

Osteopathic Considerations for Influenza, Pneumonia and the COVID-19 Pandemic

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“ ... Herein lies your hope... Remove the obstruction, restore the circulation to and from the parts and your work is done and you have your reward.” – Dr. A.T. Still writing on Influenza.¹

Being a systemic cell damaging (cytopathic) illness, viral Influenza can yield to methodical, sequential cellular supportive, osteopathic treatment. Manual efforts to optimize and deliver elements of the immune system, while maximizing arterial and neural trophic influences to, and venous and lymphatic drainage away from all tissue, are powerful traditional osteopathic interventions. Add to this the hydrodynamic, biochemical and bioelectric influences released and harnessed from the Primary Respiratory Mechanism (PRM), by including strategic Osteopathy in the Cranial Field (OCF) approaches to enhance venous and Glymphatic cranial drainage, and address key neuroimmunoendocrine dysfunctions, and a formidable clinical armamentarium is available. It is common to have the patient brought from the acute phase of the illness to the recovery phase within hours of commencing the caliber of treatment presented within.

In the face of current events facing medicine regarding the COVID 19 / Chinese Originated Viral Infectious Disease, involving the Sars-CoV-2 virus, the discussion of clinical osteopathy becomes relevant. Even though there is a rapidly evolving learning curve of information, to a significant degree, it is clinically analogous enough to what osteopaths have faced before. Even though the sequences in the Wuhan/ n (novel) Coronavirus genome closely resembles those of both strains of HIV virus (HIV-1, HIV-2), the clinical picture of the illness approximates Influenza, both viral respiratory illnesses, enough to warrant the application of these osteopathic manipulative treatment (OMT) interventions. What is herein considered for influenza (flu), and its complication, pneumonia, can also be considered for all manifestations of COVID-19.

In its early days, a century before Evidenced Based Medicine, osteopathy secured its rightful place in medicine by applying osteopathic principles and methods with extraordinary results. Among impressive early victories were with the 1918-19 Spanish Flu pandemic. In that pandemic, the D.O. mortality rate was 0.25% for influenza (of the 110,122 cases reported in all American states and Canadian provinces; representing metropolitan, suburban and rural areas²), 10% for influenza pneumonia (of the 6258 American and Canadian cases reported³); the M.D. mortality rate was influenza 9.8 – 27%, influenza pneumonia 26-73%. ⁴ It should be noted that a significant number of the deaths by pneumonia occurred with 24 hours after the osteopathic physicians were called, indicating that the cases were too far advanced for comparable results to be expected.⁵ Remarkably, in

comparison to the allopaths, the total osteopathic death rate from both influenza and pneumonia was less than one percent. ⁶

The maneuvers discussed below, which might seem insubstantial to the newcomer, are anything but. This profession was built on their efficacy and the consistent remarkable results thereby obtained. As with the 1918-19 Spanish Flu Pandemic,⁷ they are viable and sure to remain relevant, as fall/winter flu is recurrent, and COVID – 19 is also forecasted to reappear or resurge next winter.

Before beginning the therapeutic discussion it is assumed that all physicians grasp the need for social/physical distancing, hygienic and self/community protective measures to limit community spread, which unfortunately, was lax until the end of the 1918 Spanish Flu Pandemic had taken its toll. Important is hydration, an organic, Paleolithic, healthful nutrition, supplementation, especially Vitamin C, including attention to Vitamin A and D3 serum blood levels (because of soil depletion, nutritional indiscretion, sun deprivation and environmental toxin total body burden), avoidance of vaping any substance via E cigarettes, avoidance of the Natural Killer (NK) cell, large granular lymphocyte/white blood cell disabler, Tetrahydrocannabinol (THC), sleep and hygiene (including non-triclosan/antibacterial) soap use⁸ and restriction of antibiotics/antiviral agents to thwart pathogen resistance, skin and respiratory dysbiosis, for example⁹. Experience shows that one of the most effective means of preventing or positively affecting the morbidity, is when patients, regardless of age, are primarily and periodically treated with traditional osteopathy. Even in the face of real life stresses where non-osteopathic factors are less than ideal, it is a testament to traditional osteopathy how well immunity and prevention of infectious diseases is achieved, regardless of the individual complaints that were addressed on a visit-to-visit basis.

The osteopathic discussion that follows will shed light on how OMT benefits the immune system and supports cardiopulmonary function, so vital in the approach to these infectious processes. Because patients are pharmaceutically conditioned in their health care decision making, it can be helpful to mention in conversation, and post an announcement in the waiting room, encouraging patients at the onset of flu symptoms to seek osteopathic care immediately. In an adult early on, these can include: fever, body aches and chills, fatigue, cough, sore throat with possible headache and gastrointestinal symptoms of nausea, vomiting and diarrhea. In young adults, fever may be the primary symptom of influenza. ¹⁰ In a child, early symptoms are not as pronounced. These can consist of a decreased appetite for food and drinks, urination, sleepiness and/or crying without tears. COVID – 19 shares many symptoms of the common flu, although often more intense and with a longer incubation. People can shed the virus while incubating (98% of the cases develop symptoms from 2 days to 2 weeks of exposure – average 5 days - to the COVID – 19 virus), being contagious a few days before flu symptoms manifest. Also, as in the 1918-19 pandemic, using elevated temperatures can be misleading; it was found that a few cases ran temperatures below normal, as much as three or four degrees.¹¹ Also, be aware that temperatures are relative to ones baseline which may be

considerably lower (suggesting a pituitary – thyroid – adrenal axis insufficiency possibly secondary to a high level sphenobasilar synchondrosis - SBS strain pattern) than the arbitrary 98.6 F, and that since they rise as the day goes on, late afternoon, evening and nighttime temperatures are the optimal time to determine if one is febrile. In the criteria limiting allopathic hospital admissions, lower temperatures, such as 99 or 99.1 F, although significant, are routinely discounted.

The osteopathic effort required in any given case of influenza and its complications (ex: pneumonia, and in COVID – 19, Acute Respiratory Distress Syndrome - ARDS, also) can vary greatly because “Virulence of the infecting strain as well as previous organic condition of the patient are factors often impossible to foretell.”¹² Of course, “A knowledge of the identity of the strain or type, among other advantages, guides the doctor in knowing what to expect as to the course of the disease, and results of the measure he takes.”¹³ That being said, “By adjusting structural abnormalities that retard normal physiologic activity through osteopathic manipulation, by stimulating the circulation of body fluids so that tissues can be properly nourished and wastes carried away, by creating a condition in general with the body favorable to the manufacture of chemicals and antibodies, osteopathic physicians are demonstrating that the influenza virus, regardless of strain can be combated successfully.”¹⁴ Therefore, fundamental to osteopathic philosophy are that, “Osteopathic lesions, through disturbing blood supply, retarding venous and lymphatic drainage, and interrupting nervous impulses create a condition favorable to the propagation of the influenza virus once it has gained entrance to the body.”¹⁵

In general, to avoid patient fatigue or exposure, OMT can be administered 1-3 times daily for 20-30 minutes, in an unhurried, gentle, yet steady and firm manner.¹⁶ In practicable terms the tempo and intensity of OMT depends on the severity of the illness and the vitality of the patient. It is often taught that a barometer of vitality or available energy to harness can be ascertained by evaluating the craniosacral mechanism. However, low amplitude in an adult does not necessarily mean low vitality per se – it might reflect SBS compression, irrespective of the energetic reserve for healing. After release with a full or partial/abbreviated VST (confluence of sinuses, occipital sinus and the internal jugular veins), the underlying vitality will become more discernable and is almost always sufficient. Either way releasing the cranial base will benefit the patient significantly. In general, the less PRM range of motion (ROM) sensed, the more intense the OMT indicated. A practical vantage point to gauge is a diagnostic comparison of Sphenobasilar Synchondrosis (SBS) ROM before and after OMT.

The strategy for effective osteopathic intervention of the flu is largely determined by how soon the osteopath is called to the case (and also determines the prognosis, according to Dr. Still¹⁷), how much time the patient can be attended to during the initial presentation, the possibility of and anticipated follow up time until the next treatment and the predominant symptomatic area(s); cerebral, respiratory, gastrointestinal, musculoskeletal. The chief complications are pneumonia (bronchopneumonia, which typically has an indolent course parallels COVID-19

progression), bronchitis, sinusitis, otitis media (the middle ear is clinically comparable to a paranasal sinus) and encephalitis. Suspect complicating pneumonia when a sudden rise in temperature, or a failure to return to a baseline normal, occurs.¹⁸ Again, like conventional flu, COVID-19 can also present with symptoms indicating involvement of other systems such as gastrointestinal.

Influenza can be fatal; the more at risk are the elderly and very debilitated and in those with chronic pulmonary or cardiac disease, although not always, (e.g. 1918-19 Spanish Influenza Pandemic). Secondary bacterial pathogens may cause serious complications such as pneumococcal, streptococcal or staphylococcal pneumonia. In this regard, the pulse oximeter, in conjunction with a detailed history of present illness, including a detailed chest examination, has proven to be an invaluable device. A reading of 95 and below in a non – chronic obstructive pulmonary disease (COPD) patient seems to correlate with findings of pneumonia, or severe pulmonary pathology, readings of 96 and 97 with bronchitis, 98, 99, 100 with the absence of overt pathology and health. Readout swings can occur from apnea of an acute bronchopulmonary infection.

In light of the frequency in which viral influenza progresses and is complicated by bacterial pneumonia, and the particularly severe potential pulmonary insult with the COVID -19 disease, further discussion with respect to the osteopathic approach to pneumonia is in order.

An overview of pneumonia will be followed by procedural details and commentary in a sequential form for those that prefer a methodical approach. The osteopath can begin with an abbreviated VST, including the occipitomastoid and petrobasilar areas, SBS base and vault OMT and an occipital CV4 (compression of the fourth cerebrospinal fluid ventricle). An Occipito – Atlanteal (O-A) joint release can follow. This can release cervical soft tissue restrictions, free blood supply to the medulla and cord and normalize vagal parasympathetic innervation of the heart and lungs (see Inflammatory Reflex below). OMT to the mid cervical region (C 3-5) can help normalize phrenic nerve function for the diaphragm. Rib raising and intercostal restriction correction can stimulate antibody production, red cells and antitoxins, as well as unrestricting heart and lung activity. Unrestricting ribs 5-6 on the left can reduce pulmonary congestion. Next, the superior ribs raised with the infraclavicular – axillary OMT approach, also described below, can normalize thoracic sympathetic autonomic (vasomotor) activity. Unrestricting T 11-12 can normalize elimination. Freeing the superior four ribs and the clavicles bilaterally can address coughing.¹⁹

It has been stated that the first treatment for pneumonia is the most important, and is best treated vigorously, early on in its course to possibly halt progression into full-blown pneumonia. Treat until the predominant symptoms are controlled, supporting the heart (20% of hospitalized COVID -19 cases have marked cardiac manifestations), releasing the anterior chest and improving circulation to the spleen, liver, kidneys, ribs and lungs. Cardiac support can be accomplished by OMT

of the cervical and upper thoracic soft tissues, especially the left ribs 2-5 (see below).

After the first vigorous approach, treatment should be brief, specific and frequent, exertion on the patient's part kept to a minimum. When the temperature is above 103 F treat every hour. When obtaining a temperature less than 103 F, treat every 2-3 hours. With a failing heart, treat every few hours around the clock. Apply, slow, gentle, rhythmic and accurate OMT, ceasing when the skin becomes moist.²⁰ Again, it is "advisable to give a strong deep treatment if the patient is seen before the attack has gained full headway ..." after that "... give short light treatments."²¹

Avoid excessive chills or heat prostration by allowing the covering and uncovering of the patient as comfort dictates and by recommending that a "warm room freely ventilated"²² be provided. Appropriate during the febrile phase of the illness are various fruits and vegetable juices which promote alkalinity that favorably influence body tissues²³ amidst a non-protein, non-solid diet and preferably devoid of all allopathic antipyretic medications, for reasons discussed elsewhere in the literature.²⁴ Also, beware of possible NSAID aggravation of pulmonary inflammation in COVID - 19, aspirin in triggering Reye's syndrome, acetaminophen causing interferon production suppression and illness prolongation. Copious fluids are recommended.²⁵ Clear soups, broths and oral rehydration with an organic non-high fructose electrolyte fluid (Knudsen's "Recharge®") can be helpful in home management, as well.

Although the course of influenza is ordinarily favorable and self-limiting, supportive measures are vital in patients with cardiovascular disease, chronic metabolic and endocrine disorders, chronic bronchopulmonary disease, or those susceptible to viral respiratory infections in general.²⁶ It has been stated about influenza, "In view of the common finding of destruction of the respiratory epithelium, it is interesting to note that the cough may be mild and nonproductive; dryness of the throat is typical."²⁷ Therefore, what follows is a multifaceted outline involving various dimensions of traditional osteopathy, and possible adjuncts, that may be considered as a comprehensive approach or individualized, accordingly. Manipulating osteopaths with conceptual understanding of, coupled with the ability to sense the PRM, have a decided clinical advantage in this undertaking. Although one must be adaptable, every effort should be made to treat on an OMT table so as to more effectively perform the OMT outlined below.

- 1) Venous Sinus Technique (VST) and Sphenobasilar Sychondrosis (SBS) OMT:
With a diagnostic palpatory listening, with or without passive ROM testing, assess the configuration (strain pattern) and degree of compression of the cranial base, the sphenobasilar sychondrosis (SBS). As discussed above, this might yield impressions of the general vitality, although more often it reveals the degree of releasing to aim for, as well as offer a baseline from which to compare vital PRM functioning before and after the treatment session. Typically, after cranial release, with the VST sequence for instance, or even with OMT below the head, the Cranial

Rhythmic Impulse (CRI) at the cranial base will improve, at least somewhat, which over the next hours and days, will translate into improved physiologic function near and far. Any increase in rate, range and/or ease of motion or amplitude will render improved physiologic functioning, given the body time to do so. Releasing restrictions, especially involving or impacting the PRM, tend to improve vitality. This can be readily accomplished while seated at the head of the supine patient with a fronto-occipital contact, for instant. After determining which way the SBS will move around all axis' of motion with passive ROM testing, the opposite motions are stacked to attain a direct release by engaging all restrictive barriers. Withholding treatment rather than attaining releases never seems to serve the patient. Rather, treat while observing the patient clinically for signs of fatiguing.

Whether a headache is present or not, application of at least an abbreviated Venous Sinus Technique (VST) is essential. If cerebral edema is suspected or present, a complete VST is indicated. Factors that can elevate intracranial pressure (ICP) are an increase in blood, brain or CSF volume, as well as a greater resistance to venous or CSF drainage. (Restrictions do not have to be intracranial: It was shown that ligation of all the major cephalic veins in the neck led to moderate ventricular dilatation and that hydrocephalus is also invariably clinically associated with impairment of venous drainage from extracranial obstructions.²⁸ This further justifies cervical OMT – see below.) A 74-year-old woman undergoing immunotherapy for abdominal small cell cancer, presented for OCF. She had delirium secondary to encephalopathy, presumptively from COVID – 19. Despite 4 mg of dexamethasone taken orally three times a day for days, for increased ICP from cerebral edema, her head pain was unremitting. The relief afforded from complete VSTs given, on separate occasions, was immediate and dramatic; profuse appreciation for the “miracle” of “healing hands” would inevitable follow.

An abbreviated VST, in the least, includes release of the external occipital protuberance for the confluence of venous sinuses, the occipital midline from inion to opisthion for the occipital sinus, a bilateral condylar, or (a possible Tide assisted) right and left unilateral decompressions for the internal jugular vein / bulb (and CNs 9, 10, 11). Slowly graduate forces, titrating to engage and hold at restrictive barriers provides direct release. As mentioned, recent research reveals a key role in the function of both tenth cranial nerves in regulating the inflammatory response during infections (see O-A OMT below). Entrapments are released when the jugular foramina, trauma - vulnerable portals are decompressed, which accompanies occipital condylar decompression OMT. In most cases, upper thoracic and cervical procedures should assist in reducing the severity of head pain.²⁹ The relief from this cranial procedure is usually immediate. If head pain persists, the remainder of the steps³⁰ to complete the VST sequence can follow.

OCF for releasing cranial restrictions is an important consideration in COVID -19 given the involvement of the brain in the virally damaged Blood Brain Barrier (BBB) and pituitary dysfunctions leading to low cortisol levels (see CV4 and IVC

sections below). The function of the hypothalamic - pituitary - adrenal axis is also a vital consideration given the devastating pulmonary implications of a dysfunctional Renin – angiotensin system (see CV4 discussion below).

2) Compression of the Fourth Cerebrospinal Fluid Ventricle (CV4):

An occipital compression of the fourth cerebrospinal fluid (CSF) ventricle (CV4) technique can be administered for “a balanced interchange in all the fluids of the body, biochemically, bioelectrically and hydrodynamically.”³¹ In addition to being able to move through foramina according to standard neurology texts (circulation), the CSF has rhythmically fluctuant mobility (fluctuation) under the direct influence of an inherent, involuntary coiling and uncoiling, motile central nervous system (CNS). The CSF, formed mainly in the choroid plexuses and also to some extent in the pericellular tissues of the CNS, escapes at the arachnoid villi into the venous sinuses, as well as traveling via subarachnoid spaces into perivascular channels throughout the entire body,³² providing an uninterrupted continuum from CSF fluctuation and circulation to the lymphatic system.³³ It has been shown that with increased pressures, CSF breaches the arachnoid membranes to reach the extracellular space of the dura mater and dural membrane channels.³⁴ For this reason, and the effect on secondary thoracic respiration efficiency via the medulla adjacent to the fourth cerebrospinal fluid ventricle, it has been referred to as a cranial lymphatic pump.

One of the numerous effects of the CV4 includes a direct effect on the pituitary gland.³⁵ An influenzal post mortem study suggests that infected pituitary (via lowered Adrenocorticotropic Hormone - ACTH) and/or hypothalamus gland (via lowered Corticotropin Releasing Factor) could result in a decreased cortisol level which in turn could explain the malaise, anorexia, (nausea³⁶), fever, weakness, exhaustion and body aches, similar to adrenal insufficiency and characteristic of the illness.³⁷ Adrenal insufficiency itself, secondary to SBS strain induced hypothalamic-pituitary insufficiency, is extremely prevalent to one degree or another, and can conversely predispose one to viral illness, another possible determinant in COVID -19 mortality. Local cranial osteopathic manipulative treatment (OMT) (not “therapy”!) could mitigate a facilitation adversely affecting the hypothalamus, essentially providing a governor mechanism protecting against extremes in temperature in febrile illness.³⁸

One can better appreciate the CV4 as a potent acute phase measure, capable of utilizing Dr. Still’s “highest known element” (CSF), when it is understood that “The intense vascularity of the total surfaces of the choroids plexuses (approximately one square meter) can be seen as a place where dialysis takes place between blood and CSF. Chemical exchanges can thus take place as a result of the compression and opening out of the choroids in conjunction with the primary respiratory movement described by Sutherland. The consequent deepening of the occipital convexity causes the amplitude to diminish and the *speed* to increase in the form of short sharp respirations as it were. This action forces blood/CSF chemical exchange to quicken.”³⁹ This can prove indispensable in a systemic infectious

illness. This effect on the choroidal aspect of the Blood - Brain Barrier (BBB), the Blood - CSF Barrier (the Blood - Extracellular Fluid - ECF Barrier of the CNS capillary beds is the other aspect of the BBB⁴⁰), can prove essential to neurologically symptomatic COVID - 19 patients, as the BBB appears to suffer damage from excess cytokines (see the IVC section). Remarkably, "The surface of the brain capillary bed is about the size of a tennis court. This huge area accounts for the brain's consumption of 20% of basal oxygen intake by the lungs."⁴¹ To this end, all and every cranial, and cranially influencing OMT the patient receives can help restore Glymphatic and venous drainage, relieving backpressure, allowing optimal functioning of the Blood - ECF Barrier.

The COVID -19 infection appears more severe in patients with hypertension, cardiovascular disease and diabetes due to the Sars - CoV - 2 virus attenuating the Angiotensin Converting Enzyme 2 (ACE 2) receptor, skewing the ACE/ACE2 balance, which produces significantly higher levels of ACE. The increased levels cause pulmonary vasoconstriction, and inflammatory and oxidative organ damage, ultimately progressing towards Acute Respiratory Distress Syndrome (ARDS).⁴² The discussion of OCF and COVID - 19 is also a salient one because one of the homeostatic mechanisms (all three are cranially located, the other two being the medulla and reticular activating system⁴³) are directly involved in the Renin - angiotensin system; the hypothalamic - pituitary - adrenal axis. Corticotropin releasing hormone acts on the pituitary to release ACTH, which acts on the adrenal glands for aldosterone signaling of the kidney. This results in a decrease in renal sodium and water excretion and an increase in renal potassium excretion (decreasing plasma potassium), renin converted to angiotensin 1, then ACE in the lungs, and hence vasoconstriction of blood vessels. The net effect is an increase in effective circulating and extracellular volume and blood pressure. Therefore, any measure of release for the cranial mechanism afforded with the VST, CV4, or any OMT technique that leads to an increase in the motion of the cranial base (SBS), stands to benefit the COVID -19 infected patient through improving the functioning of multiple neuroendocrine/ neurologic mechanisms. The various parts of this article addressing the application of OMT for support and improvement of cardiopulmonary and adrenal function are also critical considerations.

Other CV4 effects pertinent to the discussion of influenza treatment are the immune enhancing benefit gained from splenic, liver and pancreatic stimulation.⁴⁴ The CV4 is preferably applied to the occiput to directly and maximally influence the medulla, where all the involuntary physiologic centers in the body, for respiratory rate, heart rate, blood pressure, are located in the floor of the fourth CSF ventricle.⁴⁵ The CV4's effects on the autonomic (vasomotor) centers at the medulla help equalize the vascular system including the lymphatics and sweat glands.⁴⁶ An occipital CV4 is also an effective way to release tentorial flexion or extension strain patterns, directly or indirectly, respectively, including compressed occipitomastoid (OM) sutures. Tentorial motion is important since this cranial diaphragm is influential in thoracic diaphragmatic motion, as well.⁴⁷

OM releases influence bilateral vagal nerve function by decompressing the jugular foramina through which they traverse (see below). In fact, the procedure could mitigate increased tone in other parasympathetic nerves, such as the trigeminal, facial and glossopharyngeal, the dysfunction of which could cause copious secretions of the nasal, lacrimal, and submandibular glands.⁴⁸ As in the head and neck, it has a beneficial effect on lumbar pain, common in the picture of flu, since in areas typically more restricted, the virus will be felt as more painful. Upper and lower extremity releases, with subsequent improvement in limb circulation and pain relief for the flu, with⁴⁹ or without pneumonia, can follow the CV4, as well. CV4's capacity to serve as an antihistaminic agent⁵⁰ should be considered in COVID - 19 patients at risk of, or in septic shock (see below), also.

This author has consistently observed a net increase in arterial oxygen pressure (PaO₂), following a transient decrease during the procedure, extension being consistent with primary exhalation which drives secondary thoracic respiration, as evidenced by pulse oximeter readings before, during and after the CV4 technique. A discussion of the important immunological function and management of fever in the context of osteopathic treatment has been discussed elsewhere.⁵¹ A series of CV4's is also possible. It is noteworthy that the excellent osteopathic outcomes in the 1918-19-flu pandemic did not as yet even include (the VST and) this very immediate and systematically effective application of Dr. Sutherland's cranial concept, which was introduced and made available to the profession much later.

For this discussion, the contraindication for the cranially applied CV4 (as opposed to sacrally applied), would be cerebral edema, as the transient increases in CSF pressure during the procedure could theoretically result in a brainstem herniation if it is positionally obstructing the foramen magnum CSF outlet (other contraindications for a cranial applied CV4 would be acute/recent skull fracture or cerebral hemorrhage). Suspect cerebral edema, in the presence of acute cognitive changes such as confusion, severe head pain, nausea and vomiting. This is possible from a flu or COVID - 19 encephalopathy. In this instance, consider a complete VST for the patient. Also, recall that the occiput is in four parts at birth. Since these elements can potentially entrap cranial nerves and cerebral cortex during the procedure, it is advised to reserve the cranially applied CV4 until patients are older than 9 years off age. The pediatric equivalent of this would be an Incitative Lateral Fluctuation, via the temporals.⁵² The VST will also serve the pediatric population, as well, since direct action is used which brings bone away from the CNS.

3) Occipito - Atlanteal (O - A) OMT:

Since virally invaded soft tissue is damaged and hence toxic, and extraordinarily tender, an occipito-atlanteal (O-A) joint release might follow the CV4. Again, chronically strained areas will be sorer, achier or have some sensation of increased pain, compared to other relatively unrestricted areas. By this time the CV4 has already begun to promote systemic lymphatic as well as local occipital

releases priming the craniocervical junction for release. Discussion of the importance of the O-A region and various techniques appropriate to the age of the patient, including preliminary cervical soft tissues maneuvers, can be found in the literature.^{53 54}

It has since been discovered that normal vagal nerve activity, which, as discussed, rely greatly on the O-A elements, as well as both condylar parts (see Venous Sinus Technique - VST above) being free from restriction and malposition. The vagal cranial nerves (CN) innervate the body's major organs, the heart, spleen, liver and kidneys, where most cells of the immune system are found), and have recently been found to be vital to the immune system via an acetylcholine-macrophage mechanism that regulates inflammation (the Inflammatory Reflex).⁵⁵ This newly recognized role of both unhindered vagal nerves, regulates the immune response to inflammation, in addition to regulating metabolic homeostasis by controlling heart rate, gastrointestinal motility and secretion, hepatic glucose production and other visceral functions, fundamental to an osteopathic approach to the prevention and treatment of all (viral) illness. This can explain, at least in part, the excessive inflammatory reaction from the COVID - 19 pneumonia that makes the infection so lethal. CN 10 entrapments, especially vagal entrapment from a right condylar compression, are almost routinely found to some degree in all patients. This could also help explain the emergence of a COVID-19 triggered post viral syndrome called Pediatric Multisystem Inflammatory Syndrome (PMIS). Again, osteopathic lesioning of the condylar part / O-A structures, mechanically compromising multi-organ influential vagal functioning, can be the underlying causative factor in operation here, as well.

The O – A can be simply released by manually supporting one middle fingertip against the supine posterior tubercle of cervical (C) vertebra 1. Restriction with (or without) anterior or posterior displacement will be accomplished directly or indirectly, respectively, with this approach. The O – A in the young child can be released by taking the entire head and manually translating it on the atlas, anteriorly and posteriorly, so as to identify and held at, engaging the restrictive barrier, for direct release.

It is interesting that the body creates inflammation to increase blood flow to combat disease. Since correcting structure can significantly enhance the natural immunity of the body, OMT essentially has the same effect. Restrictions translate into decreased nerve trophism, cell nourishment, local resistance, and hence lowered immunity.⁵⁶ “The most effective answer is a better circulation; better nutrition; lymphatic freedom to transport products of the bone marrow (blood flowing through picks up fully formed platelets, RBCs and WBCs); normal function of the spleen; liver, pancreas, thyroid, adrenals, etc., and normal relations of all muscular, glandular, scapular, axillary, sternal, mediastinal, clavicular, laryngeal and hyoid mechanisms.”⁵⁷ To this end, emphasis is placed on the O – A junction, clavicles, T spine, ribs and spleen⁵⁸ (see below). In everyday life, infectious agents

are everywhere and unavoidable. One can attain good resistance from the enhanced immunity traditional osteopathy can render. ⁵⁹

4) Cervical (C – spine) OMT:

Accompanying the O-A release, cervical myofascial OMT for the areas of maximal muscular tenderness and pain in someone with the flu are typically the most chronically restricted areas, the cervical paraspinal tissues being the most commonly restricted tissue. Anteriorly, a grasping or approximating direct or indirect soft tissue approach following fine focal finger pad motion testing for myofascial strains in and around the sternocleidomastoid, hyoid, etc. is quite effective.⁶⁰ This would include middle respiratory tract illness such as pharyngitis, laryngitis and tracheitis. Cervical OMT ensures free drainage from the head and throat. ⁶¹

With the operator standing on the contralateral side of the supine patient, releasing of posterior suboccipital tissue is served by reaching across the patient's neck, followed by a posterior to anterior perpendicular pull against the restrictive barrier of the splenius and cervicus capitis muscles and fascia with one hand, while the other contacts both great wings of the sphenoid to stabilize or rotate the head in the opposite direction for a direct release (see fig. 1). Next, the C – spine can be contacted at the segments superior and inferior to a restriction with the first and second fingers of each hand, respectively, for indirect release.

Alternately, the Still Exaggeration technique can be applied by similarly grasping a restricted segment and then with the other hand, positioning the head, first at the point of balance, indirectly, then against and through the restrictive barrier(s), directly (high amplitude low velocity – HALV OMT). Release of the upper C spine, the Atlanteal - Axial (AA) and C 2 related tissues also assists in normalizing vagal parasympathetic function. ⁶² Release of the middle C spine (C 3-C5) helps normalize the phrenic motor innervation of the diaphragm. ⁶³ This, along with thoracic rib and vertebral tissue OMT to release the intercostal nerves and vessels, with rib raising (see below) to decompress subclavian vessels, is indicated in pleurisy.⁶⁴

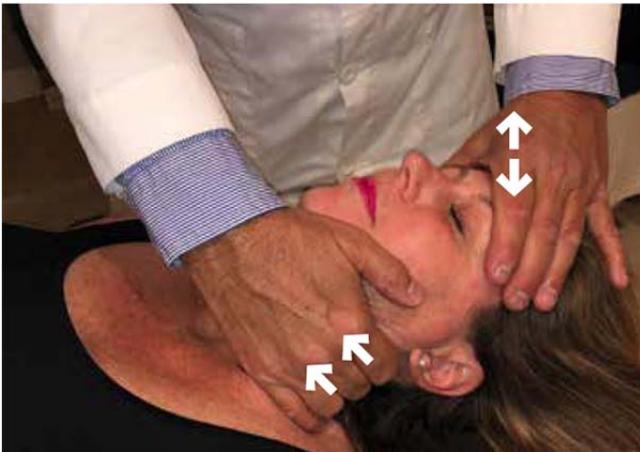


Fig. 1

5) Thoracic Inlet OMT:

When it is understood how influential the next functional junction, the thoracic inlet, is for immunity, given the mass of arteries, veins, lymphatics and nerves traversing it, the release of restrictions affecting its patency and mobility will be appreciated. All head and neck lymphatic drainage empties into the veins posterior to the clavicles. From seated at the head of the table the operator can simply position the hands onto the clavicles for an indirect or direct release, of one or both, if needed, as well.⁶⁵ This is done by grasping each clavicle in each hand, or unilaterally with contacts on the sternocleidomastoid (SC) and acromioclavicular (AC) end. Another approach for the thoracic inlet, akin the rib raising (see below), states that: "For lymphatic drainage by moving the clavicles and ribs sit at the patient's head and place four fingers in the axilla on each side with the thumbs below the clavicles where the lymphatics empty into the veins. Lift the fingers in the axilla and push down with the thumbs to elevate the clavicles and ribs at their sternal ends."⁶⁶ (See fig. 2).

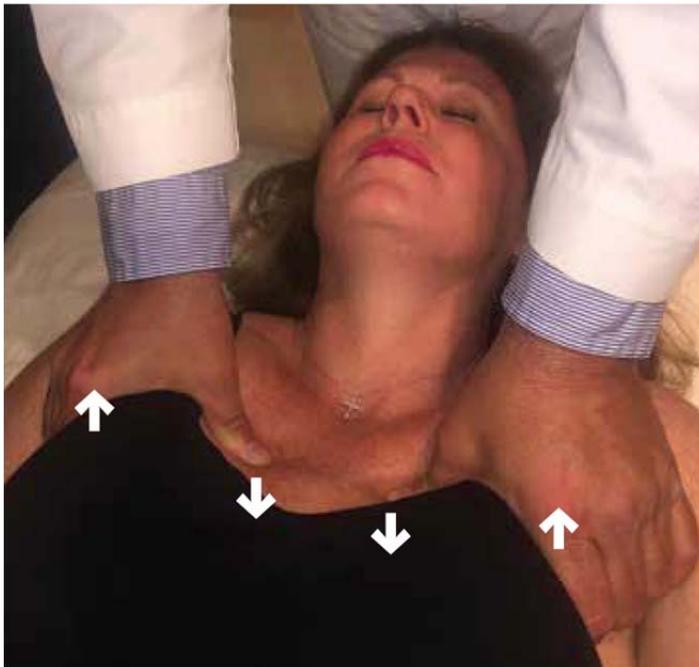


Fig. 2

6) Pectoral Myofascial OMT:

Moving caudad, pectoral traction can be beneficial. This technique could also technically be under the subsequent heading, but the maneuver will be discussed under its own heading to facilitate recall of a simplified way to encourage lymph movement. Because of fascial continuity, it not only influences the chest and its contents but also to proximate tissues of the neck, upper extremities and

abdomen. It is used as a lymphatic pump by increasing inhalation excursion of the upper seven ribs, thereby increasing inhalation negative pressure as well as chest volume (it is estimated that 1 cm increase in chest diameter increases air intake by 200-400cc.⁶⁷). In addition, it can help prepare the chest for compressive sensations commonly induced by the thoracic pumping techniques (below).⁶⁸

While standing at the head of the table, after gently grasping both supine pectoralis muscles and fascia at the anterior axillary line in each hand, leaning back, the operator applies an anterior – cephalad traction to engage restrictive barriers for direct release. This can also be assisted by taking up slack during each thoracic inhalation the patient takes, or is asked to augment, by requesting that the patient “take a deep breathe, in and out”, for 4 or 5 cycles, while maintaining the tractive, restrictive barrier - engaging force during exhalation.⁶⁹ This could exert an influence on patency at the junctions of both lymphatic ducts and left, even right, subclavian veins, because of the pressures that are applied by the thumbs at infraclavicular contacts during the technique.

7) Thoracic Lymphatic Pump:

Thoracic pump techniques, similar to, and often inclusive of pectoral traction, influence the intrathoracic pressure gradients by augmenting the thoracic range of motion and also increasing expiratory efficiency. These techniques are therefore effectual for unrestricting the thoracic duct region and are particularly effective for patients with underlying COPD ⁷⁰, as well as chronic or acute secondary upper, middle or lower respiratory tract infections. (Influenza in someone with COPD, along with underlying cardiac disease, especially in the case of the elderly and very debilitated, can be potentially fatal.⁷¹) In disease such as pneumonia, “bacterial toxins are filtered out by the lymphatic nodes ... this results in autovaccination ... and the production of antibodies.” The earlier this occurs the better ... “ ⁷² Preliminary studies, dating back 100 years,⁷³ and a long history of clinical efficacy suggest that lymphatic pump techniques enhance immune function. One study using pneumococcal polysaccharide antigens designed to primarily detect IgM antibodies, suggested that the lymphatic pump has an effect on the humoral or B – cell component of the immune response. ⁷⁴

In addition, the thoracic lymphatic pump is an effective drainage technique of moving body fluids, both pulmonary and systemic venous return to the heart,⁷⁵ (recall Starling’s Law, which states that the greater amount of blood or preload into the heart during diastole, the greater the amount of blood ejected from it in systole), thereby countering stagnation and congestion, causative though correctable factors of disease. “The vascular results of this procedure are improved lymphatic drainage, not only from the thorax and abdomen but also the head and neck and possibly the extremities.” ⁷⁶ This technique also provides benefits to the chest viscera, vessels and nerves via the anterior chest, specifically the releasing of restrictions of the costochondral joints, at the junction of ribs and sternum. The many patients presenting with costochondritis (the primary cause of chest pain), attest to the incidence of costochondral restrictions. The thoracic

pump technique also serves as an air pump capable of assisting the expulsion of bronchial secretions.⁷⁷ For this discussion it is helpful in clearing the chest and the accompanying cough. Given its scope of influence involving pulmonary drainage and the thoracic duct, some might consider this the key technique to perform, in conjunction with the O-A release for vagal function, if only a couple of minutes are available for OMT during the initial patient encounter, or follow up.⁷⁸

With the operator at the head of the table and patient supine, contact is made with both hands on the patient's chest, inferior to the clavicles and well lateral to the sternum, fingers allowed into the axillae,⁷⁹ however, fingers directed inward or outward, being acceptable (see fig. 3).⁸⁰ The operator generates "a rhythmic but gentle make-and-break pressure about 50 times a minute for five to fifteen minutes."⁸¹ In pediatric applications the rate of compressing is commensurate with the size of the child: forty per minute at two years, thirty at four years, twenty at adolescence. Avoid pressure on adolescent and adult female breasts, perhaps considering compression over the patient's hands. "Infants under the age of two have been successfully treated by this technique adapted to the child's size. The relief afforded by the resultant drainage may be especially dramatic in these cases."⁸²

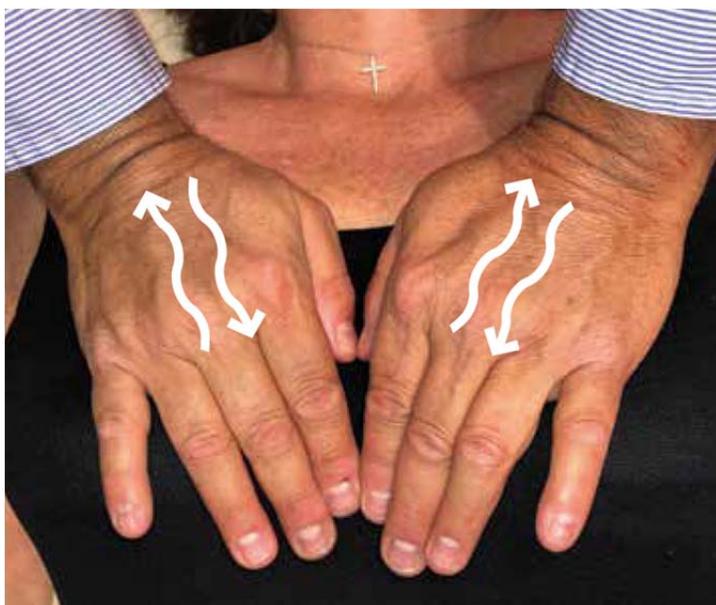


Fig. 3

Another approach amplifies negative air pressures. Bilateral compressions are applied with the patient forcibly exhaling, and even after initially forcibly inhaling, at which point the compression is quickly released. An alternate is to apply this to one side of the anterior thorax at a time, while holding the ipsilateral arm in abduction and extension, even applying traction when the thoracic hand is withdrawn. An alternate bilateral approach is chest compressing with exhalations, and after the continued compressions, upon inhalation, the application of traction

via the arms through the pectoralis myofascia, which in turn augments thoracic excursions.

For elderly patients, traction upon the pectoralis myofascia alone could suffice. This modification could also lessen forces that could otherwise risk emphysema in patients with COPD.⁸³ In any event, the osteopath should be cognizant of the risk of inducing sternal depression or costochondral trauma from excessive force.⁸⁴ When OMT is applied with a vibratory motion, without or with percussor application (see “Percussion” below), viscous secretions may become dislodged, an effect especially beneficial in bronchial asthma. It is also helpful to overcome increased airway resistance in asthmatic disorders by overcoming the associated bronchospasm.⁸⁵

There is a caveat in that, “care must be used in serious illnesses such as pneumonia because this pumping action surcharges the blood stream with toxins and a reaction may occur such as weakness or exhaustion.”⁸⁶ However, the need to mitigate the illness may outweigh the cleansing reactive process. Repetition is necessary and may involve the instruction of a caretaker to do it at intervals through the day or night.⁸⁷ Another cautionary note is that, although the maneuver is applied chiefly for respiratory infections, it has been recommended for general venous stasis, so before it is performed, it is advised “careful determinations be made regarding the heart’s capacity for handling the increase in pre load.”⁸⁸ This writer recalls an older pharmacist patient who presented with cyanotic lips on maximal medications for cardiovascular disease. After relief with this he asked if his wife could learn to administer the technique at home. He was afforded many more years of life, which was credited in large part to her being able to offer this. He would position his back up against the inside of a doorframe serving as a firm counter support to allow the pumping action.

8) Thoracic Spine (T – spine), Rib and Thoracic Diaphragm OMT:

Attention to the thoracic spinal region is also vital. Release of the scapulothoracic myofascial tissue is helpful in any pulmonary illness,⁸⁹ and in general, due to the increase in ventilation for gas exchange it affords. It can be accomplished by slipping the four fingers of each hand, palms up, and fingertips curled around or against the medial border of the scapula while seated alongside the supine patient. This is usually accomplished with the operator leaning back and thereby disengaging laterally with a traction motion followed by engaging all restrictive barriers for direct release. It is helpful to have the ipsilateral upper extremity extended and abducted to more readily gain access around the medial scapular border.⁹⁰ It can be repeated for the other side, as well.

Although various specific spinal and rib lesions are highlighted by traditional osteopathic clinicians, for influenza treatment, such as the “region ... of the fourth thoracic” spine “... following around to the third, fourth and fifth ribs”, it has been wisely stated that “lesions anywhere from occiput to coccyx” can be present, depending on “the symptom-group predominating.”⁹¹ Therefore, it behooves the

osteopath to run two fingers down the length of the prone or supine spine contacting either side of the spinous processes, over the entire bilateral transverse process region to determine if and where the palpating second and third finger pads seem to meet resistance or catch. At this point in the spinal scanning, a deeper examination of the area with focal or regional passive ROM testing for restriction and position can preempt OMT. The same can be done in between the intercostal spaces and over ribs themselves. A clever approach for the direct, HALV release of thoracic lesions in young children with pneumonia is to recruit the forces of the wriggling child active ROMs while manually stabilizing the thoracic vertebra.⁹²

At this juncture it is wise to remember that, “The thoracic cage must never be examined separately from the thoracic spine because, of course, any limitation of the thoracic spine is bound to cause corresponding limitation of movement in the ribs.”⁹³ Further, the operator, standing, can place one hand over the other and gently spring the prone spinous processes, and with the operator seated ipsilateral to the patient supine, contact the paraspinal soft tissue with the fingertips and pads for perpendicular lateral direct action releasing.⁹⁴ A prone technique called raising the diaphragm, is based on the observation described that there is “usually a segmental break between T 8-9 with the transverse processes and ribs posterior to those above. With the right hand pull forward on the right transverse processes of T 9-10 and with the other hand pull back on the left transverse processes of T 7-6.” At this point, engage the restrictive barrier until release and rotation is noted (see fig. 4).⁹⁵

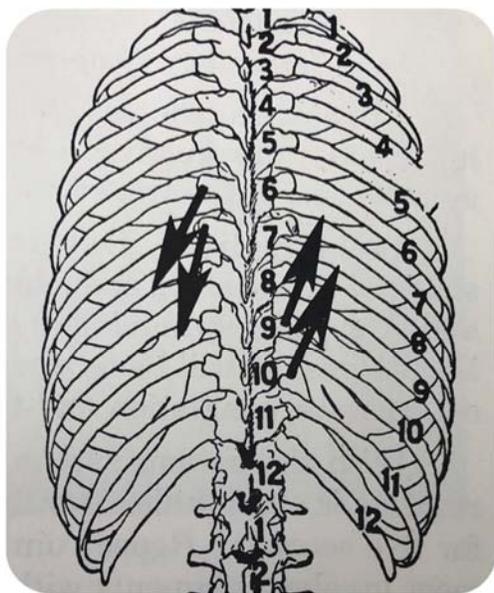


Fig 4

Source: Magoun, Sr., DO (ed.) Harold I.: *Practical Osteopathic Procedures*, The Journal Printing Co., Kirksville, Mo., 1978, p. 72.

From this vantage point, rib raising (see below) and additional thoracic soft tissue releasing, serves to support, normalize and enhance neural function, pulmonary ventilation, arterial flow to and venous and lymphatic drainage away from, inflamed, edematous tissue and assists in the formation of antibodies,⁹⁶ important elements in many diseases, and for this discussion, uncomplicated influenza and its chief, worrisome complication, pneumonia, or severe pulmonary pathology as in COVID – 19. Recall, respiratory sympathetic innervation emanates from, and is adjacent to vertebrae T2 – T7⁹⁷, the approach to the vagal parasympathetic innervation of these tissues having been addressed above. Commensurate with this is the releasing of any rib strain patterns, as well. About this Dr. Still stated, “I have successfully treated many cases of pneumonia, both lobar and pleurotic, by convectoring the ribs at their articulations ... I carefully adjust the misplaced ribs ... “ Be cognizant of the fact that cough not only can be the result of rib restrictions, but can also cause them. Thoracic lymphatic flow is aided by thoracic respiration but impeded by rib and thoracic soft tissue restrictions. Restrictions can cause enlargement of the bronchial and lung parenchymal lymph nodes, which in turn can compress vagal, phrenic and or inferior laryngeal nerves, which can cause coughing.⁹⁸ The upper cervical region, specifically C1 and 2, and the upper thoracic, T1 to 6 are especially troublesome.

For cardiac involvement, have the patient lie on the right side, leaning a little forward, left forearm anteriorly. Operator stands at the patient’s head and with the thumbs perform soft tissue releases to the restrictions in the myofascia of the region of the left side at the base of the neck and around the suprascapular notch. Apply OMT to T 1 to 6 from this vantage point, as well. Emphasis has been placed on these measures to support impaired cardiac function from influenza, as well as many other cardiac conditions.⁹⁹ Attention to releasing the lower T spine aids the lower lung lobes and adrenals, especially important in pneumonia.¹⁰⁰

Three manipulating osteopaths from the mid USA and both coasts independently observed the best results obtained during the 1918 – 19 Pandemic “in treating patients specifically in that part of the spine to which the lowest ribs are attached.”¹⁰¹ Recall the largest of the lymphatic tissue, the spleen (see below), abuts the lower ribs (9-11), the diaphragm, stomach and left kidney.¹⁰² Another benefit of osteopathic attention to this region stems from the fact that the lymph collecting dilated sac at the beginning of the thoracic duct, the cisterna chyli lies anterior to the first two lumbar vertebrae.

Lymphatic circulation is maintained by muscle contraction, and positive and negative pressure of respiration in the thorax and abdomen.¹⁰³ The body increases respiration and pulse rate in disease so as to increase the pumping effect via the positive and negative pressures.¹⁰⁴ During thoracic diaphragmatic inhalation intrabdominal pressure increases apply pressure to vessels and lymph for return cephalad, and during exhalation, negative pressures draw fluid into abdominal vessels. Increases in respiratory excursion, or capacity, increases functional efficiency of the system.¹⁰⁵

The thoracic diaphragm per se, can be diagnosed and treated with the operator standing alongside the supine patient, contacting the anterior costal margin areas bilaterally (or even unilaterally), simultaneously, applying passive ROM testing for each hemidiaphragm by compressing to ascertain the presence or degree of restriction, followed by indirect release of the entire diaphragm and its rib attachments. Very effective is an approach whereby the seated patient slumps forward, while the patient's back is adjacent anterior to the operator, fingertips of both hands reaching around front to grasp around, under or at the anterior inferior costal margins. The patient's trunk is sidebent and rotated for direct release. As a side note, this is excellent for addressing, gastroesophageal reflux disease (GERD), and its companion, hiatal hernia, as well.

9) Rib Raising:

Traditional osteopathy often makes reference to "Rib Raising", for respiratory tract infections, which refers to a general mobilization of ribs.¹⁰⁶ (An overall measurement of chest expansion can be made with a tape measure around the 6th and 7th rib region. For an adult, a 3-inch expansion is average, 4 inches is very good and over 5 inches is exceptional.¹⁰⁷ This can also be estimated with the first two fingers of each palpating hand in a caliper formation, encircling over the lateral rib angles.) This is usually performed after specific rib correction to release any residual remaining restricted rib articular or strained intercostal myofascial tissue to increase respiratory excursion of the thorax. Rib raising becomes especially important in elderly patients or with those with systemic complications because the increase in pulmonary ventilation will help prevent hypostatic pneumonia (pneumonia resulting from infection developing in the dependent portions of the lungs due to decreased ventilation of those areas, with resulting failure to drain bronchial secretions, which occurs primarily in the elderly, or those debilitated by disease who remain recumbent in the same position for long periods¹⁰⁸). The following two approaches can be used for bedside or table OMT. In the first, for the left hemithorax, the patient lies supine, with the doctor standing at level of the patient's shoulder. The operator has the patient reach with the left arm beneath the operator's right axillae and grasps the operator's right shoulder. The doctor then slides fingers of both hands under the patient's chest to contact the proximal rib angles. The ribs are elevated anteriorly when the operator squats (or kneels) and pushes against rib angles with his/her fingertips. This technique exerts considerable leverage on the ribs even if the patient does not contact the hand against the operator's posterior shoulder.

The next approach, a most effective way of increasing respiratory excursion, shares positioning with the thoracic lymphatic pump. The patient lies supine with the operator at the head of the table. If the patient is in bed, he may be shifted until his head is at the edge of the bed. The patient reaches around the operator's body with both arms and clasps his fingers behind the operator. Next, the operator spreads his/her fingers over the patient's chest with thenar eminences contacting just below the clavicles. Pressing posterior/inferior increases expiratory excursion

while leaning backward slightly, the pull through the patient's arms and pectoralis myofascial tissue, to the anterior rib cage, increases expiratory excursion. ¹⁰⁹

10) Splenic Pump/OMT and Liver Pump/OMT:

The importance placed on the spleen by the founder of osteopathy, Dr. Andrew Still, "was borne out by carefully controlled experiments by Prof. Michael A. Lane, in the American School of Osteopathy, when he proved that stimulation of the spleen is vastly important in fighting pneumonia and other infections." ¹¹⁰ The development of this technique was prompted by immunological discoveries, such as: the spleen contains one hundred times the amount of antibody contained in the serum. This culminated in the manipulation of the spleen; a "method by which the spleen could be sharply activated, so as to throw out its enormous store of reserve antibodies" for "arresting infections in all stages of their course, save in such cases as (where) toxins had destroyed too much parenchyma." Experience of this method of OMT led to the excited announcement that, "the results have been so remarkable that the tendency is to believe that there is scarcely an infection, or any other condition of toxemia, that will not readily yield to this method of osteopathic treatment." ¹¹¹

Besides enhancing the filtering of particulate matter before it enters the vascular system, splenic OMT has been found to activate and mobilize both cellular and humeral arms of the immune system; "The white pulp, which is lymphoid tissue, produces thymus-dependent T lymphocytes and B lymphocytes and plasma cells. The latter components produce the humeral antibody component of the immune system, and the T lymphocytes are involved in the cell-mediated arm of the system." ¹¹² This technique propels these immunological elements to the site of active or potential infection. ¹¹³ In short, the splenic pump provides improved splenic circulation, metabolism and antibody formation.¹¹⁴ In addition to the passive stimulation of splenic activity from splenic OMT, thoracic manipulative efforts, as discussed, to increase diaphragm ease and ROM also increase the body's own splenic pumping that normally occurs with thoracic respirations. ¹¹⁵

A curious observation has been made in the intensive care units (ICU) of critically ill COVID - 19 patients: positioning of the patients body in pronation has such a consistent and marked influence on their pulse oximetry (PaO₂), that many are spared mechanical ventilation. The results have made physicians question the wisdom of hasty mechanical ventilation utilization. In addition to known physiologic evidence and clinical trial data for ARDS,¹¹⁶ It could very well be that the positional compression of the breathing chest anteriorly, serve as de facto thoracic and splenic lymphatic pumps, affording critical thoracic drainage and immunity in the face of severe COVID - 19 pulmonary injury.

The actual manipulative procedure is done mindfully without blind force, "especially in infections where the spleen is greatly enlarged, or swollen, and rupture is possible. However no well-trained osteopath will ever rupture the spleen or injure any organ..." ¹¹⁷ Splenic enlargement can be ruled out by

plexor/pleximeter physical diagnostic percussion over the upper left abdominal quadrant with forced inhalation and exhalation. The operator stands alongside the left side of the supine patient and applies the right hand over the anterior, inferior left rib area, while the left hand contacts the posterior left rib area, all fingers pointing caudally (see fig. 5). Alternately, the operator can stand opposite the spleen, reaching across the patient with the right hand posterior, and the left hand contacting anterior to it. Splenic stimulation can be applied by alternate bimanual compression and relaxation of the tissues overlying the spleen anteriorly and posteriorly for 1 ½ to 5 minutes at a rate of twenty per minute.¹¹⁸ This slightly approximates the frequency of the operator's breathing during this effort. OMT of C1-3 benefits the splenic parasympathetic innervation of the spleen, while the sympathetic innervation is normalized by OMT of the left ribs and vertebrae T 8-11.¹¹⁹ Doubtless related to the Governing Vessel (Du) 14 point, percussion of C7 (see "Percussion" below) stimulates the spleen in acute diseases.¹²⁰



Fig. 5

The liver can also similarly be judiciously manipulated for accelerating antibody formation and relieving circulatory stasis as well. ¹²¹ The fascia supporting the celiac, superior and inferior mesenteric sympathetic prevertebral ganglia can be directly or indirectly released, operator's fingertips advancing posteriorly, which can have the net effect normalizing the visceral nerves, to benefit the liver and the spleen.¹²² These are located between the supine xiphoid and umbilicus, dividing this midline area into thirds, superior to inferior, respectively.

11) Pelvic/Lumbosacral, Lower Extremity OMT, and Pedal Lymphatic Pump:

In general, OMT, especially soft tissue for lumbar and lower extremity (LE) pain can also administered.¹²³ Direct or indirect techniques in the context of a comprehensive pelvic OMT sequence, with attention to the PRM, in particular, is preferred, although might not be feasible given time constraints. Hopefully, established patients will have had this comprehensive diagnostic and treatment sequence, already. With patient supine and operator standing at the foot of the bed / table, both heels of the patient are grasped while gently leaning back, thereby applying a caudal traction / distraction to both lower extremities and lumbosacral area. Compression of these structures is more prevalent from gravity-complicated falls, however this maneuver can release LE traction injuries, indirectly, also. After disengagement (or engagement if traction injured), and passive ROM testing to determine restrictive barriers, engage barriers for successive releases through both legs simultaneously, or in tandem until each limb assumes as much of a gross aligned position and tissue/fluid/potency balance as possible, for this attempt.¹²⁴ Or, after traction on the LEs, the operator can take each LE to a point of balance for indirect treatment.

From this vantage point the operator can perform the bilateral pedal lymphatic pump, especially if bedding prohibits or limits OMT from the head of the bed. After grasping the dorsal and ventral aspect of each distal foot, apply passive dorsiflexion alternating with plantarflexion at the same rate and duration as the thoracic lymphatic pump. Always carry a high index of suspicion of deep vein thrombophlebitis, for anyone, especially bedridden, that complains of any symptom in the calf. A discussion of DVT (Deep Vein Thrombophlebitis), in the context of LE OMT, can be found in the literature.

12) Chapman's Reflexes:

Since requisite emphasis is placed on the pelvic mechanism, an ideal segue following this is in addressing Chapman's neurolymphatic reflex points. Consider treating at least the anterior points for the spleen, adrenal glands and upper and lower lungs. Tenderness correlates with severity of organ involvement and diminishes with each treatment of them, albeit often gradually. The upper lung points are at the 3rd intercostal spaces at the sternal borders, and the lower lung points are at the 4th intercostal spaces at the sternal borders. The spleen, considered key for any infection, is located at the 7th left intercostal space at the costal cartilage. The adrenal points are 1" lateral and 2" superior to the umbilicus. Of course, if time allows, the posterior correlates of these points (e.g. spleen: left intertransverse space T 7-8 between the spine and transverse process), and other respiratory points for the upper or middle respiratory tract can be attended to, as well. In a lesser percentage of patients, COVID - 19 can include gastrointestinal symptoms, or can have severe renal involvement; for them the gastrointestinal and kidney points, respectively, can be a consideration, as well. Those that presented only with fever and gastrointestinal symptoms were greatly helped with OMT for the large intestine, small intestine and stomach points. Apply forces in a circular soft tissue manner to release restriction in the fibrous or edematous textured sites, usually releases obtained in a few to 20 seconds, or more. As these

are effective, but also can be quite tender, indicating need for treatment, pursue treatment of these up to the absolute threshold of discomfort. The tremendous efficacy of this OMT approach becomes apparent from experience with Dr. Chapman's impressive contribution.

13) Percussion:

Those in possession of, and verse with a percussion hammer, can release and mobilize a sizable amount of tissue, thereby inducing and allowing the movement of fluids, much to the benefit of the patient, and with no effort on their part. Consider percussing the anterior costochondral joints,¹²⁵ both clavicles, and the sternomanubrial joint. Also, the spinous process of C7 can be percussed, as mentioned, for the spleen. This can be achieved either through the operator's sensing hand or fingers, or directly applied to the body, with a guiding/sensing hand acting as a floating, semi-stable contact on the percussor head, to assist tissue engagement and prevent drift, for direct or indirect OMT accuracy. The motor rate can be slowed to offer anterior thoracic, splenic and/or liver percussion through the operator's hand, in the frequency and duration, discussed above. Stout, more difficult to treat patient's can be seated upright to receive percussion over the midline area of the upper thoracic spinous processes.¹²⁶ In lieu of this motion being supplied by a percussion hammer, a non-oscillatory motion may be manually applied during OMT, as well.

Of the many adjuncts to consider for viral infection, and its complications, a few lesser known, but powerful approaches in and of themselves, deserve at least some discussion. Integrating them into an osteopathic - based approach can be quite effective. If not, the commentary will help to underscore various aspects relative to traditional osteopathy worth noting.

14) Intravenous Vitamin C (IVC):

For thirty years, this author has administered upwards of 50,000 high dose intravenous Vitamin C (IVC) infusions (usually 50,000 mg for adults, 25,000 mg for school-aged children), with and without OMT, in an outpatient setting. The results have been consistently exceptional, if not out right dramatic, and virtually always clinically pivotal, generally within the space of 24 hours, many times during the infusion. This has been observed for all viral infections, most notably for this discussion, influenzal, with and without pulmonary complications. Retrospectively, a number of very ill people this winter, exhibiting all the signs and symptoms of COVID - 19, were able to be treated as outpatients with the help of IVC in this author's active full - time practice, all to great success, and without any apparent long term infectious sequelae. To some degree, others seem to be currently sharing, at least in part, notable results; apparently two local major New York hospitals, amidst the epicenter of the highest rate of infection in the world, have included it in its protocol for COVID -19 hospitalized patients, albeit using low dosages (1,500 mg to 6,000 mgs.). An article by one of these ICU attendings citing the benefits in terms of shortening the length of ICU stays and the duration of mechanical ventilation, with the use of relatively low dose IVC, is available in

the medical literature.¹²⁷ Importantly, it has been found that “In acute virus infection, associated with viremia, ascorbic acid given intravenously will remove the protein protective coat from the virus body, leaving the denuded virus unit vulnerable to the leukocytes for destruction.”¹²⁸ And, given the intravenous (IV) route of administration directly into the blood, the first pass of the liver from oral dosing, which cannot approach IV dosing, is bypassed. The need for bowel tolerance adjusting due to diarrhea, a typical concern for patients, is also averted.

Bioidentical supplementation of cortisol, in the form of hydrocortisone sodium succinate for injection, USP (Solu-Cortef®), can be added to the drip (100mg for adults) for support of the adrenals in debilitated patients. This is prudent considering all cells of the neuroendocrine immune system suffer damage from the virus, especially the pituitary and the adrenal glands.¹²⁹ This is even more important a consideration, given that about only about one in 50 patients in this practice demonstrates adequate 24 hour adrenal sufficiency, vital for immunity, on saliva testing of hormone entering living cells (from four samples throughout the day). The chronic toll of modern day stress upon the adrenal cortex is pervasive and predictable. Add to this the plausible argument that since man (and Guinea pig) do not make or store Vitamin C, a vitamin essential to life, and require larger amounts than the Recommended Daily Requirement (RDA), subclinical scurvy is more common than suspected.

The discussion of Vitamin C becomes all the more relevant for patients in the ICU with cardiovascular collapse, since deaminizing enzymes from damaged cells are inhibited by sufficient amounts of Vitamin C. Destructive activity releases histamine, a major shock-producing substance. Cell damage on the order of what is being seen with COVID – 19 initiates widespread clotting, disseminated intravascular coagulation (DIC), as damaged endothelial cells, leukocytes and platelets all release substances activating blood coagulation, which leads to fibrin deposition in many tissues. In addition, activation of complement in the circulation by endotoxin, specifically the component C5a, appears to increase granulocyte margination and to enhance the extracellular release of granulocytic enzymes leading to diffuse pulmonary injury, or “shock lung”. Subsequently, cells in many tissues are injured by the hypoxia from the resultant hypoperfusion.¹³⁰ Many causes of toxic shock have responded equally as well to high doses of Vitamin C.¹³¹

Not only is the collagen in fascia, the all-important connective tissue addressed with manipulative osteopathy, but all blood vessel walls, are reliant upon Vitamin C, as well. The stronger the cellular junctions of the endothelial vascular layer and ubiquitous fascia, or extracellular matrix (ECM), that transports all nerve, arterial, venous and lymphatic innervation and flow, respectively, the less spreading of the virus and the stronger the host immunity. The life threatening condition of critically ill patients, Acute Respiratory Distress Syndrome (ARDS), characterized by poor oxygenation, seen with COVID -19 is associated with capillary endothelial injury and diffuse alveolar damage. “Increased oxidative stress, an underlying “cytokine storm”, leads to ARDS which is the key pathology of high mortality of

these pandemic viral infections. Cytokine storm-induced ARDS is the key pathology leading to the death of these {COVID -19} patients. Intravenous vitamin C effectively counters oxidative stress.”¹³² The increased cytokines from COVID – 19 are thought to disrupt the Blood - Brain Barrier leading to CNS neurological symptoms, as well. Recall the discussion in the “CV4” section regarding its possible role in neurologically affected COVID – 19 patients. This becomes even more salient when it is realized that the Blood – ECF barrier that resides in the CNS capillary bed differs from other tissues in several ways, relevant to vitamin C, that the endothelial cells require and are bonded by tight junctions to properly function.¹³³ Certainly not limited to the CV4, if contraindicated in cerebral edema, many, if not all OCF interventions can facilitate BBB cytokine drainage. (A discussion regarding the role of the PRM in the newly discovered Glymphatic pathways for brain CSF circulation,¹³⁴ appearing in cranial literature, also underscores the necessity of OCF in patients with a systemic viral infection.) Especially for these reasons, high dose intravenous Vitamin C is recommended for all hospitalized COVID -19 patients, and ought to be seriously considered for outpatients, as well.

The 50,000 mg IVC formula regularly used by this author, calculated for optimal osmolarity, is as follows: Sterile Water 500 ml, (never give sterile water intravenously without the following ingredients – given intravenously alone it is hypotonic and therefore can be lethal), Ascorbic Acid – 100ml (500mg/ml), Zinc Sulfate – 1ml (1mg/ml), Hydroxocobalamin B12 – 1 ml (1000mcg/ml), Calcium Chloride – 0.6 ml (100mg/mL), or – 2 ml Calcium Gluconate (100mg/ml 10%). The standard IV rate is 60 drops/ml via a gravity IV administration tubing, set at the rate of 1 drop / second, with possible titration on subsequent drips up to 2 drops / second, or even slightly faster in some cases. Preservative free solutions are used since any reactions to nutrient drips reported have been preservative related. A pioneer in orthomolecular medicine, Dr. Frederick Klenner wisely stated, “Vitamin C treatment must be intensive to be successful.” And, “Never give less than 350 mg/kg body weight.”¹³⁵ After decades, these guidelines, still valid, are experientially corroborated daily.

A contraindication to large dose IVC is a G6PD Enzyme Deficiency, which renders Red Blood Cells (RBCs) fragile. It can be ruled out by a blood test. In this practice it has been extremely rare: only one patient in 30 years had evidence of it. His might have been to a lesser degree;¹³⁶ besides head pain after an IVC, he was fine. Another contraindication is Sickle Cell Anemia. It has been suggested that megadoses of ascorbic acid might pose a hemolytic risk to persons with sickle cell trait and sickle cell anemia because their RBCs possess more copper than normal and that it might enhance copper induced hemolysis. Further, it is possible that if given in large enough amounts during a sickle cell crisis, it might keep the redox potential of the various problem systems reducing.¹³⁷ Due to their potential for hemolysis, both disorders should be ruled out where indicated.¹³⁸ IVCs efficacy and safety profile for infectious disease, among other clinical applications, beyond the scope of this writing, is superb. This author uses it regularly, often without

OMT due to time restraints, in place of conventional antivirals and antibiotics, to the extent of not being able to recall writing a prescription for either.

There is an incessant concern of physicians concerning nephrolithiasis formation from IVC, which is accepted to be unwarranted. The findings of after tens of thousands of drips administered, (not including the many thousands of other drips such as the Modified Myer's and Calcium - EDTA drips which include substantial amounts of Vitamin C), are identical to the findings of IVC pioneer, Dr. Robert Cathcart, over many years experience with megadose Vitamin C; not a single patient developed stones, confirming an innate protective principle. Dr. Cathcart contended that because of the available megadose of vitamin C, an oxalic synthesis limiting mechanism, at some point, discourages any further conversion of dehydroascorbic acid to oxalic acid by promoting a shift in equilibrium favoring the reducing redox potential.¹³⁹ Vitamin C is a safe, effective "electron donor".¹⁴⁰ This can help explain why healthy, vitamin C – producing mammals are relatively free of stones, in spite of the fact they produce, in humans standards, ultra – megadoses of vitamin C every day.¹⁴¹

15) Nebulized Glutathione:

Since the ciliated epithelium of the respiratory tract seems to be the primary site of infection,¹⁴² and deficient in many due to genetic mutations, the use of nebulized glutathione, a normally endogenously produced intracellular antioxidant, also compatible with OMT, might be considered. This author has also been impressed with this bioidentical substance with patients demonstrating the COVID – 19 clinical picture. This is understandable given the need for respiratory epithelium requiring 140 times the amount of glutathione relative to the remainder of the body. The oxidative damage incurred with normal breathing, which can generate reactive oxygen species (ROS), let alone the increase in production of these oxidants by inflammatory cells. It is one of the most efficient endogenous scavengers of oxidative substances in the airways. (Early on, nebulized glutathione was found to be effective in children with cystic fibrosis, itself a risk factor for death from COVID-19 infections.) This author administers or prescribes 4 ml of glutathione, without preservative, 200mg/ml, per reservoir of a pneumatic nebulizer for alveolar droplet deposition via nebulized inhalation up to four times a day. It is reconstituted with 3 ml of 0.9% NaCl (obtainable in standard 3ml vials for nebulization). When a history of asthma or COPD is present, administer the glutathione following nebulized albuterol or levalbuterol solution to counter any bronchoconstriction from the inhalation of sulfites that come from glutathione solution.¹⁴³ Note that a nebulizer can generate viral aerosols, capable of much farther travel than droplets, therefore all staff should be extra diligent to include the use of an n95 mask as part of the required personal protective devices for being with COVID -19 patients, in general. For this reason, if feasible, home nebulization is preferred. Glutathione can also be given via IV; 100ml of 0.9% NaCl, Normal Saline (NS), with preservative free glutathione 10ml – (200mg/1ml), yields a 2000mg glutathione IV drip.

16) Homeopathy:

A sovereign medical approach in its own rite, Homeopathy has been safely dispensed for influenzal and COVID - 19 with success, even without OMT, in both the acute and chronic phase. Remarkable low mortality rates were also credited with its use in the 1918-19 Spanish Flu Pandemic. How it is compatible with osteopathy and can be used in conjunction with it in a clinical setting has been explored at length.^{144 145 146} After almost 50 years of experience (35 as a licensed physician), this author has determined that influenza, and certainly the dangerous respiratory complications, are in whole or part, due to a tuberculinic miasmatic weakness. In the 1700's, the founder Samuel Hahnemann, MD spoke of the ability of various major diseases to leave a tendency for illnesses in successive generations, albeit in an altered, latent form. The predilection for severe and or recurrent respiratory illness (upper, middle and or lower) is often from familial tuberculosis from the last centuries. The incidence of unusually severe and lethal pulmonary damage for some, even without the usual known risk factors such as diabetes and hypertension, while mild or moderate or not at all for most others, suggests this. The inherited tuberculinic taint could help explain the COVID-19 pulmonary ACE 2 receptor attenuation (see the angiotensin discussion in the CV4 section above). Tuberculinum for respiratory infection prevention has been dispensed frequently over many years, and has proven efficacious. Therefore, remedies such as Bacillinum 30c and 200c, Tuberculinum (Koch) 200c and Tuberculinum Bovinum, in ascending potencies from 200c to CM over five days, have been given out preventively and therapeutically in this pandemic. In addition, decades of consistent, successful prevention with Influenzinum 1M (or 200c) has also proven effective for influenzal prevention to the point of virtually never seeing this illness by this writer, as virtually all have been impressed with its efficacy; they take it religiously during the flu season (September to April).

Dr. Dominic Masiello, DO, has keenly correlated the picture of COVID - 19 with the warm winter, indolently progressing influenzal picture of homeopathic Gelsemium, initially naming it the genus epidemicus remedy (specific treatment for a particular disease) for this disease that all might respond to. For later, deeper pulmonary stages, homeopathic Senega 200c, later considered the genus epidemicus, by him, can also be taken preventively. Homeopathic Antimonium Arsenicosum has been dispensed and recommended for sequential consideration in those primarily with pulmonary manifestations, depending on the response to the prior remedy.¹⁴⁷ This writer also dispenses Gelsemium 30c, and even a nosode called CV (Bovine) 200c from Ainsworth Pharmacy (London, UK) to be taken weekly during the pandemic for prevention, so far with notable success, as well. For treatment of untested, presumed positive or laboratory equivocal or positive cases, consistent results within hours have been obtained with a self-made homeopathic Influenza combination. This consists of Arsenicum A. CM, Arsenicum I. 1m, Bryonia A. CM, Gelsemium 50M and Anas B. 200C (Oscilloccinum®), administered orally, ranging from beginning every 10 - 20 minutes, 30- 60 minutes or hour to two, as needed, with vigorous succussions (as per Hahnemann's 6th and final edition of the Organon) before each successive dosing.

Given the questionable toxicity, efficacy and concerns over vaccination and pathogen resistance to conventional treatment, it behooves one to explore osteopathic considerations for a potentially safe and powerful approach to potentially serious infections such as influenza and COVID – 19.

¹ Still, A.T.: Osteopathy: Research and Practice, The Journal Printing Co., Kirksville, MO, 1910, p. 438,9.

² Clarke, DO, D.L.: Influenza, Osteopathic Magazine, American Osteopathic Association, Oak Park, Ill., Vol. 18, No. 12 Dec. 1931. p. 11.

³ Clarke, p. 11.

⁴ Magoun, Sr., DO (ed.) Harold I.: Practical Osteopathic Procedures, The Journal Printing Co., Kirksville, Mo., 1978, p. 72.

⁵ Clarke, p. 9.

⁶ Mc Connell, DO, Carl Phillip and Teall, DO, Charles Clayton: The Practice of Osteopathy, 4th ed., The Journal Printing Co., 1920, p. 400.

⁷ Mc Connell and Teall, p. 399.

⁸ Graves, Ginny: Supergerms, *Health*, David Watt, Publisher, New York, NY, July/August, 2009, p. 127

⁹ Malcomb, MB, Russell ChB, FFHom: Systems and Symbiosis: The Bowel Nosodes, New York Medical College, Oct. 25, 26, 2008.

¹⁰ Herbert, MD, Fred L., et al.: Diagnostic Pearls For 10 Common Problems, Patient Care, January 15, 1994, p. 90.

¹¹ Mc Connell and Teall, p. 402.

¹² Mc Connell, DO, C.P.: The Treatment of Influenza, editorial, The Journal of the American Osteopathic Association, New York, NY, Oct. 1918, p. 83.

¹³ Rice, DO, Ralph: When Influenza Strikes, Osteopathic Magazine, American Osteopathic Association, Oak Park, Ill, Vol. 28, No. 2, Feb. 1941, p. 6.

¹⁴ Rice, p. 6.

¹⁵ Magoun, p. 72.

¹⁶ Magoun, p. 72.

¹⁷ Still, p. 437.

¹⁸ Rice, p. 6.

¹⁹ Hoag, p. 87.

²⁰ Magoun, p. 86.

²¹ Mc Connell and Teall, p. 402.

²² Mc Connell, The Treatment of Influenza, p. 83.

²³ Hulbert, DO, Ray (ed.): Osteopathic Magazine, The American Osteopathic Association, Publishers, Oak Park, Ill., Feb. 1941, Vol. 28, No. 2, p. 27.

²⁴ Capobianco, DO, Anthony: In the Wake of Treatment (Part 1 of 2), The Cranial Academy, The Cranial Letter, Feb. 2002, Vol. 55, No. 1, pp. 7-11.

²⁵ Magoun, p. 73.

²⁶ Hoag, DO, Marshall M.: Osteopathic Medicine, McGraw-Hill Book Co., New York 1969, p. 722.

-
- ²⁷ Hoag, pp. 722.
- ²⁸ McComb, MD, Gordon: Recent Research into the Nature of Cerebrospinal Fluid Formation and Absorption, *Journal Neurosurgery*, Vol. 59, 1983, p. 376.
- ²⁹ Hoag, p. 723
- ³⁰ Capobianco, DO, Anthony: Dr. Sutherland's Final Lesson: The Venous Sinus Technique, *The Cranial Academy, The Cranial Letter*, Nov. 2003, Vol. 56, No. 4, pp. 8-12.
- ³¹ Magoun, p. 113.
- ³² Brooks, PhD, DP, MSO, MCO, MCrOA, *Lectures on Cranial Osteopathy*, Thorsons Publishers LTD, Wellingborough, UK, 1981, p. 98.
- ³³ Erlinghauser, R.; *The Circulation of the Cerebrospinal Fluid Through the Connective Tissue System*, *Academy of Applied Osteopathy Year Book*, 1959, Pp. 77-87.
- ³⁴ McComb, p. 375, 367.
- ³⁵ Brooks, p. 99.
- ³⁶ Hertoghe, MD, Thierry: *The Hormone Handbook*, SA International Medical Books/Archimedial, 2010, p. 188.
- ³⁷ Jeffries, MD, Charles M.: *Safe Uses of Cortisol*, Charles C. Thomas Publishing LTD., Springfield, Ill., 2004, pp. 137-138.
- ³⁸ Jealous, DO, James S.: *Osteopathy in the Cranial Field* elective lecture, University of New England College of Osteopathic Medicine, Maine, mid-1980's.
- ³⁹ Brooks, p. 99.
- ⁴⁰ FitzGerald, MD, M. J. T.: *Neuroanatomy: Basic and Clinical*, 3 rd ed., W.B. Saunders Co. LTD, London, 1995, p. 49.
- ⁴¹ FitzGerald, p. 49.
- ⁴² Henry, MD, Brandon Michael, Vikse, MD, Jens and Lippi, MD, Guiseppe: *Response of the Emerging Novel Coronavirus*, *BMJ*, 368m406, January 31, 2020.
- ⁴³ Capobianco, DO, Anthony: *Osteopathy in the Cranial Field: A Primer (Part 1)*, *The Cranial Academy, The Cranial Letter*, Vol. 73, Number 2, Second Quarter, 2020.
- ⁴⁴ Brooks, p. 99.
- ⁴⁵ Sutherland, Adah Strand and Wales, DO, Anne L. (ed.s): *Contributions of Thought: Collected Writings of William Garner Sutherland, DO, DSc (Hon.)*, *The Sutherland Cranial teaching Foundation*, 1967, p. 136.
- ⁴⁶ Capobianco, DO, Anthony: *Cranial Osteopathy in Practice: Viral Syndrome, Otitis and Motion Sickness*, *The Cranial Academy, The Cranial Letter*, Vol. 39., No. 4, Fall 1986, p. 3.
- ⁴⁷ Frymann, DO, Viola: *elective Osteopathy in the Cranial Filed* lecture, University of New England College of Osteopathic Medicine, Maine, mid – 1980's.
- ⁴⁸ Channell, DO, MA Millicent King: *The 5 Minute Osteopathic Medicine Consult*, *Wolkers Kluwer/ Lippincott Williams and Wilkins*, Philadelphia, PA., 2009, p. 84.
- ⁴⁹ Magoun, *Practical Osteopathic Procedures*, p. 87.
- ⁵⁰ Capobianco, DO, Anthony: *Cranial Osteopathy in Practice: Chronic Urticaria*, *The Cranial Academy, The Cranial Letter*, Vol. 46, No. 3, Summer, 1993, p. 16, 17.
- ⁵¹ Capobianco, DO, Anthony: *In the Wake of Treatment (Part 1 of 2)*, pp. 8-10.

-
- ⁵² Wales, DO, Anne: elective Osteopathy in the Cranial Field lecture, New England area, late 1980's.
- ⁵³ Capobianco, DO, Anthony: Occipito – Atlanteal Technique (Parts 1 & 2), The Cranial Academy, The Cranial letter, August & November 2004, Vol. 57, No.s 3&4, pp. 12-14 & pp. 4-7
- ⁵⁴ Nicholas, DO, Nicholas S.: Atlas of Osteopathic Techniques, 2ed, Philadelphia College of Osteopathic Medicine, 1974, p. 10.
- ⁵⁵ "Scientists Discover Role of Vagus Nerve," Newsletter: A Publication of the American Academy of Osteopathy, Nov. 2004, p. 8.
- ⁵⁶ Magoun, p. 118.
- ⁵⁷ Magoun, p. 118.
- ⁵⁸ Magoun, p. 119.
- ⁵⁹ Magoun, p. 119.
- ⁶⁰ Capobianco, DO, Anthony: Lessons and Legends: William "Wild Bill" Wyatt, DO, The American Academy of Osteopathy, The AAO Journal, Vol. 15, No. 3, Sept. 2005, pp. 8 – 10.
- ⁶¹ Rice, p. 27.
- ⁶² Channell, DO, Millicent and Mason, DO, David C.: The 5 - Minute Osteopathic Manipulative Medicine Consult, Wolters Kluwer / Lippincott Williams and Wilkens, Philadelphia, 2009, p. 84.
- ⁶³ Channell, p. 84.
- ⁶⁴ Magoun, p. 86.
- ⁶⁵ Jealous, DO, James: Osteopathy in the Cranial Field elective lecture / table session, University of New England College of Osteopathic Medicine, Maine, mid 1980's.
- ⁶⁶ Magoun, p. 73.
- ⁶⁷ Kuchera, ML, Kuchera, WA.: Considerations in Systemic Dysfunction, Greyden Press, Columbus, Ohio, 1994, p. 43.
- ⁶⁸ Ward, Robert C., ed.: Foundations for Osteopathic Medicine, Williams and Wilkins, Baltimore, 1997, pp. 791, 955
- ⁶⁹ Ward, p. 791, 955.
- ⁷⁰ Ward, p. 955.
- ⁷¹ Hoag, p. 722.
- ⁷² Magoun, p. 120.
- ⁷³ Patterson, PhD, Michael M.: A Small Study of a Simple Technique Yields a Great Beginning, editorial of Transient Basophilia Following the Application of Lymphatic Pump Techniques: A Pilot Study, Journal of American Osteopathic Association, Vol. 98, No. 2, Feb. 1998, p. 87.
- ⁷⁴ Measel, PhD, John: The Effect of the Lymphatic Pump on the Immune Response: I. Preliminary studies on the Antibody Response to Pneumococcal Polysaccharide Assayed by Bacterial Agglutination and Passive Hemagglutination, Journal of the American Osteopathic Association, Sept., 1982, pp. 28-31.
- ⁷⁵ Hoag, p. 189.
- ⁷⁶ Hoag, p. 189.
- ⁷⁷ Hoag, p. 189.
- ⁷⁸ Channell, p. 85.

-
- 79 Magoun, P. 119.
- 80 Hoag, p. 750.
- 81 Magoun, p. 119.
- 82 Hoag, p. 750.
- 83 Hoag, p. 189.
- 84 Hoag, p. 189.
- 85 Hoag, p. 189.
- 86 Magoun, p. 119.
- 87 Magoun, p. 119.
- 88 Hoag, p. 189.
- 89 Frymann, DO, Viola: personal communication, mid – 1980's.
- 90 Rice, p. 27.
- 91 Mc Connell, DO Carl (ed.): Clinical Osteopathy, The A.T. Still Research Institute, Chicago, Ill., 1917, p. 490.
- 92 Gutensohn, DO, Max: Lecture for the 100th Anniversary of the First College of Osteopathy, Kirksville College of Osteopathy Medicine, Kirksville, MO, March 28, 1992.
- 93 Stoddard, p. 66.
- 94 Mc Connell and Teall, p. 403.
- 95 Magoun, p. 87.
- 96 Rice, p. 27.
- 97 Channell, p. 84.
- 98 Magoun, p. 120.
- 99 Mc Connell and Teall, p. 403.
- 100 Magoun, p. 87.
- 101 Clarke, p. 9.
- 102 DiGiovanna, DO, Eileen, and Schiowitz, DO, Stanley: An Osteopathic Approach to Diagnosis and Treatment, 3rd ed., Lippincott – Raven Publishers, Philadelphia, 1997, p. 258.
- 103 Magoun, p. 119.
- 104 Magoun, p. 120.
- 105 DiGiovanna, p. 256.
- 106 Litton, DO, Harold E.: Handbook of Osteopathic Technique, 2nd ed., Parker & Company, USA, 1944, p. 125.
- 107 Stoddard, DO, Alan: Manual of Osteopathic Technique, Hutchinson Medical Publications, LTD. , London, 1959, p. 66.
- 108 <https://medical-dictionary.thefreedictionary.com/hypostatic+pneumonia>>hypostatic pneumonia
- 109 Litton, pp.125-127.
- 110 Clarke, p. 9.
- 111 Lane, M.A.: A New Method of Osteopathic Treatment For the Cure of Infections, The Academy of Applied Osteopathy, 1955 Yearbook, Academy of Applied Osteopathy, (Reprinted from the Journal of Osteopathy, Vol. XXVI, No. 12, Dec. 1919), 1955, 171–175.
- 112 DiGiovanna, p. 256, 258.

-
- 113 DiGiovanna, p. 259.
- 114 Magoun, p. 119.
- 115 DiGiovanna, p. 258.
- 116 Henderson, MD, William, Griesdale, MD, Donald and Ronco, MD, Juan: Does prone positioning improve oxygenation and reduce mortality in patients with acute respiratory distress syndrome?, *Canadian Respiratory Journal*, Jul-Aug , Vol. 21, No. 4, 2014, pp. 213-215.
- 117 Lane, pp. 171-175.
- 118 Hoag, p. 751.
- 119 Magoun, p. 98.
- 120 Magoun, p. 98.
- 121 Magoun, p. 110.
- 122 Magoun, p. 112.
- 123 Hoag, p. 723.
- 124 Capobianco, DO, Anthony: Legends and Lessons: William “Wild Bill” Wyatt, *The AAO Journal*, The American Academy of Osteopathy, Sept. 2005, p. 9.
- 125 Mc Connell and Teall, p. 403.
- 126 Mc Connell and Teall, p. 403.
- 127 Stewart, Kim: Is Vitamin C the Unsung COVID – 19 Hero?, *Today’s Practitioner*, www.todayspractioner.com
- 128 Klenner, MD, F.R.: Significance of High Daily Intake of Ascorbic Acid in Preventative Medicine, *Journal of Preventative Medicine*, Spring, 1974, p 3.
- 129 McK. Jeffries, MD, William: Safe Uses of Cortisol, Third ed., Charles C Thomas Publisher, LTD., Springfield, Ill., 2004, pp. 33-64.
- 130 Petersdorf, MD, Robert, et al., *Harrison’s Principles of Internal Medicine*, 10th ed., McGraw-Hill Book Co., New York, 1983, p. 860.
- 131 Klenner, p. 4.
- 132 Cheng, MD, Richard, et al., Early Large Dose Vitamin C in the Treatment of Choice for 2019-nCov Pneumonia, *Orthomolecular News Service*, Feb. 16, 2020.
- 133 FitzGerald, p. 49.
- 134 Capobianco, DO, Anthony: *Osteopathy in the Cranial Field: A Primer*
- 135 Klenner, p. 2.
- 136 Cathcart, MD, Robert: Vitamin C: The Nontoxic, Nonrate-limited, Antioxidant Free Radical Scavenger, *Medical Hypotheses*, Vol. 18, 1985, p. 70.
- 137 Cathcart, Vitamin C... p. 70.
- 138 Cathcart, MD, Robert: Vitamin C in the Treatment of Acquired immune Deficiency Syndrome (AIDS), *Medical Hypotheses*, Vol. 14, 1984, p. 432.
- 139 Queen, H. L.: *Chronic Mercury Toxicity: Volume 1*, Queen and Company Health Communications, Colorado, 1988, p.143, 144.
- 140 Cathcart, MD, Robert F.: personal communication 1990.
- 141 Queen, p. 143.
- 142 Hoag, 722.
- 143 Marrades, Ramon M. et al., Nebulized Glutathione Induces Bronchoconstriction in Patients with Mild Asthma, <https://doi.org/10.1164/ajrccm.156.2.9611001>
PubMed: 9279219

¹⁴⁴ Capobianco, DO, Anthony: Osteopathy and Homeopathy: A Match Made In Heaven (Part 1), The Cranial Academy, The Cranial Letter, Nov 2014, Vol. 67, No. 4, pp. 6 – 15.

¹⁴⁵ Capobianco, DO, Anthony: Osteopathy and Homeopathy: A Match Made In Heaven (Part 2), The Cranial Academy, The Cranial Letter, Feb. 2015, Vol. 68, No. 1, pp. 8 – 10.

¹⁴⁶ Capobianco, DO, Anthony: Osteopathy and Homeopathy (Part 3): A Match Made In Heaven, The Cranial Academy, The Cranial Letter, p. 11 – 19.

¹⁴⁷ Masiello, DO, DhT, Dominic: Corona Newsletter – Part – 2, <https://us&campaign-archive.com/?e=&u=83a276d3df7920247bd700fb&id=ae29a095fa>, March 2020.