

Non-traditional Applications of MLD; an op-ed

By Louisa Boyd OTR/CLT-LANA

“We strike at the source of life and death when we go to the lymphatics.” A.T. Still

Many of us who practice as Lymphatic Specialists, will often have our patients tell us that the reason they come to us for therapy is not necessarily the reason why they keep coming back. Some of the feedback I have received from patients range from being able to sleep better to a feeling of calmness or more energy. They also will report being able to breathe better and even think more clearly. This leads one to ask, what else is manual lymph drainage (MLD) impacting within the brain and body of our clients?

Although MLD has, for most of us, been the intervention of choice for stimulation of the lymphatic system to accelerate lymph drainage treating of lymphedema. There is growing research and evidence to support some of the dramatic side effects that our patients describe.

The method of MLD was invented by Emil and Estrid Vodder in 1936. However, lymphatic stimulation was also conceived using osteopathic manipulation techniques by A.T. Still in 1874 and Earl Miller in 1920. However, the concept of the cerebral spinal fluid and its connection to brain lymphatics is also not so recent. Heinrich Quincke, William Sutherland, John Upledger and Bruno Chikley are pioneers in the realm of these treatments.

Heinrich Quincke, also known for the lumbar puncture procedure, was the first to ponder the impact of psychomotor activity on CSF transport since most experimenters use anesthetized and/or immobilized animals. "In his studies from 1872, Quincke confirmed that CSF moved (and transported particulate matter) from the lumbar intrathecal sac towards the brain as well as along peripheral and cranial nerves.

One of Dr. William Sutherland's theories of "a cranial sacral rhythm and a fluid wave within the CSF that bathes the brain and spinal cord" was met with ridicule and protests in his book published in 1939 called "The Cranial Bowl." Today his work is well regarded and credited.

John Upledger was an osteopathic physician most noted for the "Cranial Sacral Therapy" or CST. The concept of CST is to treat the CNS by releasing restrictions using manual therapy techniques with a touch no greater than the weight of a nickel. This treatment also has a reported beneficial effect on enhancing the immune system as well as reducing anxiety and depression. To date, CST is indicated for a host of conditions, including sleep disturbance, autism, migraines, Alzheimer's Disease, Chronic Fatigue, and Head Injuries.

With the higher technology used to confirm the existence of brain lymphatics, harnessing the drainage of the brain lymphatic system has become the new frontier. As lymphatic specialists, can we now take what we know, apply these methods and techniques that have served us, and find efficacy for treating

neuro-Inflammatory conditions where once were told “nothing can be done?” Remember when lymphedema was a condition that was labeled similarly? We have cracked that myth and are now so much more empowered with lymphatic diagnostics, complementary treatments, advanced therapy technologies, as well as lymphatic surgeries and procedures. Everything I have read and studied in this genre of neuro-lymphatic therapy has supported my belief that we can provide an avenue to enhance both brain and body fluid dynamics. So let us look at some of the research that demonstrates MLD’s effects that might marry techniques and approaches.

My first opportunity to link the methods of osteopathy and MLD was to work in a clinical setting with experts on the methods of osteopathic manipulation and lymphatic pump techniques. Dr. Judy Barrett and Dr. Tim Barrett have been working in the field of using cranial sacral therapies and techniques for over 30 years. They frequently teach master courses to osteopaths and clinicians. I can attest to the healing properties of the team.

While attending the 2019 NLN conference, the keynote speaker, Carmen Recupero, B.S., LPTA, LMT, MBA, and founder of Monarch Continuing Education, presented her work on applications of neuro-lymphatics and the results of her treatment protocol. She had worked with the University of Virginia neuroscientists to map the brain lymphatic drainage route and then created her own multi-modal treatment protocol. After taking her class, the patients I was able to treat in this method have had profound experiences, if only in the short term. Many of my patients reported chronic and unyielding headaches and with the treatment, had experienced up to two weeks of relief which allowed them to enjoy life and to participate in school, work, and recreational activities.

*“The lymphatics are closely and universally connected with the spinal cord and all other nerves, and all drink from the waters of the brain.” (“CS-Lymphatic Integration
“CLI Class” - CST-Alliance”) A.T. Still*

Brain Lymphatics and CSF Drainage

In the published article “The Glymphatic System-A Beginner’s Guide” it gives a tutorial on the brain waste clearance system using the perivascular channels the elimination of soluble proteins and metabolites from the CNS via CSF. Notably, the inability to clear neurotoxic waste products, such as Amyloid Beta proteins, that maybe responsible for neuro-inflammatory conditions such as Parkinson’s Disease and Alzheimer’s Dementia. The glymphatic system is most active in the elimination of waste during the sleep cycle and disengaged during the wake cycle. Interestingly, the body’s lymphatics are most active during the wake cycle and the body’s muscle pump function aids in the propulsion of lymph drainage. CSF and Interstitial fluid continuously interchange. This exchange happens by the convective influx of CSF along the periaxonal spaces of the brain in combination of arterial pulsations, respiration, and CSF pressure gradients. The transport of CSF from the AQP4 water channels moves into the parenchyma and drives convective interstitial fluid within the tissue toward the perivenous spaces surrounding the large deep veins. The ISF is collected and drains out of the brain toward the cervical lymphatic nodes. We call this the glymphatic system. Glymphatic transport is driven by convective flow through the brain parenchyma and the exit of ISF through the perivenous spaces into the cervical lymphatic system. The production of CSF in the choroid plexus creates a pressure that drives the flow or

fluid into the subarachnoid space as well as the force of respiration and arterial pulsations.

In the research article “Brain Ventricular Volume Changes Induced by Long Duration Space Flight,” it looked at the condition Space Associated Neuro-Ocular Syndrome. It found that the shift of CSF circulation from micro-gravity was the cause. Real-time MRI findings show that forced inspiration drives CSF along the spinal column towards the brain and ventricles against hydrostatic pressure. During deep expiration, the CSF is driven caudally into the spinal lumbar region using hydrostatic forces. Our standard practice of diaphragmatic breathing in our MLD sequence certainly mimics this effect.

In the study, “Outflow of CSF is Predominately Through Lymphatic Vessels and is reduced in Aged Mice”, they used NIR tracers with high resolution imaging to track CSF drainage and find the most important drainage routes. They found that within 30- 60 minutes, tracers were found in peri-neural routes to reach the lymphatics and that fluid dynamics were slowed in the aged mice. They found tracers at the optic and trigeminal nerves as they exit the skull, the cribriform plate that separates the brain and nasal cavities and the lymphatic vessels surrounding the orbit of the eyes. They also exposed the deep cervical region where Cranial nerves 9 (glosso-pharyngeal), 10 (vagus), and 11 (accessory) emerge and drain into the deep cervical nodes. They also found tracers where the Cranial nerve 7 (facial) exits and drains in the mandibular and deep cervical nodes. Although this study is in mice, the human biology and circulatory structure are very similar. Could our practice of stimulation of the MLD for the head and neck also be assist in lymphatic drainage?

Autonomic Nervous System

Both MLD and Osteopathic Manipulation techniques report the benefits of soothing the autonomic system and stimulating the parasympathetic system, thus providing reduced tension, sleep disturbance, and headaches.

In a 2020 study on healthy subjects, Dr. Chikley’s lymph drainage therapy technique, after 45 minutes of LDT, the study participants had an increase in H reflex (motor neuron excitability) and a reduction of SLR (muscle tension.)

In the study “Effectiveness of an osteopathic treatment on the autonomic nervous system: a systematic review of the literature”, 23 published studies were used to test the efficacy of differing osteopathic techniques on the ANS. High Velocity low amplitude (HVLAT) and work in the sub-occipital region did show an effect on ANS activation but none of the studies could indicate whether this activation occurred in the sympathetic or parasympathetic nervous system.

In the article “Investigation of lesser-known effects of Manual Lymph Drainage: A Narrative Review”, it found that MLD increases blood flow without causing an increased tissue fluid, but also how it soothes the autonomic nervous system by MLD’s its effect on the smooth muscles of the lymph collectors, which are innervated by the sympathetic part of the autonomic nervous system. It will reduce the firing of this system and will in-turn dilate, and fill the lymph vessels.

Based on these three studies, the effect of MLD as well as a focus on sub-occipital treatment, such as

stimulation of the occipital lymph nodes, may also have a beneficial effect on the ANS as well as brain lymphatic drainage.

Pain

In the 2019 Lymphatic Research and Biology journal article, “Does Manual Lymph Drainage Have Any Effect on Pain Threshold and Tolerance To Different Body Parts?”, studied the effect of MLD on 30 healthy participants. They found a significant increase in the pain threshold in both the upper and lower extremities.

In the journal article “Manual Lymphatic Drainage for Breast Cancer-related Lymphedema: A Systematic Review and Meta-analysis of Randomized Controlled Trials” they found that in breast cancer-related lymphedema patients, the meta-analysis found that MLD did have a positive effect on pain relief.

Also found in the Journal of Lymphatic Research and Biology article on “Less Known Effects of Manual Lymphatic Drainage” stimulation of the touch receptors along the spine will result in pain inhibition by affecting the key cells of the pain pathway in the spinal cord. In addition, by stimulating the adjacent touch receptors through the stroking movement, the inhibition effect will be stronger. Perhaps the stimulation of the paraspinal lymphatics is also inhibiting pain in this fashion.

As for Cranial Sacral Therapy, a metanalysis study published in 2019 looked at 10 RCTs with a variety of CST methods and chronic pain conditions. They found short term benefits on pain intensity and physical disability. Due to the variety of techniques and protocols in the studies, it leaves us with more questions than answers as to which techniques were most beneficial.

Fatigue

In an article from the Journal of Osteopathic Medicine in 2007, before the confirmation of the lymphatic system imaging, the author, Dr. Raymond Perrin, proposes a theory on the pathogenesis of chronic fatigue syndrome and his treatment approach, The Perrin Technique. The background argument is that there are disturbances in the Cranial Rhythmic Impulse (aka cranial sacral rhythm) and lymphatic disturbances that lead to congestion. These can occur from mechanical disturbances of the cranium and spine due to traumatic injuries or postural deficits. He provides a 6 stage protocol for neuro-lymphatic drainage combining lymphatic drainage techniques to the cervical and central lymphatics, mobilization to the spine and ribs, soft tissue mobilization to the posterior trunk, and stimulation of the cranial rhythmic impulse. The patient is also encouraged to participate in thoracic mobilization exercises. He mentions that manual techniques such as those that stimulate the abdominal and thoracic pump as well as the Vodder technique for lymphatic drainage aids in the propulsion of lymphatic decongestion.

In the 2022 article, “Reducing fatigue-related symptoms in Long COVID-19: a preliminary report of a lymphatic drainage intervention”, the Perrin Technique was utilized in patients experiencing chronic fatigue after Covid 19 infection. Their theory is that the virus impacted damage to the olfactory sensory neurons, thus affecting lymphatic drainage with subsequent toxic build-up within the CNS. In the measure of the PFRS (Profile of Fatigue Related States) they found that patients had reduced fatigue, malaise, mental fatigue, and depression. They had improved concentration, back pain, and restorative sleep. The participants also participated in a home self-manual lymph drainage program. Although this is a small study, it shows promise in the use of non-pharmaceutical and noninvasive treatment

opportunities for the future.

Conclusion

At the beginning of this article, I referred to training under two expert clinicians in cranial sacral therapy and osteopathic manipulation techniques. I wanted to get the opinion of Dr. Judith Barrett, a Doctor of Physical Therapy as well as a certified lymphedema therapist and cranial sacral therapy master trainer.

Question: As a CST expert trainer and Lymphedema Specialist, do you find that CST and MLD have commonality?

Dr. Barrett: Craniosacral therapy and manual lymphatic drainage complement each other well. CST gently aids the body in decreasing the number of fascial restrictions present and allows the lymph to flow. MLD encourages that flow, showing the body what it can still do and encouraging it to take alternative routes and make them more effective when the original route is impaired. When performed together, these techniques are a powerhouse combination.

Question: What technologies do you find promising to complement the practice of CST and osteopathic manipulation techniques?

Dr. Barrett: Since craniosacral therapy assists the body, helping the brain to reset and find ways to allow motion where motion was previously impaired or absent, modalities that encourage flow or motion are a great follow up. Prior to treatment the body has been following a less than optimal strategy for dealing with an impairment. After treatment, the body has been encouraged to perform more optimally. But bodies like old habits. In order for the body to practice more effective methods of moving fluid, following up with modalities that encourage lymph flow is vital. Negative pressure devices, electric shockwave, deep oscillation, percussion, and vibration facilitate the movement of lymph and provide the practice the body needs to maintain a more optimal lymphatic flow.

I feel we are just scratching the surface when it comes to all the applications in which our clinical skills are affecting our patients in ways we have yet to understand. It is exciting and empowering to all of us who seek to improve the quality of lives of our patients.

I am very excited to see the implementation of modalities that facilitate what our hands alone cannot achieve, such as deep oscillation, pulsed magnetic field therapy, and negative pressure to facilitate central lymphatics.

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About Louisa Boyd

Louisa Boyd OTR/CLT-LANA is an Occupational Therapist specializing in lymphedema, breast cancer rehabilitation, and neuro-lymphatic therapies. She is also known for lobbying to create training for standardized manual therapy force and pressure measurements. She owns nPress Clinical Training, which highlights training on modalities that enhance manual therapies. She is an ambassador for the National Lymphedema Network and co-hosts the modalities discussion group and micro-conference. She has served as a board member for the Lymphology Association of North America (LANA.)

