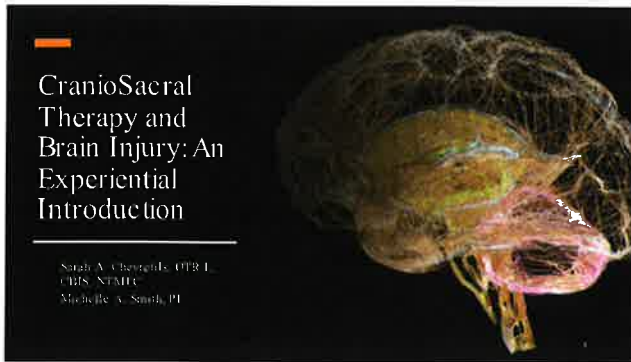
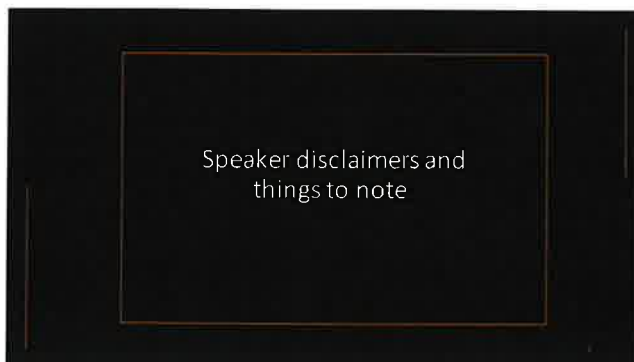








Session Objectives

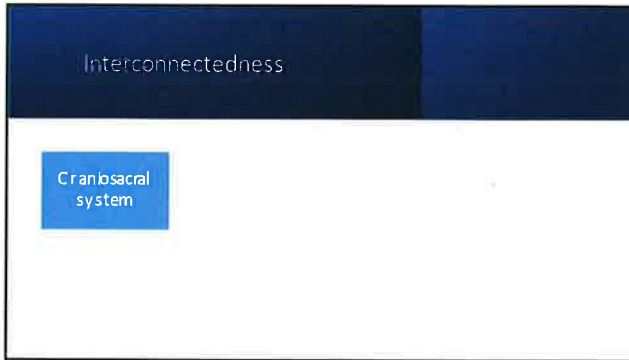
- Participants will be able to identify the main anatomical structures associated with the craniosacral system.
- Participants will trial palpation techniques for craniosacral rhythm (CSR) on selves or partner.
- Participants will be aware of recent research involving CranioSacral Therapy (CST) and Traumatic Brain Injury (TBI).
- Participants will consider clinical applications of CST as they pertain to specific case examples.
- Participants will identify at least two benefits of CST for individuals with TBI as well as identify contraindications for this type of therapeutic approach that are relevant for the population.

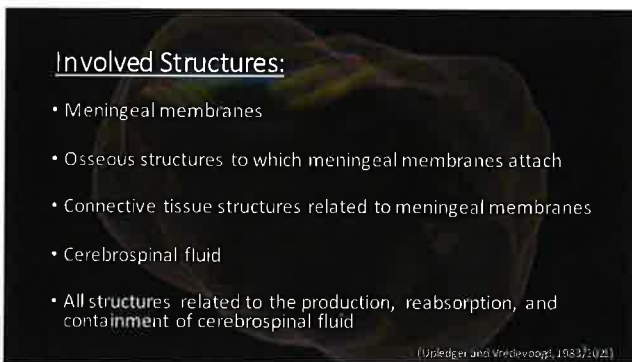
Who is familiar with CranioSacral Therapy?

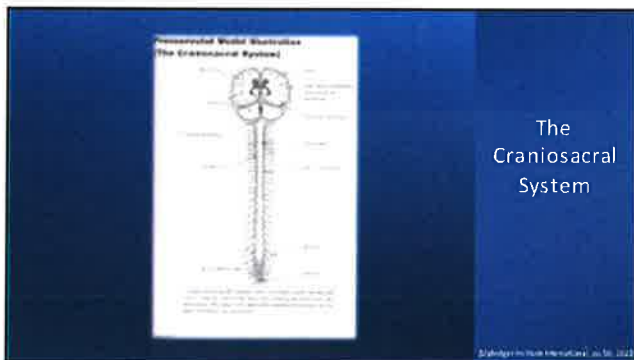
What is CranioSacral Therapy?

Gentle form of manual therapy or osteopathic manipulation in which restrictions in the dura mater are targeted through the movement of cranial bones and targeted changes to the craniosacral system

Can be completed by anyone trained in CranioSacral therapy techniques. Often PTs, OTs, Osteopaths, chiropractors, massage therapists, body workers complete continuing education in this area





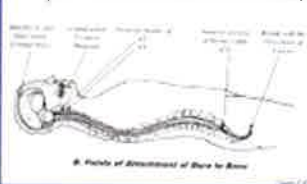


Anatomical Overview: CranioSacral System

- Semi-closed hydraulic system: dura mater membrane and its contents
 - Dura mater is firmly attached to cranial bones inside cranial vault
 - Bones become "handles" in treatment
- Fluid intake via choroid plexus (fluid from vascular system to ventricles in brain)
 - Cerebrospinal fluid (CSF)
- CSF returns to venous system by arachnoid villae

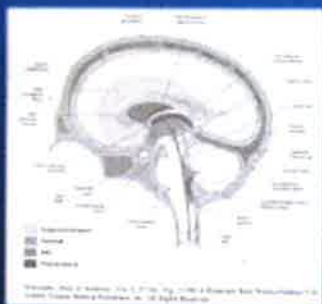
(Upledger and Vredevoogt, 1983/2021)

Points of Attachment of Dura to Bone (Detail)



Point of Attachment of Dura to Bone

(Upledger Institute International, Inc., 2021)



Cerebral Spinal Fluid (CSF)

Production and Circulation

(Upledger Institute International, Inc., 2021)

CSF Production



(Ash, 2003). Image included with permission from Don Ash, PT

CSF Reabsorption



(Ash, 2003). Image included with permission from Don Ash, PT

Contraindications for CranioSacral Therapy

• CST should not be used if there is concern for intracranial/intraspinal fluid pressure changes:

- Shunts
- Increased intracranial pressure
- Acute stroke
- Cerebral aneurysm
- Hemorrhage
- Herniated medulla oblongata
- Acute skull fracture
- CSF leak
- Myelomeningocele/spina bifida
- Arnold chiari malformation

• Precautions are taken with individuals who experience hypermobility (Ex: Down Syndrome, Ehler's Danlos Syndrome, Rheumatoid Arthritis, Chiari Malformation) for specific cervical releases in CST

• Recommend always clearing use of CST with referring MD for individuals who have experienced brain injury

(Upledger Institute International, 2022)

Principles for CST Approach

- ✓ 5 grams or less of pressure
- ✦ "grounded"
- ✦ Blend/meld
- ✦ Neutral approach
- ✦ Listening/following
- ✦ Assisting- facilitation



(Upledger Institute International, 2022)

CranioSacral Rhythm (CSR)

Like heart rate and respiratory rate, the craniosacral system has a palpable rhythm.

Builds off the theory that under normal conditions, the skull is in constant motion.



Workshop of CranioSacral Therapy
Principles and Techniques, 6.7.2022

(Upledger and Vredevoogd, 1983/2021)

Where can you feel
the rhythm?

- You can feel the CSR anywhere on the body
 - Head
 - Ankles
 - Thighs
 - Sacrum
 - Ear

(Upledger and Vredevoogd, 1983/2021)

CSR: Flexion and Extension

- Rocking motion of sacrum correlates to broadening and narrowing of transverse dimension of head
- As head widens, the sacrum moves anteriorly (**flexion, filling phase**)
- As head narrows, the sacrum moves posteriorly (**extension, emptying phase**)
- Let's see what this is like!
 - Balloon and string

(Upledger and Vredevoogd, 1983/2021)

The CSR

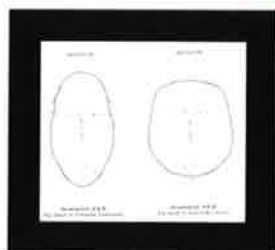


- 6-12 cycles per minute
- Contains flexion and extension phase with neutral zone (brief pause) before next cycle starts
- When assessing, we look at rate, amplitude, symmetry, and quality
- When injury is present, CSR can fluctuate significantly
 - 20-50 cycles/min
 - Lower amplitude
- Come due to anoxic and intercranial lesions resulted in CSR as low as 3-4 cycles per minute

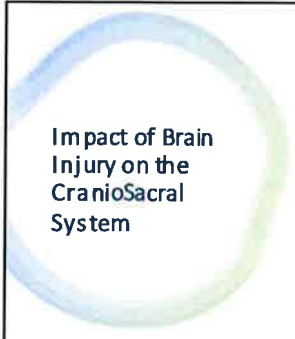
(Upledger and Vredevoogd, 1983/2021)

CSR Palpation

- Balloon with partner
- Feeling rhythm on self

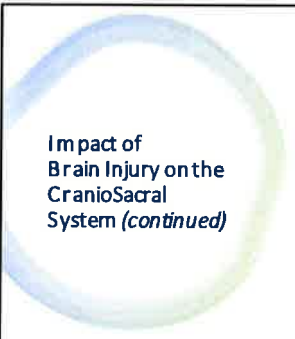


(Graphic: Upledger and Vredevoogd, p. 38, 2021)



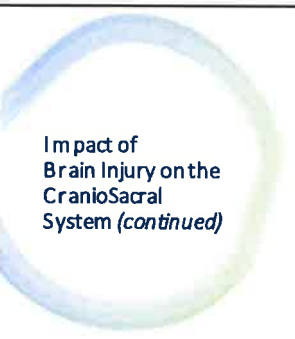
Impact of Brain Injury on the CranioSacral System

Impaired movement of CSF



Impact of Brain Injury on the CranioSacral System (continued)

Hyoid Restriction

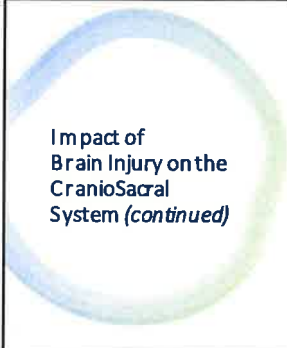


Impact of Brain Injury on the CranioSacral System (continued)

Dural Tube Restrictions

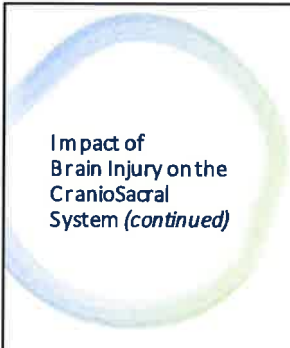
- We may see: Hyperkinesia, headaches and migraines, increase sympathetic responsivity, blood flow restrictions, "sacral concussions", psychological symptoms

Frontal Bone Compression



Impact of
Brain Injury on the
CranioSacral
System *(continued)*

Parietal Compression



Impact of
Brain Injury on the
CranioSacral
System *(continued)*

Temporal Compression



Evidence
Related to
CST and BI

- Susan Kratz, OT & Daniel Kratz (2021)
 - Looked at clinical outcomes (Post Concussive Symptom Checklist) for pool of clients who had sustained head trauma that did not require hospitalization through series of chart reviews
 - Clients reported CST positively impacted their post-acute and post-concussive syndrome symptoms
- Davis, Hanson, & Gilliam (2014)
 - Soldiers with chronic post-traumatic stress disorder and head injury participated in mixed light touch manual therapies (including CST as primary treatment modality)
 - Significant decrease in symptoms with relief lasting after treatment was administered

Evidence Related to CST and BI

• Haller, Cramer, Wener & Dobos (2015)

- Case study looking at the use of CST in inpatient setting with individuals who had experienced postoperative meningioma (tumor, L, parietal) and TBI (from cycling accident)

- Decrease in headache intensity, vertigo
- Improved cervical mobility, muscle tension, sleep quality, and well-being

• Wetzler, Roland, Fryer-Dietz, & Dettman-Ahern (2017)

- Case series looking at use of CST, Neural Manipulation, and Visceral Manipulation for retired professional football players experiencing post-concussive syndrome (PCS).

- Decrease in overall pain, cervicogenic pain
- Improved reaction time using the Dynavision Test and the memory test
- Improved cervical ROM
- Progressive improvement with hours of sleep

Evidence Related to CST and BI

• Harrison & Page (2011)

- Multipractitioner study using the Glasgow Homeopathic Hospital Outcome Score (GHHOS) to look at progress for clients with a wide range of symptoms.

- Showed improvements in headache/migraine, neck and back pain, stress, anxiety, and depression

- In the single-practitioner portion of sample, marked reductions in general practitioner visits maintained at the six-month follow-up

Additional Considerations

- Children and teenagers may be more susceptible to diffuse injury to brain and prolonged brain swelling after BI due to increased sensitivity to changes in cerebral blood flow and metabolic dysregulation

- Use of CST with this population can be very beneficial

- Several CST techniques are modified when used with children

[Chernick, 2011]

Case Example

John

- **PMHx:** 2014, Coup Contrecoup Injury: TBI and back injury resulting from dump truck malfunction
- **Specific Performance Skill Challenges/Symptoms:** multisystem challenges; visual dysfunction, vertigo, nausea, sensory dysregulation and significant hypersensitivities, brain fog, cognitive confusion, driving challenges, ANS dysfunction (thermal dysautonomia)
- **Changes seen with CST and other manual tx:** several years of tx; diminished head/neck/back pain, improved CN function; cognitive improvement (executive functioning, memory, attention)

Case Example

Mary

- **PMHx:** 42 yo status post-concussion with whiplash in 2019, complicated by recent diagnosis of Ehler's Danlos Hypermobility (EDS)
- **Specific Performance Skill Challenges/Symptoms:** neck and head pain, low back pain, referred into groin; double vision, oculomotor difficulties, visual processing challenges, vestibular challenges, tinnitus, dysautonomia, irregular heart rhythm, myofascial tension (cervical to cranial vault)
- **Changes seen with CST and other manual tx:** return to work (a paid job with computer work and traveling, improved activities of daily living and instrumental activities of daily living, now driving, reduced pain and headaches)

Case Example

Ella

- **PMHx:** 18m.o., mTBI x 2 from falls with occipital involvement, Alteration of Consciousness with second, baseline oculomotor challenges
- **Specific Performance Skill Challenges/Symptoms:** primitive reflex reemergence (ATNR, brief), motor planning dysfunction, increased oculomotor dysfunction, visual and vestibular processing challenges, developmental regression, mild tonal changes, headaches, neck pain, disturbed sleep, increased reliance on caregivers for self-regulation, dfl CSR
- **Changes seen with CST and other manual tx:** improved motor planning, balance, vestibular processing, oculomotor skills (convergence, tracking, fixation, endurance), on target with motor milestones

Utility of CST in Brain Injury Recovery:

What are the benefits?

- Complements medical model treatment well
- Releasing dural restrictions, associated forces on cranial nerves, and improving CSF flow can result in symptom reduction for individuals experiencing brain injuries
- Therapy may help address chronic symptoms for some individuals who have discontinued traditional treatments





Questions?

Thank you!

CRANIAL NERVES

QUICK REFERENCE

**CNI:
OLFACTORY**
Smell



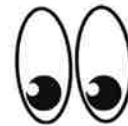
CNII: OPTIC
Vision



CNIII: OCULOMOTOR
Eye movement,
blinking



CNIV: TROCHLEAR
Move eyes up and
down, back and
forth



CNV: TRIGEMINAL
Facial sensations,
taste, jaw
movement



CNVI: ABDUCENS
Eye movement
(outward gaze)



CNVII: FACIAL
Facial expressions,
taste



**CNVIII: AUDITORY/
VESTIBULAR**
Hearing, balance



**CNIX: GLOSSO-
PHARYNGEAL**
Taste, swallow, ear
and throat
movement



CNX: VAGUS
Digestion & Heart
Rate, sensation
around the ear,
motor activity in
throat



**CNXI: SPINAL
ACCESSORY**
Shoulder and neck
muscle movement



**CNXII: HYPO-
GLOSSAL**
Tongue movement



Discover
CranioSacral Therapy
the Healing
Power of
Gentle Touch



What Conditions Can CST Help?

CranioSacral Therapy improves your body's ability to take better care of you. It has been shown to help a full spectrum of pain and dysfunction, including:

- Migraines and Headaches
- Chronic Neck and Back Pain
- Stress and Tension-Related Disorders
- Motor-Coordination Impairments
- Infant and Childhood Disorders
- Spinal Cord Injuries
- Post-Concussion Symptoms
- Chronic Fatigue
- Fibromyalgia
- TMJ Syndrome
- Scoliosis
- Central Nervous System Disorders
- Learning Disabilities
- ADD/ADHD
- Post-Traumatic Stress Disorder
- Orthopedic Problems
- And Many Other Conditions



The Body Is a Self-Correcting Mechanism.

There is an innate ability of the human body to heal itself. Some practitioners refer to this as the Inner Physician. 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. CranioSacral Therapy involves facilitating or enhancing the body's own natural capacity to heal when trauma or disease processes become overwhelming for the system.

"People have a belief that life is difficult and healing is painful. CranioSacral Therapy helps them let go of that belief. The healing process can be much more gentle and subtle." — S.H., Abbeville, LA

Why is CranioSacral Therapy so Important?

CranioSacral Therapy (CST) is a light-touch approach that can create dramatic improvements in your life. It releases tensions deep in the body to relieve pain and dysfunction, and improve whole-body health and performance.

Few body structures have more influence over your health and well-being than your central nervous system. And few body systems have more impact on your central nervous system than the craniosacral system—the soft tissues and fluid that protect your brain and spinal cord.

You endure stresses and strains, and your body absorbs them. But your body can only handle so much tension before the tissues begin to tighten, and potentially affect the brain and spinal cord. Unfortunately, this can compromise the function of the central nervous system and nearly every other system in your body.

CST releases those tensions to allow the entire body to relax and self-correct. Using a gentle touch, starting with about the weight of a nickel, practitioners evaluate you for strain patterns. Then they use distinctive light-touch techniques to release any restrictions they find.

By freeing the central nervous system to perform at its best, CST has been shown to naturally reduce pain and stress, strengthen your resistance to disease and enhance your health and well-being.

And because it's so gentle, CST has been shown to be effective for all ages, from newborns to elders.

How Did CranioSacral Therapy Begin?

CST was pioneered and developed by osteopathic physician John E. Upledger. Dr. Upledger served from 1975-1983 as a clinical researcher and Professor of Biomechanics at the College of Osteopathic Medicine at Michigan State University. It was during those years that his team of anatomists, physiologists, biophysicists and bioengineers was tasked with performing experiments to test the existence and influence of the craniosacral system.

The results of those scientific studies explained the function of the craniosacral system, and its use in evaluating and treating poorly understood malfunctions of the brain and spinal cord.

Dr. Upledger went on to develop CranioSacral Therapy and other complementary modalities that are now taught worldwide to healthcare professionals through Upledger Institute International's educational programs.

What Can I Expect From a Session?

A typical CranioSacral Therapy session takes place in a quiet, private setting. You remain fully clothed as you relax on a comfortable, padded table.

Your therapist begins by gently touching various parts of your head and body to monitor the rhythm of the fluid that is flowing around your central nervous system.

By carefully listening with the hands to locate areas of weak fluid flow or tissue motion, your practitioner can trace those areas of weakness through the body to the original source of dysfunction.

Delicate manual techniques are then used to release those problem areas, and improve the form and function of your central nervous system.

A CranioSacral Therapy session can last up to an hour or more. It can be used alone or integrated with other therapies to facilitate powerful changes.

What you experience from your own session is highly individual. The sessions are generally deeply relaxing, creating feelings of warmth or gentle pulsing in the areas the therapist is working on.



John E. Upledger
DO, OMM

"I have had extraordinary results from the CranioSacral Therapy. I have suffered from clogged ears, and extreme pressure and tightness in my upper abdomen for almost two years. My jaw and neck muscles would occasionally spasm and my throat would tighten.

I was short of breath most of the time—miserable and desperate. For the first time in almost 2 years, I slept the whole night without a pill, and woke up without tremors and that dreadful body pressure. I am a 38 year old woman and for the first time in almost two years, I have lived one day as a normal human being. That is a quantum leap for me."

"Our son was diagnosed with torticollis at 2 months old. We are happy to report that he is responding quite well to the treatment! Not only is his head straighter, but he is a much happier, calmer baby than he was five weeks ago. We learned that his colic was related to the torticollis. Since getting CranioSacral Therapy, his symptoms have almost completely gone away."



The Upledger Institute International is endorsed by
the International Alliance of Healthcare Educators

If you have any questions, please consult your physician or ask your practitioner.

DISCOVER

Integrative Treatment assists with Concussion and Traumatic Brain Injuries

CRANIOSACRAL THERAPY

NEURAL MANIPULATION

VISCERAL MANIPULATION



"I've suffered numerous concussions over the years and developed hydrocephalus while playing in the National

Football League (NFL). During the 1981 season, I underwent emergency Ventriculoperitoneal (VP) Shunt brain surgery. I've now survived 9 brain surgeries and several grand mal seizures.

I had been suffering from constant headaches, major neck and back pain from fractured vertebrae, short-term memory issues, tinnitus and a "frozen shoulder," which was scheduled for major reconstructive surgery.

I participated in an Intensive Therapy Program at the Upledger Institute in July 2014, which included CranioSacral Therapy (CST), Neural Manipulation (NM) and Visceral Manipulation (VM). The results were incredible.

My headaches and tinnitus subsided by the second day of the Intensive, my neck pain and back pain is now nearly gone, and I have full range of motion in my shoulder. I've indefinitely canceled my shoulder surgery and continue to receive CST and the other treatments on a maintenance schedule.

Upledger CST combined with Barral NM and VM can be very effective. It has improved my quality of life better than any treatment I've received in 30+ years. I have recommended these therapies to all of my associates."

—George Visger, San Francisco 49ers
1980 - 1981; Super Bowl Champion

What is a Concussion or Traumatic Brain Injury?

Depending on the amount and direction of the force, vasculature to the brain tears and internal bleeding occurs. Also damaged are the neurons, neural centers and glial tissue which support the various brain structures. Repeated blows to the head, at any age, can lead to chronic traumatic encephalopathy (brain damage or malfunction). Symptoms may not show up until later in life. This is referred to as post-concussion syndrome.

Symptoms are wide ranging and can affect an individual in a variety of ways. Physically, there may be headaches, neck pain, as well as other seemingly unrelated pain syndromes and system disorders. For example, damage to the pituitary gland or surrounding tissues may affect endocrine (hormone) function. Other common physical symptoms include dizziness, tinnitus, double vision, sleep disorders and fatigue.

Emotionally and behaviorally, a person may become more irritable and aggressive. Anxiety, depression, apathy and other changes in personality may also occur. Cognitive dysfunction may exhibit itself with difficulties in concentration and memory.

Why Do Concussions and Traumatic Brain Injuries Require a Full Body Treatment Approach?

All of the major systems in the body - musculoskeletal, nervous, circulatory, digestive and visceral (organs) - are enveloped in connective tissue called fascia. Characteristics of a healthy connective tissue system are flexibility, elasticity, length and resilience. This tissue absorbs and responds to stress, injury, surgery, illness, poor posture, emotional trauma and everyday gravitational force. Any of these factors will immediately, or over time, cause an imbalance in the connective tissue system. This imbalance is seen as a shortening, thickening, dehydration of the tissue, which impairs muscle function and joint mobility, along with affecting the function of organs and the systems of the body.

Tension patterns form through the fascial network deep within the body, creating a cascade of effects far from their sources, for which the body will have to compensate. This creates fixed, abnormal points of tension that the body must move around. This chronic irritation gives way to functional and structural problems. This is usually experienced as pain, decreased flexibility, impaired movement and dis-ease of varying sorts.

Because of the continuous nature of these connective tissues, no distortion or imbalance can remain localized. For this reason, the initial cause of a person's pain or dysfunction can often be far removed from the site of the symptoms. Consequently, any treatment to one area may facilitate changes in other parts of the body. As that old song goes, the head bone is truly connected to the thigh bone.

How Will CST, NM and VM Benefit Me Now and Long-Term?

Many patients report experiencing immediate improvement after an integrative treatment utilizing these modalities. Commonly reported benefits include a reduction in headache pain, decrease in mental foginess, improved mental clarity, increase in cervical range of motion and improved feelings of well-being.

When done correctly, these techniques often yield ongoing positive results with no negative side effects. Short-term benefits may occur in as few as one to five sessions, whereas long-term results may require more frequent or longer sessions. Recovery from a head injury is a complicated process that does not typically occur overnight. When CST, NM and VM are incorporated consistently throughout the rehabilitation process, long-term benefits and the potential of full recovery are maximized.

When Should I Include CST, NM and VM into My Treatment Protocol?

CST, NM, and VM can be integrated into the treatment plan soon after injury with clearance from the primary physician. Integration of the treatment modalities is highly beneficial even years after the original injury. Clinical experience has shown great improvement for people - no matter when their injuries began.



"I'm in a very interesting position because I've been a football player, but I've also studied these therapies - so I know from my own experience that they work and can really help."

— Ricky Williams, two-time All-American and Heisman Trophy Winner.

Integrative Manual Therapies

Post-Concussion Syndrome and associated symptoms have been shown to clinically respond to CranioSacral Therapy (CST), Neural Manipulation (NM) and Visceral Manipulation (VM). These manual therapies continue to generate interest and scientific investigation as a viable adjunct in the care of individuals experiencing the adverse effects of post-concussion syndrome. These manual therapies affect the body deeply and assist the healing forces already at work. When the body is no longer bound by restriction along the fascial system, it can move with greater ease, readily adapt to its environment and thus have a greater expression of health.

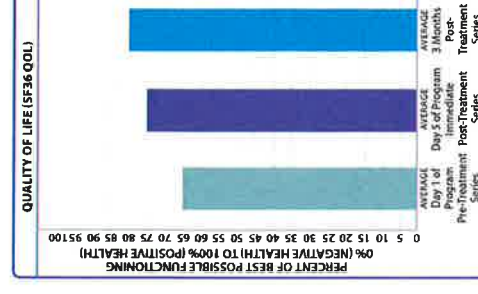
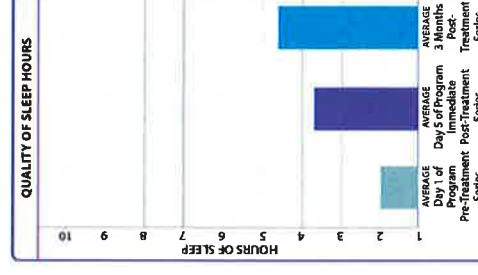
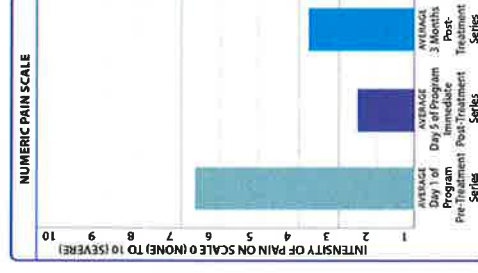
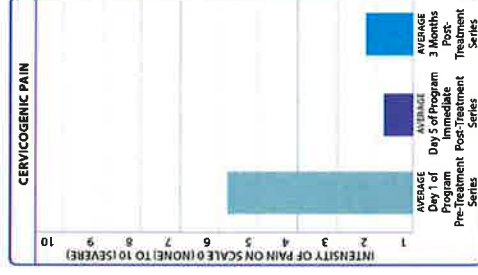
CranioSacral Therapy is a light-touch, whole-body treatment technique that works with the body's craniosacral system to support and nourish the central nervous system — improving overall health and well-being. By freeing restrictions within the central nervous system, CST naturally reduces pain and stress, strengthens resistance to disease and enhances health and well-being.

Neural Manipulation is a light-touch, hands-on treatment that releases local nerve restrictions while at the same time examining the effect these local fixations have on the rest of the body, and resolves the more comprehensive (global) dysfunctional

patterns. NM aims to free tissue restrictions within the central and peripheral nervous systems. NM can enhance proper functioning of the nervous system - one of the communication highways throughout the body.

Visceral Manipulation is a gentle manual therapy that assesses the structural relationships between the viscera (organs), and their fascial or ligamentous attachments to the various systems in the body. It assists functional and structural imbalances

throughout the body including musculoskeletal, vascular, nervous (including the autonomic nervous system), urogenital, respiratory, digestive and lymphatic dysfunction. VM increases proprioceptive communication within the body, something that can be severely stunted after a traumatic brain injury.



Results from Dr. John E. Upledger Foundation and Ricky Williams Foundation Concussion Research Program

Former professional football players were treated with CranioSacral Therapy, Neural Manipulation and Visceral Manipulation during week-long Intensive Therapy Programs. The results showed a significant decrease in symptoms associated with depression and a decrease in cervicogenic pain. The results also clearly showed improvement in the average number of hours able to sleep per night and an increase in the quality of life. Full details can be found at Upledger.org.

Effective Treatment

The prevalence and seriousness of concussions and head injuries has reached a heightened awareness among professional, amateur and student athletes. As reports of headaches, memory loss, depression, sleeplessness and debilitating pain mount, focus is being placed on effective treatment options.

Medical approach has been to detect and diagnose concussions and traumatic brain injuries (TBI), with the standard of care being 'watch and wait,' unless surgery is required. New attention is being given to manual therapies capable of accessing and addressing the vascular, structural and neurological tissues of the brain, as well as the far-reaching ramifications throughout the body.

Concussion affects the structures of the nervous system including the glial cells which are the glue or supporting matrix of the structures of the brain. This glial matrix is similar to the connective tissue called fascia. Trauma affects the bones of the cranium and the connective tissue lining the inside of the skull bones, as well as the sensitive brain tissue. It is suspected that the positive outcomes experienced with manual therapies, such as CranioSacral Therapy, Neural Manipulation and Visceral Manipulation, in post-concussion syndrome are the result of affecting not only the cranial bones and the connective tissue inside these bones, but also the glial network attaching directly to the brain structures.

"For me, CranioSacral Therapy, Neural Manipulation and Visceral Manipulation have been key elements in unwinding and releasing old pain. The Upledger and Barral therapists have facilitated an inward journey that has taken me to the core of my being, at the physical, mental and emotional realms, where the old contractions from years of hard driving and pounding had lodged.

My short-term memory and cognitive processes are once again fully in line. My moods and outlook have regained stability and balance. My body is pain free, and the issues I struggled with for so long from a lumbar spinal fracture have completely resolved. These gentle modalities have the ability to save and transform lives. They are firmly grounded in the science and biology of human nature. They are inexpensive, non-invasive and have no negative side effects. They have a 30+ year track record of helping people from all walks of life with a myriad of physical, emotional and psychological pain."

*— Markus Koch, Washington Redskins,
1986-1991; two-time Super Bowl Champion*



Endorsed by the International
Alliance of Healthcare Educators.

If you have any questions, please consult your
physician or ask your practitioner.

*"I have felt continuous improvement
with CST. Since the Intensive this
summer, I went without a headache
for an entire month, the first time this
has happened in 15 years."*

— K.C.