AN INTEGRATIVE APPROACH;

Osteopathy and its functional effects on the total human organism
CONCEPTS OF INTEGRATION

Holism,
Neurologic Control,
Circulatory function
Energy expenditure
Self regulation

“The field of manual medicine looks at the musculoskeletal system in a much broader context – as an interrelated part of the total human organism” – Lisa DeStefano, D.O

The concept of Holism:

Although most physicians will accept the concept of integration – specific and usable concepts of how that integration occurs (and its relationship in structure + manual therapy), seem to be limited.

Osteopathy considers the functional capacity of the total human organism – interested in the dynamic process of disease, the unity of the body, and the healing power of nature. Holding that the body has within itself, all those things necessary for the maintenance, healthy and recovery - the role always, is to enhance this capacity. 1 Good rest, clean air, proper food, positive emotions, are all considered equally important factors. 2

The concept expressed here is one that speaks of the integration of the total human organism, rather than a summation of its parts – the concept is one of evaluating the whole.

The musculoskeletal system constitutes most of the human body and is an integral part – alterations within it, affect total body health and the ability of the body to recover from injury and disease. The interrelationship of structure and function has been espoused by Virchow early in the 19th century, and Andrew Taylor Still applied this principle within his concept of total body integration. He strongly felt that structure governed function and that function influenced structure, and thereby, correcting hindering causes to the normal flow of blood and other fluids, by remembering that the arteries, veins, and nerves are responsible for repairs, would keep peace and harmony throughout the whole brotherhood of labourers within the human body. 3

The concept of holism is not new. In the 4th century bc Socrates warned that treating one part of the body only would not have good results. Hippocrates considered that many factors contribute to the health or otherwise of a human being, weather, nutrition, emotional factors, and in our time, a host of different sources of pollution can interfere with health. 4 (Skinner)

J. C. Smuts, a South African scholar in 1926, first conceptualized holism. In his book, “Holism and Evolution,” Smuts created the word holism from the Greek word holos, which means whole. He then outlined the philosophy of holism, which reiterates Aristotle’s philosophy of “the whole is greater than the sum of its parts.” According to Smuts, the mechanical putting together of parts does not account for the integrated characteristics or connected function of a living and unified holistic human being. He described holism as a universal phenomenon and a recognizable expression of nature. In medicine, the philosophy of holism accommodates somebody’s physical,

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1 (Lisa DeStefano, 2011)
2 (Littlejohn)
3 (Still)
4 (Skinner)
mental, and social conditions, not just physical symptoms in the treatment of illness - the integration of body, emotions, and spiritual elements are important aspects in patient care. In Osteopathy, holism is a principle of treatment and a perceptual field that is connected and integrated. One of Andrew Taylor Still’s terms for holism was “connected oneness.”

**The concept of Neurologic (Neural) Control:**
The concept of neurologic control is based on the fact that humans have the most highly developed and sophisticated nervous system in the animal kingdom. All functions of the body are under some form of control by the nervous system. A patient is constantly responding to stimuli from the internal and external body environments through complex mechanisms within the central and peripheral nervous systems. All these reflex mechanisms are constantly under the local and central modifying control of excitation and inhibition – conscious and subconscious control mechanisms that from the brain constantly modify activity throughout the nervous system, responding to stimuli.  

ANS – The Autonomic Nervous system is made up of two divisions – the parasympathetic and the sympathetic. The parasympathetic division includes cranial nerves: III, VII, VIII, IX and X and the S2, S3 and S4 levels of the spinal cord. The largest and most extensive nerve of the parasympathetic division is the Vagus. The Vagus innervates all of the visceral from the root of the neck to the midportion of the descending colon and all glands and smooth muscle of these organs. The Vagus nerve is the primary driving force of the cardiovascular, pulmonary, neuroimmune, endocrine, and gastrointestinal systems and has an extensive distribution. Many pharmaceutical agents alter parasympathetic activity, particularly that of the Vagus. The Sympathetic division of the ANS is represented by preganglionic neurons originating in the spinal cord from T1 to L3 and the lateral chain ganglion including the superior, middle and inferior cervical ganglia. Sympathetic fibers innervate all of the internal viscera as does the parasympathetic division but are organized differently. The sympathetic division is organized segmentally. (all of the viscera above the diaphragm receive their sympathetic innervation from preganglionic fibers above T4 and T5, and all the viscera below the diaphragm receive their sympathetic innervation preganglionic fibers from below T5. It is through this segmental organization that the relationships of certain parts of the musculoskeletal system and certain internal viscera are correlated. Remembering that the musculoskeletal system receives only sympathetic division innervation and receives no parasympathetic innervation. Control of all glandular and vascular activity in the musculoskeletal system is mediated through the sympathetic divisions of the ANS.

**The concept of Circulatory Function:**
The third concept is that of circulatory function. The concept can be simply described as the maintenance of an appropriate cellular milieu for each cell of the body. Picture a cell, a group of cells making up a tissue, or a group of tissues making up an organ resting in the middle of the “cellular milieu”. The cell is dependent for its function, whatever its function is, upon the delivery of oxygen, glucose, and all other substances necessary for its metabolism being supplied by the arterial side of the circulation. The arterial system has a powerful pump, the myocardium of the heart, to propel blood forward. Cardiac pumping function is intimately controlled by the central nervous system, particularly the ANS, through the cardiac plexus. The vascular tree

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5 (Lisa DeStefano, 2011)  
6 (Lisa DeStefano, 2011)
receives its vasomotor tone control through the sympathetic division of the ANS. Anything that interferes with sympathetic ANS outflow, segmentally mediated, can influence vasomotor tone to a target end organ. The arteries are also encased in the fascial compartment of the body and are subject to compressive and torsional stress that can interfere with the delivery of arterial blood flow to the target organ or cell. Once the cell has received its nutrients and proceeded through its normal metabolism, the end products must be removed. The low-pressure circulatory systems, the venous and the lymphatic systems, are responsible for the transport of metabolic waste products. Both the venous and lymphatic systems, are much thinner walled than the arteries, and they lack the driving force of the pumping action of the heart, depending instead on the musculoskeletal system for their propelling action. The large muscles of the extremities contribute greatly to this activity, but the major pump of the low-pressure system is the diaphragm. Because of the extensive attachment of the diaphragm with the musculoskeletal system (upper lumbar, lower six ribs, xiphoid process, and through myofascial connections with the lower extremities, the psoas and quadratus lumbarum muscles) and its innervation via the phrenic nerve from the cervical spine, alterations in the musculoskeletal system at a number of levels can alter diaphragmatic function and consequently venous and lymphatic return. Accumulation of metabolic end products in the cellular milieu interferes with the health of the cell and its recovery from disease or injury.

Another circulatory concept related to function concerns the lymphatic system and the location where it empties into the venous system. The lymph from the right side of the head, right side of the neck, and right upper extremity enters into the right subclavian vein at the thoracic inlet just behind the anterior end of the first rib and the medial end of the clavicle. The lymph from the rest of the body empties into the left subclavian vein at the thoracic inlet behind the anterior extremity of the left first rib and the medial end of the left clavicle. Alteration in the biomechanics of the thoracic inlet, particularly its fascial continuity, can affect the thin-walled lymph vessels as they empty into the venous system.

Maximal function of the musculoskeletal system is an important factor in the efficiency of the circulatory system and the maintenance of a normal cellular milieu throughout the body.\(^7\)

The concept of Energy Expenditure:
The fourth concept is that of energy expenditure primarily through the musculoskeletal system. The musculoskeletal system not only constitutes more than 60% of the human organism but also is the major expender of body energy. Any increase in activity of the musculoskeletal calls on the internal viscera to develop and deliver energy to sustain that physical activity. The greater the activity of the musculoskeletal system, the greater is the demand. If dysfunction alters the efficiency of the musculoskeletal system, there is an increase in demand for energy, not only for increased activity, but for normal activity as well. If we have a patient with compromised cardiovascular and pulmonary systems who has chronic congestive heart failure, any increase in demand for energy delivery to the musculoskeletal can be detrimental. For example, a well-compensated chronic congestive heart failure patient who happens to sprain an ankle and attempts to continue normal activity might well have a rapid deterioration of the compensation because of the increased energy demand by the altered gait of the sprained ankle. Obviously, it would make more sense to treat the altered musculoskeletal by attending to the ankle sprain than to increase the dosage of medications controlling the congestive heart failure.\(^8\)

\(^7\) (Lisa DeStefano, 2011)
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Restriction of one major joint in a lower extremity can increase the energy expenditure of normal walking by as much as 40%, and if two major joints are restricted in the same extremity, it can increase by as much as 300%.

Multiple minor restrictions of movement of the musculoskeletal system, particularly in the maintenance of normal gait, can also have a detrimental effect on total body function.9

**The concept of Self Regulation:**
The fifth concept is that of self-regulation. All living organisms depend on maintaining a complex set of interacting metabolic chemical reactions. Homeostatic processes act at the level of the cell, the tissue, and the organ as well as for the organism as a whole. There are literally thousands of self-regulating mechanisms operative within the body at all times. These homeostatic mechanisms are essential for the maintenance of health, and if altered by disease or injury, they need to be restored. Our bodies have methods of protecting themselves from disease and other outside forces that might jeopardize their health. The body can make specific antibodies after exposure to an antigen (active immunity). It can detoxify ingested, inhaled, absorbed, or injected drugs and other foreign substances. When injury occurs, the body can usually compensate and continue on to sail through life safely, healthfully and productively. The body is dynamic and continually repairing worn out and injured cells. It is constantly repairing dysfunctions of joints, somatic tissues, and visceral organs. A neuromusculoskeletal component is present in every dysfunction or disease but may not be subjective. The goal should always be to enhance all of the body’s self-regulating mechanisms, to assist in the recovery from disease.10 (Osteopathic Principles in practise)

“Every nerve must be free to act and do its part” – A.T. Still

Dr. Still looked at the body and realized that most of the body – 60% is made of muscles and bones. He was puzzled why physicians only paid attention to this system when there was a tumor found in it, or it was fractured, cut, strained, or bruised. Dr. Korr, Ph.D., Physiologist, described the relationship of the musculoskeletal system to the viscera in this way; “The musculoskeletal system is not there just to carry around 30 feet of intestines, 60miles of blood vessels, the heart, lungs, and sex organs. It is there so that people can accomplish tasks, express themselves to others, and to show and tell others how they feel on the inside as well as on the outside. According to Korr, the integrated neuromusculoskeletal system is the “machinery of life”, A body with a structure as perfectly balanced as possible and a mind and a soul reacting to the stresses of life in a positive manner , is the foundation of integrative positive health.

“Man, the most complex, intricate and delicate structured machine of all creation is the one with which the Osteopath must become familiar” – A.T. Still

9 (Lisa DeStefano, 2011)
10 (Michael L. Kuchera, 1993)

Littlejohn, J. (n.d.).