Craniosacral Therapy….

What *is* it *Really?*

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Craniosacral Therapy (CST) is a light touch manual therapy that works with the body's self-correcting mechanism to affect multiple structural and physiological systems in attaining greater health and well being. As the name implies, it involves mobilizing restrictions within the cranium and the sacrum. However, because of the anatomical and physiological connections, it is really a whole body approach. It is practiced by various healthcare professionals including physical therapists.

History of Osteopathy

CST is born out of the osteopathic medical tradition. Osteopathy was developed by Andrew Taylor Still MD, a Civil War surgeon. Dr. Still found traditional medical practices of the time were often ineffective. These observations and experiences towards the end of the war culminated in the death of three of his children from spinal meningitis in 1864 leading Dr. Still to conclude that orthodox medicine could even be harmful. He devoted the remainder of his life to the study of the human body and developing alternative means of treatment for disease and dysfunction. His philosophy of treatment became known as Osteopathy.[1]

In 1892, Dr. Still founded the American School of Osteopathy, the very first school of osteopathy in Kirksville, Missouri. It is now named the A. T. Still University of Health Sciences. This new medical approach incorporated the core beliefs of Dr. Still and is based on three principles:[2]

1. Structure and Function are Interrelated

Each structure has a shape that supports its function. From the smallest organelle of the cytoskeleton to the arrangement of the various bones and organs within the body, all parts function in relationship to their structural formation. When a structure is compressed, over stretched or otherwise misaligned, function becomes impaired creating pain, dysfunction and even disease.

2. The Body is a Unit

All systems are connected to one another. The circulatory system serves all the other systems of the body. The nervous system receives information throughout the body and sends regulatory signals regulating physiological systems based on this sensory input. Fascia or the connective tissue matrix is continuous throughout the body and invests every other structure. Treatment methods based in osteopathy are often successful because of the ability of the practitioner to locate the origin of the problem which can be distant from the symptoms of the patient.

3. The Body is a Self-Correcting Mechanism

There is an innate ability of the human body to heal itself. Some practitioners refer to this part as the Inner Physician (IP). When the skin is lacerated, this self-correcting mechanism responds with an elaborate process to close the skin. Immune responses and inflammatory responses are also indicative of the body's self healing abilities. The osteopathic approach involves facilitating or enhancing the body's own natural capacity when traumatic or disease processes become overwhelming for the system.

History of Cranial Osteopathy

William Garner Sutherland DO attended the American School of Osteopathy. Fully embracing the concepts of Dr. Still, Dr. Sutherland was attracted to the unique shape of the cranial bones and their relationship with each other. It was at this time that he noticed the beveled shape of the temporal bones resembled the gills of a fish. Recalling Dr. Still's teaching that every structure exists to facilitate a specific function, Dr. Sutherland focused his interest on the cranium. He was the first to perceive a subtle movement at the cranium and later, to identify this same rhythm throughout the body. He named his finding the Primary Respiratory Mechanism. (PRM).[2] Dr. Sutherland developed techniques for treating restrictions between the cranial bones to facilitate motion at the sutures.[3] His concept and treatments were considered quite radical at the time and remained so up until the latter part of the 20th century. Western medical science has always taught that the sutures are fused and thus no movement is available. Dr. Sutherland's observations have been validated over time and with the development of technology to measure subtle movement and effects.[4]

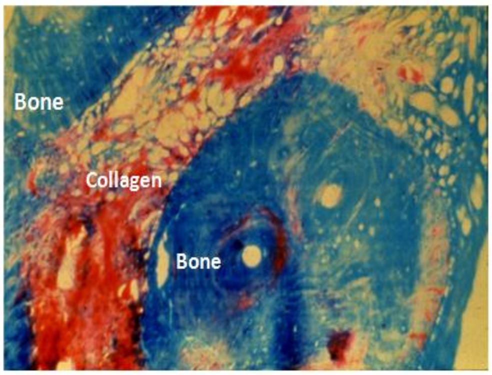

Figure 1a: Collagen within suture.

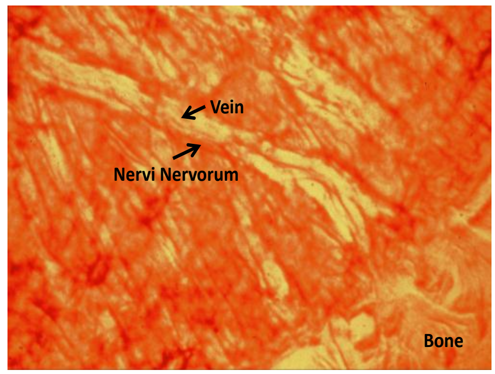

Figure 1b: Vein with nervi nervorum within suture.

The concept of cranial bone movement was further developed in the 1970's through the research performed by John E. Upledger and associates at the University of Michigan. At the time, Dr. Sutherland's theories and practices were seen as improbable and questionable at best by others in the osteopathic medical community. Dr. Upledger was invited to the University specifically for proving or disproving Dr. Sutherland's practice of osteopathy. His research focused on the movement of cranial bones at the sutures. Studies included the placement of antennae on the parietal bones of squirrel monkeys measuring movement of the paired bones.[5] Later, live sutural material was provided from a neurosurgical colleague that was stained for specific elements including collagen, nervous and vascular tissues.[6] (Figures 1a,b) It was reasoned that fused bones would not contain these features. In any event, these contents suggested that the cranial bones are not completely fused together. During this time other researchers were able to demonstrate that a rhythmic pattern of cranial bone motion exists at a rate different from other bodily rhythms. The most prolific studies supporting cranial bone motion were born out of the race to the moon between the United

States and Russia. Concerns relating to circulatory and central nervous system functions in the human subjected to prolonged weightlessness in space were of primary interest. Yuri Moskalenko, PhD led the Russian research using NMR tomograms and later using bioimpedance measures and transcranial Doppler echography. These studies demonstrated oscillations of the cranial bones associated with mechanisms regulating cerebral blood supply and oxygen consumption as well as with CSF circulation.[7,8]

Viola Frymann led the United States in researching cranial bone motion using a metallic tong-like device with a differential transformer placed laterally on each side of the cranium. Displacement of the metallic rod was converted into analog signals measuring skull diameter. The magnitude of motion was estimated to be between 10 and 30 microns.[4]

Later, Dr.'s Moskalenko and Frymann utilized their findings to formulate theories regarding the physiology of the craniosacral rhythm and published together.[9] Rogers and Witt in The Journal of Orthopedic and Sports Physical Therapy extensively reviewed the literature and concluded that "There is very little evidence which disproves cranial bone motion." However, they cited that "further inquiry is needed to describe its magnitude and meaning."[10]

Dr. Upledger expanded his research into other aspects of Dr. Sutherland's work including his Direction of Energy technique and energy transfer between patient and practitioner. These studies confirmed that energetic activity occurs but not in the exact way that Dr. Sutherland hypothesized.[11] In addition, Dr. Upledger developed an alternative theory to explain the fluctuation in motion at the cranium known as the Pressurstat model. This hypothesis was developed out of fresh cadaver dissection and examination of sagittal sutural material containing nervous tissue. In short, pressure and stretch receptors within the suture convey information to the choroid plexus within the ventricles creating an intermittent production and non-production of cerebrospinal fluid (CSF) while postulating that the reabsorption of CSF occurs continuously. It is this difference in fluid pressures that creates the widening and narrowing of the cranial bones associated with the craniosacral rhythm (CSR) or cranial motion.[12]

Another important contribution of Dr. Upledger's included the focus on the dura mater lining the interior of the cranium and the subsequent formation of the intracranial membrane (ICM) within the actual brain structure. He developed specific techniques to not only promote the release of sutural restrictions but to release restrictions within the actual dura and ICM.[3] Since the dura mater is a type of connective tissue or fascia and is continuous with the remainder of the connective tissue matrix, release of these restrictions can affect the function of distant parts of the body.[13]

The Anatomy of the Craniosacral System

As noted previously, the cranium is lined with dura mater which not only encircles the inner surfaces of the cranial bones but also folds in on itself creating the falx cerebri, tentorium cerebelli and the falx cerebelli otherwise known as the ICM. The firm attachment of the falx cerebelli at the foramen magnum of the occiput continues inferiorly with attachments on the posterior bodies of C1 and C2. It continues in the inferior direction without any attachments until it anchors at the S2 segment as the pia portion of the filum terminale within the sacral canal. It exits out of the sacral canal and continues as the external dural segment of the filum terminale blending with the periosteum of the coccyx. (Figures 2a,b,c) In addition, the dura mater extends out through the intervertebral foramina with the spinal nerves as the dural sleeves. The dural sleeves attach on the vertebral bodies blending with the paravertebral fascial tissue.[13] These anatomical attachments help give credence to the continuity of the fascia and why CST has such far reaching affects.

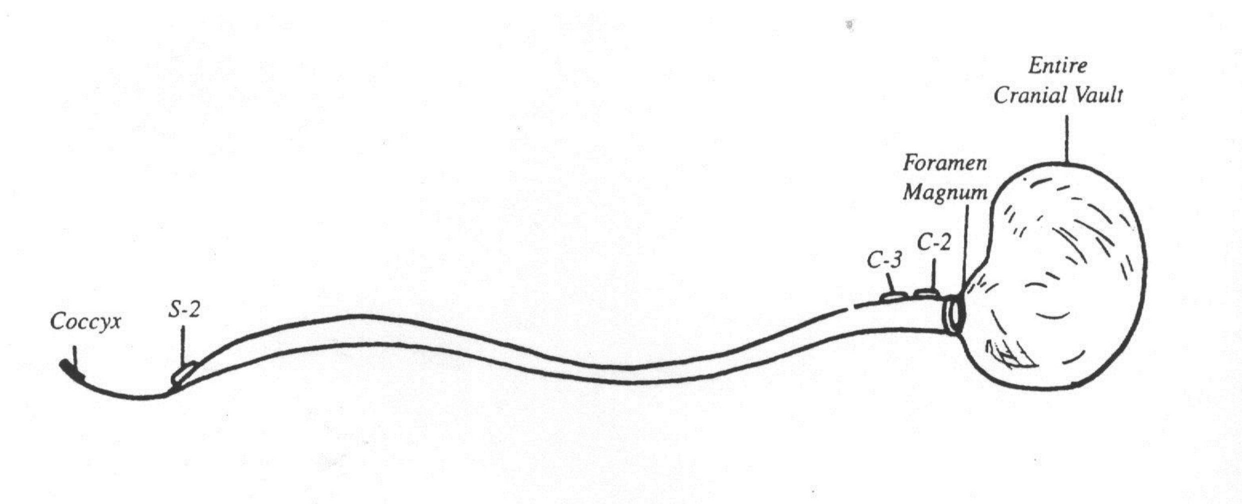

Figure 2a: Dural Attachments to Bone/Skull

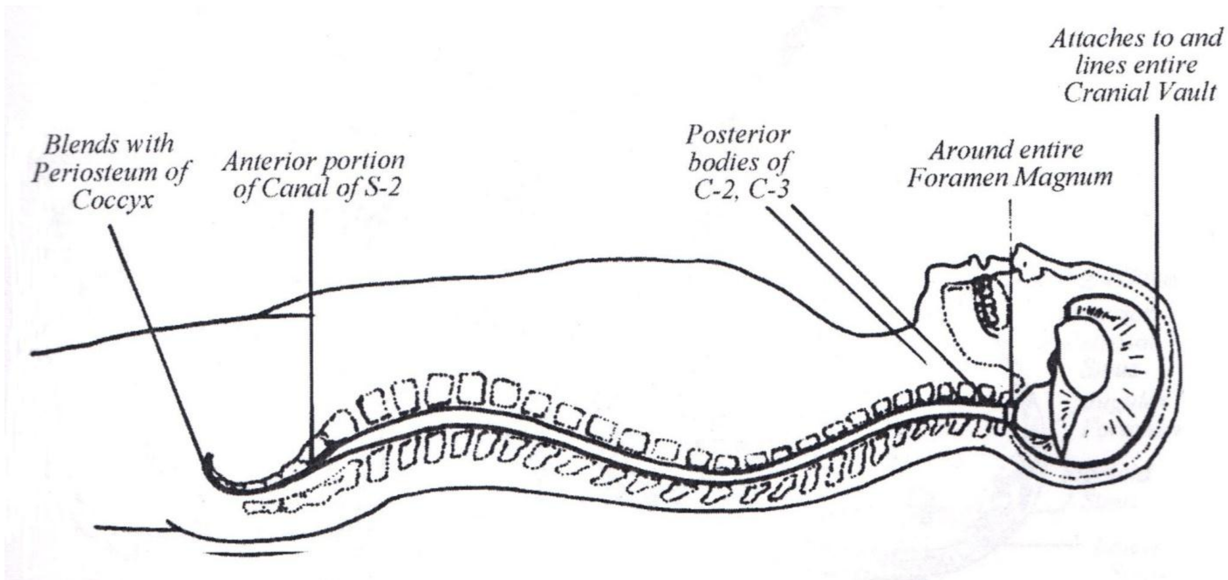

Figure 2b: Detail of dura attachments including intracranial membrane

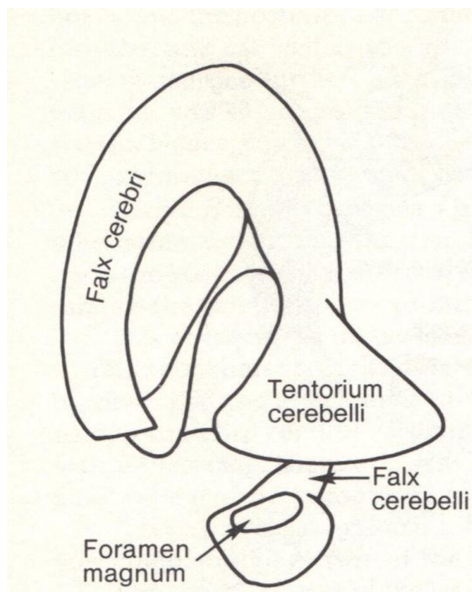

Fig 2c: Intracranial Membrane Detail

Enclosed within the CSS is the CSF circulating in the subarachnoid space of the meninges which is then absorbed through the pia layer of the meninges bathing the brain with nutritional elements necessary for proper brain function. Production of the CSF occurs through the choroid plexus where it is filtrated from blood supplied by the choroidal arteries into the ventricles of the brain. As previously noted, CSF supplies nutrition to the brain and spinal cord through its circulation in the subarachnoid space. Fluid exchange occurs through an active transport mechanism that results in metabolic waste products being reabsorbed by the arachnoid granulations within the venous sinus system of the brain. These waste products are emptied into the jugular vein. Some research suggests that small amounts of CSF drain through the spinal veins and through spinal lymph channels.[14] [15] The widening of the cranial bones during production of CSF is referred to as the flexion phase and the narrowing that occurs while production stops and draining continues is called the extension phase.[12]

The Fascial Connection

An important feature of CST is the attention given to the body's fascial system since the dura mater is the core of this system. This scaffolding network has been and is continually being researched.[16] [17] [18] The most important facts relating to fascia from a CST perspective are its tensile strength in the order of up to 7,000 pounds per square inch and its continuity throughout the body.[19] [20] Restrictive patterns within the fascia translate their forces in unique ways throughout the system. These unique patterns of adaptation are thought to be related to the pre-lesional state prior to a trauma such as a fall or car accident.[21] In other words, each trauma that the body is unable to dissipate will be adapted into the system in some way. When the body is overwhelmed with trauma or unable to adapt further, pain and dysfunction occur.

CST uses the palpation of the CSR throughout the body to locate and treat these restrictive patterns. Restrictions can reside within the cranium that over time are translated into distant parts of the body.[12] The opposite can occur as well. Restrictions in the head causing headaches may be related to fascial tensions within the mediastinal walls or respiratory diaphragm as this fascial plane continues in a superior direction as the pre-vertebral fascia attaching onto the sphenoid within the cranial vault.[22] [23]

Mary Ellen Clark, a former Olympic high diver recounts her experience of CST in a popular magazine. Suffering from vertigo, she was unable to pursue her dream of competing in the Olympic Games held in Atlanta. Although she had access to the latest in diagnostic technology and the best evidence-based treatments as a member of the elite athletic team, her symptoms persisted. At the suggestion of a friend, a skeptical Mary Ellen consulted a practitioner of craniosacral therapy. The therapist found multiple restrictions throughout the fascial system one of which included her right knee. Once, this particular area released, her vertigo began to subside. During the treatment, Mary Ellen was unable to recount any injury to her knee. Later, she recalled falling on her knee as a child. It is thought that the knee restriction translated forces over the course of 10 years into the tentorium cerebelli and dura mater lining the temporal bone. The inner ear mechanism is housed within the temporal bones and it is postulated that the restrictions were enough to alter the position of the temporal bone and create faulty feedback from the endolymph within the semicircular canals. Ms. Clark was able to return to competition and won a bronze medal for the USA after being treated with CST.[24]

In addition to the longitudinal planes of fascia, specific attention is given in CST to the planes of fascia oriented in a transverse direction.[12] These horizontal planes often absorb traumatic forces and create dysfunctions throughout the system. For example, the pelvic diaphragm is actually a fascial hammock attaching in an anterior/posterior direction from the pubic bones to the anterior surface of the sacrum and from side to side via the internal surfaces of the ilia.[22] Loss of mobility in this diaphragm can translate into the spine and hips and even further if enough time has elapsed. For example, because of the attachment of the dural tube at S2, torsion of the sacrum from the pelvic diaphragm can be translated up into the cranium. Failure to address these restrictive planes in therapy can result in temporary or limited improvement from traditional interventions.

Since CST is a therapy that focuses on the whole body and the interactions within it, it is not suited to traditional methods of study that are linear and reductionistic. Since present research skills have not yet developed to measure all of the influences that are interacting simultaneously during a CST session, case studies and case control studies are alternative methods of contributing to the literature supporting CST. Studies are available that have demonstrated the effectiveness of CST in patients with multiple sclerosis,[25] fibromyalgia,[26 27] lateral epicondylitis,[28] [29] asthma,[30] dementia[31] as well as a descriptive outcome study on patients with multiple diagnoses.[32]

As patients are becoming less inclined to embrace drugs and other treatment protocols that have limited or no effectiveness for their particular malady, they are more likely to search for other ways to solve their problem.[33] CST is a treatment choice that has been shown to be effective in a multitude of diagnoses by searching for and treating the origin of the problem.

For further information on research and classes in your area, please visit Upledger.com.

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