands before you today – a healing revolution…” (Autobiography of A.T. Still)

FASCIA

A. T. Still, MD, DO

From “Philosophy of Osteopathy”, American Academy of Osteopathy, Colorado Springs, CO, 1977, pages 22-23, 162, 164-168

- “I know of no part of the body that equals the fascia as a hunting ground. I believe that more rich golden thought will appear to the mind’s eye as the study of the fascia is pursued than any division of the body. Still one part is just as great and useful as any other in its place. No part can be dispensed with. But the fascia is the ground in which all causes of death do the destruction of life. Every view we take, a wonder appears...”

FASCIA

A. T. Still, MD, DO

From “Philosophy of Osteopathy”, American Academy of Osteopathy, Colorado Springs, CO, 1977, pages 22-23, 162, 164-168

- “With this foundation established we think we prove conception, growth, and cause of all diseases to be in the fascia. As this philosophy has chosen fascia as a foundation on which to stand, we hope the reader will chain his patience for a few minutes on the subject of the fascia, and its relation to vitality. It stands before the philosopher as one of, if not the deepest living problems ever brought before the mind of man…”

FASCIA

A. T. Still, MD, DO

From "Philosophy of Osteopathy", American Academy of Osteopathy, Colorado Springs, CO, 1977, pages 22-23, 162, 164-168

- "The fascia gives one of, if not the greatest problems to solve as to the part it takes in life and death. It belts each muscle, vein, nerve, and all organs of the body. It is almost a network of nerves, cells and tubes, running to and from it; it is crossed and filled with, no doubt, millions of nerve centers and fibers to carry on the work of secreting and excreting fluid vital and destructive. By its action we live, and by its failure we shrink, or swell, and die. Each muscle plays its part in active life. Each fiber of all muscles owes its pliability to that yielding septum-washer, that gives all muscles help to glide over and around all adjacent muscles and ligaments, without friction or jar. It not only lubricates the fibers but gives nourishment to all parts of the body. Its nerves are so abundant that no atom of flesh fails to get nerve and fluid supply therefrom..."

FASCIA

A. T. Still, MD, DO

From “Philosophy of Osteopathy”, American Academy of Osteopathy, Colorado Springs, CO, 1977, pages 22-23, 162, 164-168

- “This life is surely too short to solve the uses of the fascia in animal forms. It penetrates even its own finest fibers to supply and assist its gliding elasticity. Just a thought of the completeness and universality in all parts, even though you turn the visions of your mind to follow the infinitely fine nerves. There you see the fascia, and in your wonder and surprise, you exclaim, “Omnipresent in man and all other living beings of the land and sea”.”

FASCIA

A. T. Still, MD, DO

From “Philosophy of Osteopathy”, American Academy of Osteopathy, Colorado Springs, CO, 1977, pages 22-23, 162, 164-168

- “Other great questions come to haunt the mind with joy and admiration, and we can see all the beauties of life on exhibition by that great power with which the fascia is endowed. The soul of man with all the streams of pure living water seems to dwell in the fascia of his body...”

FASCIA

A. T. Still, MD, DO

From “Philosophy of Osteopathy”, American Academy of Osteopathy, Colorado Springs, CO, 1977, pages 22-23, 162, 164-168

- “As we dip our cups deeper and deeper into the ocean of thought we feel that the solution of life and health is close to the field of the telescope of our mental search lights, and soon we will find the road to health so plainly written that the wayfaring man cannot err though he be a fool…”

FASCIA

A. T. Still, MD, DO

From "Philosophy of Osteopathy", American Academy of Osteopathy, Colorado Springs, CO, 1977, pages 22-23, 162, 164-168

- "As the student of anatomy explores the subject under his knife and microscope he easily finds this membrane goes with and covers all muscles, tendons and fibers, and separates them even to the least fiber. All organs have a covering of this substance, though they may have names to suit the organs, surfaces or parts spoken of."

FASCIA

A. T. Still, MD, DO

From “Philosophy of Osteopathy”, American Academy of Osteopathy, Colorado Springs, CO, 1977, pages 22-23, 162, 164-168

- “We write much of the universality of the fascia to impress the reader with the idea that this connecting substance must be free at all parts to receive and discharge all fluids, if healthy to appropriate and use in sustaining animal life, and eject all impurities that health may not be impaired by the dead and poisoning fluids. Thus a knowledge of the universal extent of the fascia is almost imperative, and is one of the greatest aids to the person who seeks cause of disease. He of all men should know more of the fascia, and when disease is local or general. That the fascia and its nerves demand his attention first, and on his knowledge of the same, much of his success, and the life of his patients do depend...”

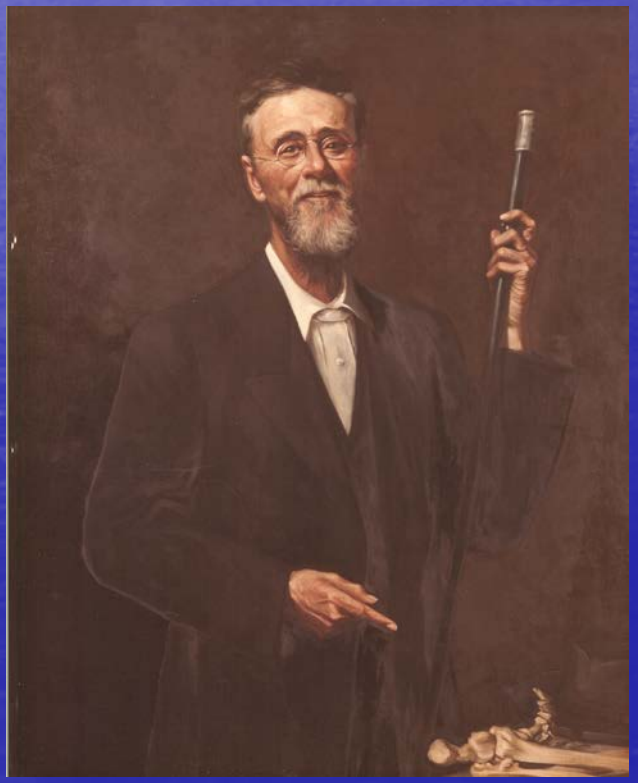
FASCIA

A. T. Still, MD, DO

From “Philosophy of Osteopathy”, American Academy of Osteopathy, Colorado Springs, CO, 1977, pages 22-23, 162, 164-168

- “When you deal with the fascia you deal and do business with the branch offices of the brain, and under the general corporation law, the same as the brain itself, and why not treat it with the same degree of respect?”

Andrew Taylor Still, MD, DO



Osteopathic Manipulative Medicine

- Andrew Taylor Still, M.D., D.O. (1828-1917), founded the Osteopathic philosophy, art, and science in 1874, as a medical system with a holistic perspective of health and disease, emphasizing the central position of the neuromusculoskeletal system in illness and injury, with Osteopathic palpatory diagnosis and treatment being integrated into successful health care of all kinds and specialties (1). The Osteopathic concept emphasizes four general principles, which are profound, elegant, verified by science, and integrateable into all of medicine: the body is a unit, the body possesses self-regulatory mechanisms, structure and function are reciprocally interrelated, and rational therapy is based upon an understanding of body unity, self-regulatory mechanisms, and the interrelationship of structure and function (1). Osteopathic Manipulative Medicine (O.M.M.) is defined as the "application of Osteopathic philosophy, structural diagnosis, and use of Osteopathic Manipulative Treatment in the diagnosis and management of the patient" (1).

Osteopathic Manipulative Treatment

- Osteopathic Manipulative Treatment (O.M.T.) – holistic Osteopathic palpatory diagnosis and treatment – is indicated for most illnesses and injuries (1). O.M.T. techniques, done by Doctors of Osteopathy (D.O.), cover a broad range of treatments to aid and enhance in the diagnosis and treatment of every part of the body, mind, and soul, its solids, liquids, gases, and energies. The techniques vary, as well, with the skills, knowledge, background, and temperament of the practicing Osteopathic physician. One may combine and modify techniques in the hand of skilled and imaginative practitioners in response to their needs as well as the needs of their patients. The holistic Osteopathic philosophy and principles allow and encourage individuality, inventiveness, and inclusiveness, and are easily integrateable with other Osteopathic techniques as well as those from other traditions. Any technique may take seconds to minutes; medicines: either oral, topical, or injectable may be added at any time.

Somatic Dysfunction

- Somatic dysfunction is diagnosed with the patient, which then justifies using O.M.T. Somatic dysfunction is defined as: “impaired or altered function of related components of the somatic (body framework) system: skeletal, arthrodial, and myofascial structures, and related vascular, lymphatic, and neural elements” (1). Somatic dysfunction may also be described in terms of visual and palpatory positional and motion aspects, using the simplified mnemonic “TART”: “*t*issue texture abnormality, *a*symmetry, *r*estriction of motion, and *t*enderness, any one of which must be present for diagnosis” (1).

Somatic Dysfunction

- One or more somatic dysfunctions are diagnosed on the patient, including: restrictions of the lumbar spine such as neutral or non-neutral, forward or backward bending, sidebending and/or rotating left or right; sacral dysfunctions such as forward or backward bending torsions left or right, sacral base posterior, etc.; pelvic dysfunctions such as anterior or posterior pelvis, etc.; myofascial restrictions and/or tender points in the lumbar, sacral, and pelvic regions. If somatic dysfunctions of other areas, such as cervical and/or thoracic, etc., are found, then these are also treated. It is an Osteopathic principle that the body is a unit, and that signs, symptoms, and dysfunctions in any one part may affect or be affected by any other part, and thus are treated together for maximum benefit and relief.

O.M.T.

- About fifty O.M.T. techniques are listed in the glossary of the Osteopathic profession's standard textbook Foundations for Osteopathic Medicine, The techniques are chosen after visual and palpatory diagnosis, as well as taking into consideration the many factors of the patients' history, conditions, pain levels, responses to treatments past and present, etc. The end results of the O.M.T. treatments are: relief of somatic dysfunction (tissue texture abnormality, asymmetry, restriction of motion, and tenderness), improved ranges of motion, reduced or removed facilitated spinal cord nerve segments and their symptoms, decreased pain, decreased swelling, normalized skin temperature, comfort and relief of the patient's fears and anxieties, educating and supporting the patient's good postural and exercise habits, preventing future recurrences, and feeling more energy.

Osteopathic Principles and Practice

- Irvin M. Korr, Ph.D. (1909-2004), an Osteopathic scientist, philosopher, and humanist wrote eloquently that human life is expressed in human behavior, through the neuromusculoskeletal system, thus giving the neuromusculoskeletal system a central place and means of expression of our humanity and individuality. Because the neuromusculoskeletal system affects and is affected by all other bodily systems, including the internal viscera, it thus lies central to the diagnosis and treatment of most conditions, giving O.M.T. a strategic role in the management of the many aspects and facets of patient health care (1).

Osteopathic Principles and Practice

- The body expends enormous energy maintaining homeostasis, which is the body's maintenance of a relative balance of the internal environment, through thousands of simultaneously dynamic equilibric processes, from a microscopic to a macroscopic level. The circulatory and nervous systems mediate the communication and interdependence of the entire person, from the cell to the entire being. The person is even more than the sum of his/her anatomy and physiology: emotions, personality (behavior patterns), mind (with its many definitions and characteristics), energies (also with their many definitions and characteristics), and spirit (consciousness).

Osteopathic Principles and Practice

Dr. Korr states in his “An Explanation of Osteopathic Principles”:

- “Clinical and biomedical research (as well as everyday experience) has irrefutably shown that body and mind are so inseparable, so pervasive to each other, that they can be regarded – and treated – as a single entity. It is now widely recognized (whether or not it is demonstrated in practice) that what goes on (or goes wrong) in either body or mind has repercussions in the other. It is for reasons such as these that I prefer unity of the person to unity of the body, conveying totally integrated humanity and individuality.” (1)

Osteopathic Principles and Practice

Pain pathophysiology:

- Tissue injury stimulates an inflammatory response.
- Pain signals transmitted to the brain (unmyelinated nerves/nociceptors/C-fibers transmit signals to second-order nociceptive neurons in the dorsal horn of the spinal cord, then up the spinothalamic tract to the cerebral cortex, where they are then processed, modulated, and interpreted.)

Osteopathic Principles and Practice

Pain pathophysiology

- ***Nociceptive*** system is balanced by an ***antinociceptive*** system.
- **Antinociceptive** system releases:
  - **endorphins** (periaqueductal gray matter in brain),
  - **enkephalins** (nucleus raphe magnus in brainstem), and
  - **dynorphins** (spinal interneurons in the substantia gelatinosa of the dorsal horn).

Osteopathic Principles and Practice

- **Endorphins -** bind to *mu-opioid* receptors on pre- and post-synaptic nociceptive neurons in the dorsal horn – inhibiting pain signal propagation.
- **Enkephalins –** bind to *delta-opioid* receptors on inhibitory interneurons in the substantia gelatinosa in the dorsal horn of spinal cord – release gama-aminobutyric acid (GABA) and other biochemicals (e.g., norepinephrine, oxytocin, relaxin, etc.) – inhibiting pain signals in the spinal cord.
- **Dynorphins –** bind to *kappa-opioid* receptors in spinal interneurons – close N-type calcium channels in the spinal cord cells that relay pain signals to the brain.

Osteopathic Principles and Practice

- The balanced interplay between the ***nociceptive*** and ***antinociceptive*** systems allows perception, modulation, and interpretation of pain within normal functioning.

Osteopathic Principles and Practice

- **Chronic pain** – repetitive stimulation of pain signal pathways over time – may result in physical changes or modifications in those pathways, that then increase resistance to antinociception and result in hypersensitivity to pain signals. Emotional changes, perceptions and influences occur as well.

Osteopathic Principles and Practice

- Pain is a complex biopsychosocial process
- The nervous system is a neuro-immuno-endocrinological system.
- Pain can be nociceptive, neuropathic, combinations, other...

Osteopathic Principles and Practice

- Pain physiology
- Central sensitization: abnormal central processing and amplification of excitatory neurons; dorsal horn of spinal cord; acute (changes to existing proteins) and chronic (changes in gene expression).
- Neuroplasticity: the ability of neurons to change their structure, function, or chemical profile.

Osteopathic Principles and Practice

- Hyperalgesia = heightened sensitivity to painful stimuli.
- Allodynia = painful response to ordinary stimuli.
- Central sensitization clinically reveals itself as all of the above plus spread of pain to non-injured areas.

Osteopathic Principles and Practice

- Gate theory of pain modulation:
- Non-nociceptive neurons (A beta, such as light touch) activate inhibitory interneurons in lamina II, inhibiting neurons in lamina V, closing the “gate” to central transmission of pain.
- Nociceptive neurons (C, A delta) open the gate.
- The balance between the two modulates pain.

Osteopathic Principles and Practice

- Glial cells: once thought to be only supportive, have receptors that respond to neuronal activity, and express pro-inflammatory cytokines and growth factors.
- Part of the pain mediation response.

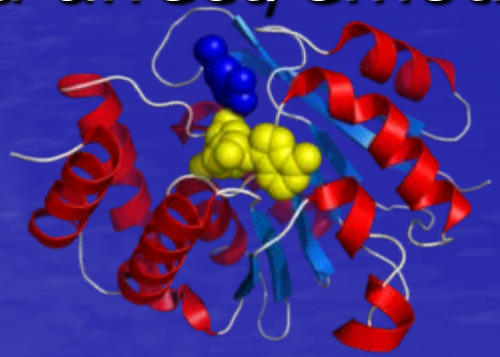
Osteopathic Principles and Practice

Chronic pain

- N-methyl-D-aspartate (NMDA) receptors – activated after large amounts or persistent release of glutamate.
- Results in hypersensitization – allowing stimulation of central neural pain pathways from less input from peripheral pathways.
- Less glutamate is needed to signal pain.
- More antinociceptive neurotransmitters needed.
- Pain – nociception – intensifies, then more meds are needed, etc.

Osteopathic Principles and Practice

- COMT = Catechol-O-methyl-transferase
- Degrades catecholamines: dopamine, norepinephrine, epinephrine
- Valine158Methionine (codon 158)
- When Valine is substituted for Methionine, patients have increased sensitivity to pain, and increased affect/emotional response.



Osteopathic Principles and Practice

- Pain (nociceptive and neuropathic) mechanisms, as well as various reflexes (facilitated reflexes, inappropriate proprioceptor reflexes, etc.) also help determine patient signs and symptoms, and subsequent treatments. Nerves do more than simply convey signals across their lengths, they also contain and transport trophic factors responsible for homeostasis, growth, and maintenance of their destination organs. Various reflexes have been identified throughout the body, including viscerosomatic (from internal organs to the more external neuromusculoskeletal regions), somatovisceral (from external to internal), viscerovisceral (internal to internal), and somatosomatic (external to external) (1).

Osteopathic Principles and Practice

- Repeated pathological stimulation of either viscera or soma result in summation characteristics of nervous reflexes, called facilitation. Facilitated or low threshold areas can be self perpetuating and can continue over any length of time, becoming chronic areas of reflex excitability. Nerve habituation (the ability to dampen the nervous response) and sensitization (the ability to respond to a stimulus) function to maintain a balance between the extremes of underreaction and overreaction to nervous stimuli. Pain, inflammation, and dysfunction can all negatively influence the nervous input and output from soma or viscera, affecting function and structure at either end of the reflex. Signs and symptoms of somatic dysfunction result (TART) which can be seen and/or palpated for diagnosis and treatment. (1)

Osteopathic Principles and Practice

- A simple example of a single trigger point which acts as both a somatovisceral and a viscerosomatic reflex is the trigger point located in the right pectoralis muscle. This trigger point, a small, tight, tender area within the muscle, causes supraventricular tachyarrhythmias (thus it acts as a somatovisceral reflex). When it is the actual cause, the arrythmia disappears when the trigger point is treated. The opposite is also true, when cardiac pathology may produce trigger points in the pectoralis (a viscerosomatic reflex).(2)

Osteopathic Principles and Practice

- Because of its complexity and interrelationship with the entire body, the nervous system has often been renamed or described as the neuro-immuno-endocrinological system. Neuropeptides, endocrine hormones, and immune system biochemicals all signal and interact with one another, producing a wide variety of responses. For instance, a noxious stimulus to a nerve can trigger the release of neuropeptide substance P from the peripheral terminals of a primary afferent nerve ending. Substance P can then trigger immune cells such as mast cells to release histamine, prostaglandins from capillary endothelial cells, and bradykinin from circulating preprobradykinin. A tissue inflammation response is thus initiated, which may sensitize the nerve cells more, resulting in a self-perpetuating cycle, which translates to the patient as pain, inflammation, and dysfunction. Many other neurochemicals are also involved, such as: gamma amino butyric acid, serotonin, epinephrine, adenosine, glycine, cortisol, etc. (1)

Osteopathic Principles and Practice

- Sensitization in the spinal cord creates spinal facilitation as the product of multiple factors. This in turn results in altered output in the spinal ventral roots, causing altered muscle tone in the associated spinal segments, as well as altered signals to the internal viscera and vice versa. Complex pathways also carry pain and dysfunction signals through various spinal tracts (spinothalamic and spinoreticular tracts) to the brainstem and brain (reticular formation, hypothalamus, limbic, pituitary gland, and frontal cortex), resulting in the perceptions and processing of the various signals, consciously, emotionally, and unconsciously. Neural, hormonal, and immunological feedback mechanisms function to restore natural homeostatic balances throughout the body, or fail, with various effects. The physical and emotional/mental components of pain and dysfunction can be addressed by O.M.M. by affecting, either directly or indirectly, the complex but accessible neuro-immuno-endocrinological system. (1)

Osteopathic Principles and Practice

Pain can be summed up in four major steps:

1. Transduction: a noxious stimulus signals a receptor which converts (transduces) it into an electrical impulse.
2. Transmission: the impulse moves from the peripheral to the central nervous system.
3. Modulation: occurs between the primary afferent nociceptors and the secondary neurons at the dorsal horn of the spinal cord, then travel up the spinal cord to the brain, sometimes interacting with other neurons along the way.
4. Perception: pain pathways branch out to affective and cognitive centers, where the influence of memory, emotional responses, and meaning given to those responses are then processed and even further modified in the context of the current pain stimulus.

O.M.T.

- Obviously, our body is a miraculously and marvelously complex system, and when it's all working in an orderly and healthy fashion, we feel and function normally. And when there is disorder or dysfunction or restrictions, then we have injuries or illnesses. The holistic Osteopathic concept maintains that since most injuries or illnesses have a neuromusculoskeletal component, either as cause or effect, then diagnosing and correcting the somatic dysfunctions should help in the treatment. And it's true!
- Thousands of studies and millions of treatment hours by thousands of practitioners around the world have contributed to the body of research and proof that Osteopathic manipulation works for a wide variety of illnesses and injuries.

FASCIA

- Every cell has an electric charge, multiplied in effect through the many organs of the body. Physicians commonly measure the electrical output and thereby interpret and diagnose the conditions of several organs: electrocardiogram (ECG) for the heart, electroencephalogram (EEG) for the brain, electromyelogram (EMG) for muscles, and nerve conduction studies as well. Physicists, especially quantum physicists, have been teaching over the last hundred years that energy and matter are but different aspects of each other ($E=MC^2$, or energy equals mass multiplied times the speed of light squared). Physicists describe the entire universe as an interpenetrating field of information-based energy. James Oschman, Ph.D. writes and speaks specifically about Osteopathy and O.M.T., and describes in detail the consequences of alignment of the body's collagenous networks for the energy field of the body. He describes magnetic fluxes through the vertebral column and surrounding tissues which give rise to the overall field of the body, as well as the effects of derangements of the parallel collagenous fibers, which reduce the total magnetic flux through the system and reduce the overall energy field (5, 6). Osteopathic physician/authors have also contributed to the subject (3, 7-12). Another new and novel concept published in 2005 is that O.M.T. may be mediated by the endocannabinoid system (13).

FASCIA

- Myofascial release techniques combine several types of O.M.T., including cranial Osteopathy, visceral manipulation, strain counterstrain, facilitated positional release, etc., and can be combined with any form of O.M.T. Myofascial release techniques are directed to all the soft tissues of the body, and can be basically divided into either direct (to or through a barrier/restriction) or indirect (away from the barrier/restriction). Myofascial release techniques may be used for virtually any diagnosis of somatic dysfunction, either alone or in combination with other manipulative techniques. The techniques may be passive (patient relaxed and not assisting) or active (physician and patient both actively participate) or both (1).

FASCIA

- As general principles, the physician first palpates an area of somatic dysfunction, usually defined as an area which may have any or all of the following: tissue texture change, asymmetry, restricted motion, or tenderness (TART) (1). The physician may then move the body part either to or away from the barrier/restriction/dysfunction, possibly adding other vector forces with his/her hands, with or without the patient's assistance. The amount, time, direction and force of motion all depend on many factors, including the patient, his/her dysfunctions, the physician and his/her abilities. The main object of the technique (and perhaps all manual techniques) is to effect or enhance motion. Other goals of treatment can be summarized as:

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- “Relaxation of hypertonic, contracted muscles for the purpose of restoring normal joint motion, relieve muscle pain, and decrease oxygen demand by the muscle. The muscle may be prepared for the performance of other manipulative techniques.
- Increase circulation to the soft tissues.
- Increase venous and lymphatic drainage from the soft tissues.
- Stimulate hypotonic muscles via the stretch reflex.
- Provide general relaxation for the patient and familiarize the patient with the process of touch used during manipulative procedures.” (14).

FASCIA

The physiological principles relevant to myofascial release techniques are many, and include:

- Extensibility or plasticity of the connective tissues.
- Stretch reflex, which excites the muscle spindle, used in active techniques for stimulating hypotonic muscles.
- Heat, when applied to muscle usually increases its elasticity.
- Muscle spindle reflex, used in active techniques; the muscle spindle will maintain a stretch reflex, thus further exciting extrafusal fibers, if the extrafusal fibers contract less than the intrafusal fibers.
- Golgi tendon organ reflex, used in active techniques; when given enough tension in a tendon, the inhibitory effect from the Golgi tendon organ can cause the muscle to relax.
- Reciprocal inhibition, used in active techniques; the stretch reflex simultaneously excites one muscle and inhibits its antagonist.
- Crossed extensor reflex, used in active techniques with resistance; the stretch reflex stimulates one muscle, then crosses to the other side of the spine to excite the contralateral antagonist (15).
- Piezoelectricity, stress generated potentials, Wolff's law, elasticity, plasticity, and the connective tissues' response to deformation all serve in the palpatory basis for diagnosis and treatment, signaling cells and collagen to respond to stress (3).

FASCIA

- Strain-Counterstrain (or simply Counterstrain) is an indirect, myofascial release technique developed by Lawrence H. Jones, D.O., F.A.A.O., in the 1960's. His first paper in 1964, "Spontaneous Release By Positioning" (16) was followed by his book, "Strain and Counterstrain" in 1981 (17). A revised and expanded version was printed before his death (18), and two other related books have followed it (19, 20). Four more papers have been written expanding on his concepts (21-24). This author was personally trained by Dr. Jones in these techniques, and uses them often.

FASCIA

- Dr. Jones defined it as “Relieving spinal or other joint pain by passively putting the joint into its position of greatest comfort” and “Relieving pain by reduction and arrest of the continuing inappropriate proprioceptor activity” (17). Dr. Jones mapped out tender points throughout the body, in the muscles, tendons, ligaments, and fascia, in fairly predictable locations. The basics of his theories are: that a given muscle which was shortened has now been suddenly stretched, changing from short to long so rapidly that it activates the primary annulospiral proprioceptors in the muscle spindle, reporting a “strain” before ever reaching its neutral length. This alpha-gamma loop and mechano-receptor misinformation, or “inappropriate proprioceptor reflex” reports a strain thereafter, where there is none. The central nervous system reacts to the false strain signal by having the muscle protect itself by contracting as it normally would during an actual injury or strain. This ongoing, noxious process of continuing strain behavior (habituation and sensitization) produces and maintains pain and dysfunction (18).

FASCIA

- The patient feels subjective pain and weakness in the strained muscle, while objective signs of pain, contraction, irritation, inflammation, or edema are found in the antagonist muscle. The false strain signals maintain these signs/symptoms, which may in time degenerate into actual lesions, not resulting from the original injury per se, but from the prolonged false strain behavior. The actual technique of passively putting the muscle in the position of comfort shortens the antagonist and stretches the painful muscle, thus shortening the proprioceptor reporting the false strain so its "inappropriate" signals become "appropriate", and the false strain message is stopped. Physician-guided, passive, slow movements, holding the body part for approximately 90 seconds (the amount of time required for the proprioceptor firing to decrease in frequency and amplitude), and return to neutral lengths do not allow the dysfunction to restart. The severity, acuteness/chronicity, and emotional aspects of the injury are all factors in determining the treatment and length of treatment. In true Osteopathic fashion, Dr. Jones said, "Treatment itself does not cure; it only stops this irritation, finally permitting the body to cure itself. Stopping the irritation causes healing to begin. Maintaining it stopped gives the body opportunity to use its ability to heal itself for this problem, too." (18) Tender points can be quite painful, last indefinitely if untreated, and eventually draw in other dysfunctional patterns, or at least maintain other dysfunctional patterns locally or distally from them, by virtue of their fascial interconnectedness. Strain-Counterstrain techniques are satisfying and easy on the patient and the practitioner both, as they are done slowly and carefully, putting the patient in the position of comfort.

FASCIA

- An overview and explanation of O.M.M./O.M.T. pain, and fascia including some of their latest scientific research and theories have been discussed. Their mechanisms of action, along with their central theme of the all-pervading fascia and its many biomechanical, biochemical, and bioelectrical, properties have been briefly presented. Palpatory diagnosis and treatment are also central, from a physical to an energetic, microscopic to macroscopic perspective.
- Fascia “may transmit electrical, cellular, and tissue remodeling signals throughout the body, each in response to mechanical forces but on different time scales. Many tissues, including collagen, display immediate local electrical gradients in response to mechanical stress. Mechanical contacts between fibroblast cells are actively altered within minutes. Finally, tissue remodeling has been shown in tendons, ligaments and joint capsules, and if this process is also present in loose connective tissue it would provide a body wide pattern to remodel connective tissue based on movement and local tissue stress. Interactions among these three systems could provide both short term and long term responses.” (Fascia Research, 2007)

Dr. Still's Books

- Philosophy of Osteopathy (1899)
- The Philosophy and Mechanical Principles of Osteopathy (1902)
- Autobiography of A. T. Still (1908)
- Osteopathy Research and Practice (1910)

Books about Dr. Still

- **Andrew Taylor Still** by Trowbridge
- **Frontier Doctor, Medical Pioneer** by Still
- **The Lengthening Shadow of Dr. Andrew Taylor Still** by Hildreth
- **Early Osteopathy in the Words of A. T. Still** by Schnucker
- **Sage Sayings of Still** by Webster
- **Doctor A. T. Still in the Living** by Truhlar
- **The First School of Osteopathic Medicine** by Walter
- **The D.O.'s** by Gevitz
- **Osteopathic Medicine/An American Reformation** by Northrup

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