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Primary Care Modalities for Osteopathic Manual Practitioners: Thoracolumbar Distress

Optimal structural integration, uninhibited neurological function, the most complete structurally allowable range of motion and musculoskeletal strengthening of the major load bearing joints and the inferior appendicular musculoskeletal segment of the human anatomy, in addition to, strengthening of the anterior and posterior muscular core are primary contributors to augmenting the patients' aptitude for attaining a state of potentially continual alleviation and possible cessation of thoracolumbar pain, symptoms contributing to a lesser quality of life and reduced mobility arising from degenerative conditions of the vertebra and disc disease, herniation and vertebral compression resulting in associated and disassociated joint pain, muscle and connective tissue pain due to inflammation or an acquired compensatory spasmodic muscular condition, in addition to, coincident radicular pain or parasthesia.

Respectively, the optimization of the patients' structural integration will be a co-dependent process upon which pre-existing conditions and pathologies, whether acquired, congenital or idiopathic, will dictate the prognosis as well as the physical presentation of a musculoskeletal deficiency, dysfunction and relative disequilibrium. Anatomical idealism, as a conceptual basis for comparison in differentiating natural human anatomy and physiology from occult manifestations of structure and function, is crucial in determining the most appropriate and viable treatments and testing processes for thoracolumbar pain and presentations of such progressions, as a consequence, precedence or coincidence of a less than uniquely optimal musculoskeletal structure.

Diagnostics and Processes

The primary function of history taking and examination is to preserve the health and safety of the patient. In determining the functional degree of the patients' structure and the most appropriate sequence of mobilizations, muscle energy techniques, stretching and therapeutic exercises, as well as, preventative care consisting of dietary and lifestyle modifications, it is most prudent and appropriate, after having taken a detailed patient history and examined a standing anatomical figure and posturing as well as critical evaluation of the patients' ambulatory abilities, employing standardized orthopedic testing to assess the joints implicated according to the indication of the patients' initial complaint and taking onset and severity into consideration. The location of the manifested pain or discomfort stated in the initial complaint would not preclude any localized deficiency, dysfunction, relative disequilibrium or a less than, uniquely optimal, musculoskeletal structure of the patients major load bearing joints and correlated inferior appendages affecting the treatment selection process and progressive treatment of a chronic manifestation or a compounded chronic manifestation of myopathic, neuropathic and or articular pain and discomfort with associated complications of such etiologies. Results from orthopedic testing provide strong clinical evidentiary support for multiple primary care

modalities for the osteopathic manual practitioner. Given the anatomical complexity, neurologic significance and inferior appendicular correlations with the vertebral column as well as the regulatory systems of equilibrium and coincident weight distribution through the axial skeleton and its consequential effect on the patients' complete physiology, the most appropriately complete system and progression for treating thoracolumbar pain is a multifaceted dynamic in addition to being multidisciplinary in its entirety. As this dynamic applies to osteopathic manual practitioners, the patients' complaint and symptoms require attention beyond direct treatment to the joints providing a positive result in orthopedic testing. The superior appendages, in addition to the skull, effects the thoracolumbar segment of the vertebral column as a coincidence or consequence of a less than uniquely optimal musculoskeletal structure, relative to a gravitational consequence or coincidental injury. Such correlated imbalances in weight distribution, associated injuries or possible idiopathies, generally become most visible in a structural position where the patient can be observed in an upright, bipedal distribution or assuming the position where the forces of gravity will provide the best available representation of the patients' primary physical function or lack thereof. Within the context of primary care modalities for thoracolumbar pain, treating the superior appendages and skull would not be within the scope of the most appropriate treatment based on patient history but rather a component of continued care and of the most uniquely complete process for structural integration which remains a contributing factor to successful alleviation and possible cessation of thoracolumbar pain and associated myopathies, neuropathies and arthritides.

Orthopedic Testing

For orthopedic testing refer to Buckup K. (2008) *Clinical Tests for the Musculoskeletal System: Examinations, Signs, Phenomena*, 2nd edition, p.1-67.

Influencing Forces and Directionality

Gravity is the primary constant force exerted upon the entire human body throughout its lifespan. Sleep position is also required information and should be covered in history taking. A thorough patient history is absolutely required in determining the structural position of majority (seated, static erect, ambulatory, prone, supine, lateral, recumbent) throughout the patients' life and how said positioning has affected their structure as a whole as compared to the anatomical position. How these forces act upon the static structure, as they correlate to the anatomical position, as well as ambulation and primary physical function for daily life, lend credibility to the specificities of a less than uniquely optimal physical structure and lend support for the applications and adaptations of the most appropriate primary treatments. In addition to supporting evidence, a continual system for identifying deficiency or dysfunction, as well as concurrent changes in structure and plausible directionality for future treatment and further modalities for preventative and consequent care can be observable and palpable. This naturalized approach is not meant to preclude positive results from orthopedic testing supported by patient history as a means to approach primary manual osteopathic care modalities and their clinical applications or inferences. Applying directionality of constant force as a theory for preliminary

diagnostics in searching for regional structural weakness and compensations reinforced by habit, rather than an underlying disorder or symptom of disease, can become a reliable tool given accurate history and open communication between the patient and practitioner.

Neurology

Neurological examinations attribute a value or grade to function surround the applicable exam type and purpose. These examinations as strong indicators for dysfunction, however, “diabetes, chronic alcohol abuse, Vitamin B12 deficiency, and other metabolic disturbances can affect many parts of the nervous system” (Gelb D. J. (2011) *Introduction to Clinical Neurology*, 4th edition, Preface xi). In general, a six step neurological exam is sufficient in the screening process for lesions or weakness. It is, however, possible that specific patient complaints may require an adapted examination. Impedance or disconnect in neurological function, as prior diagnosis, contributing to a physical manifestation and presentation of an asymmetry or dysfunction can be treated as a permanent component of the patients’ physiology and all associated complications, compensations, and weaknesses or disabilities should be noted and treated accordingly. In specific cases with a declining neurological prognosis, seen commonly with ALS and progressive MS afflicted patients, treatment for pain and discomfort is most appropriate when architected to modify the disease process where possible to reduce the symptomatic effects of neurological decline.

Examination

For neurological examination refer to Gelb D. J. (2011) *Introduction to Clinical Neurology*, 4th edition, p.43-93.

Core Muscle Involvement and Viscera

Core strengthening, stretching and visceral applications of osteopathic treatment are vital components to long term cessation of generalized “back pain”. All spinal neurons receive input from the viscera and deep musculoskeletal structures as well as the skin. Visceral treatments are applicably relevant in the treatment of thoracolumbar pain given that prior testing or specific history correlates with impingements or tension within the range of the 8th to 12th ribs and 2nd, 3rd and 4th lumbar vertebrae. The associated ribs would generally be the patients’ left side first with possible consequential compensation. The associated lumbar vertebrae would be localized to the immediate right of the patients’ midline and located approximately one inch superior to the umbilicus in an approximate three inch segment, respectively the measure of three vertebrae. The visceral application of osteopathic treatment is involving the jejunum, which at the aforementioned location, passes parallel to the spine and can affect its mobility and cause pain which would present itself as “lower back pain” to the right of the patients’ midline at the level of L2, L3, L4. The most commonly effected joints consequently would be L2-L3 and L3-L4 and the corresponding treatment is applicable to the entire lumbar spine given a joint mobilization is

not contraindicated. Pelvic tilt in addition to tension within the pelvic sling, visceral ligaments or muscle fiber and connective tissue generally contribute to a structural imbalance resulting in Cephalad progressive pain and discomfort when not treated. Palpations and testing for the purposes of identification of zones of less than uniquely optimal function, arrangement of muscle, connective tissue and neurologic webbing is crucial for the development of a treatment plan including therapeutic exercise and stretching.

Therapeutic exercise for core and associated stabilizing muscles is immediately indicated given the patients' physical ability and willingness to perform the recommended activity. Therapeutic exercise is not meant to cause additional pain, swelling or generally aggravate the underlying injury or condition.

Core Exercise

For core exercises refer to Manocchia P. (2008) *Anatomy of Exercise: A Trainer's Inside Guide to Your Workout*, p.154-183.

Stretching

Stretching and assisted stretching paired with muscle energy techniques serve to aid in the optimization of the anatomical structure through directly influencing the capacity for healthy function of agonist and antagonist muscles. The osteopathic manual practitioner will have the ability to isolate, assist and release affected muscles which contributes to higher efficacy of joint mobilizations and allowable range of motion. Combining soft tissue treatment, patient permitting, with the aforementioned myopathic interventions is acceptable and generally preferable within the scope of primary care, excluding the evaluation session. These techniques are to be applied precisely and with care. "Once the resting membrane potential reaches a threshold potential (generally -62 millivolts), the cell becomes excited or active. Activated neurons release other neurotransmitters to activate other nerves, causing activated muscle cells to contract. Facilitation occurs when the resting membrane potential is raised slightly above normal but below the threshold potential" (Nelson A. G., Kokkonen J. (2014) *Stretching Anatomy*, 2nd edition, Introduction vi). Once the membranes' cellular potential is raised, the technique becomes therapeutic. Surpassing threshold potential can cause pain and can negatively influence related joint stability and overall structural integrity.

Results from the neurological examinations and orthopedic testing should provide sufficient evidence for primary care modalities. With appropriate treatment planning it is possible to stretch implicated muscles before mobilizing a joint. Results of the prior examinations and patient history should dictate whether the stretch is most appropriately applied actively or passively. If the stretch is best indicated through muscle energy techniques due to greater instability or associated complications, direct application of muscle energy techniques are acceptable treatments.

Stretching Recommendation

It is beneficial to stretch the patient prior to treating with osteopathic mobilizations and muscle energy techniques, (Dr. Abazar Habibinia MD, CSDTT, DFN).

Manual Medicine

Osteoarticular joint mobilization balances muscle tension and serves to reduce localized edema. It is a methodology of manual medicine with scientific significance. In addition to primary treatment for localized pain and combined with stretching, assisted stretching and osteopathic muscle energy techniques has a positive correlation with improving range of motion in the effected joint. The biochemical significance of therapeutic joint mobilization is the chemical release of endorphins which help alleviate acute pain and is a component of primary care.

Osteopathic muscle energy technique (MET) is a direct manual technique that uses a voluntary contraction of the patients' muscle against a distinctly controlled counterforce from a precise position and in a specific direction. Muscle energy is an active manual technique. MET serves to stretch muscle, strengthen muscle, relaxes muscle and decreases spasm and hypertonicity. It also reduces local edema, decreases myopathic pain as well as helping to prevent injury.

Soft tissue technique (STT) as it applies to the osteopathic manual practitioner serves to manipulate muscle and connective tissue as well as influence circulation to enhance function, aid in recovery and the healing process, decrease muscle reflex activity, inhibit motor neuron excitability and promote relaxation. Soft tissue therapy can be largely beneficial to the anxious patient. Psychosomatic resistance and anxiety make it difficult to be successful with treatment which is also an applicable phenomenon to osteoarticular joint mobilization and muscle energy techniques. In addition to a strong trust based relationship, the manual osteopathic practitioner can gently relax the patient as well as the physical section being treated by lightly rocking or wiggling the area until resistance stops. Using breath assisted mobilizations and even an entire treatment can help a resistant or anxious patient relax and allow for the therapeutic action to more accurately and safely be applied and take effect. "Muscle fiber and connective tissue adhesions can be affected with increased drag to the tissue. Superficial fascia will only be addressed if the skin layer is engaged." (National Academy of Osteopathy (2014) *Massage and Soft Tissue Techniques* [PDF Presentation]. Retrieved from <http://www.manualosteopath.com/attachments/article/227>)

Joint Mobilization

For joint mobilization techniques and guidance refer to Edmond S. L. (2006) *Joint Mobilization/Manipulation: Extremity and Spinal Techniques*, 2nd edition.

Obligatory and Preferred Lumbar Joint Mobilizations

Lateral recumbent osteoarticular lumbar joint mobilizations are obligatory and preferred techniques for lumbar pain unless contraindicated or consent is not given. Rotational techniques are preferred and are best executed when assisted by knee control. These techniques are applicable with contact on the transverse process or the spinous process and are also executed with Cephalad traction where the practitioner can apply a humeral weave position as the opposing point of control from the knee assist, (Dr. Shahin Pourgol MBA, DC, DOMP, DO).

Connective Tissue Plasticity

Connective tissue cells have the capacity to rearrange themselves and their properties in response to the various demands placed on them by individual activities and injury. “Stress going through a material, deforms the material, thereby ‘stretching’ the bonds between the molecules. This creates a small electric flow known as a piezo- (pressure) electric charge, and the connective tissue cells are capable of responding by augmenting, reducing or changing the intercellular elements in the area” (Myers T. W. (2001) *Anatomy Trains*, p.15). The activities and injuries of the individual serve as programming for how tissue can develop or adjust to become unique to support the patients’ structure consequential to the given activity or injury. These structural consequences in tissue formation are developed as a compensatory response to stress. Identifying these tissue formations as a less than optimal developmental response for future cessation of pain and implementing soft tissue therapy and osteopathic manual medicine methodology to treat symptoms of a structural dysfunction are to be considered viable for primary care when correlated with the patients’ complaints.

Roles and Responsibilities of the Osteopathic Manual Practitioner

Osteopathic manual practitioners initially isolate signs and symptoms through detailed medical history which is absolutely necessary for the process of developing a treatment plan for primary care and to ensure the safety and appropriateness of treatment. It is of the utmost importance to, legitimately, earn and maintain a trust based and result driven relationship with the patient as the practitioner–patient relationship is in itself therapeutic. Recognizing that pain and distress is symptomatic of abnormalities or dysfunction in structure, consequential of disease and some medical treatment, the osteopathic manual practitioner is equipped with recognized, scientifically grounded and natural manual medicine methodology.

The osteopathic manual practitioner must be able to refer and report to the appropriate specialist or general practitioner of medicine whenever applicable. The appropriateness of care is the most important. As a manual health care practitioner, the patients’ health and safety and informed consent are prioritized.

Informed Consent

“Consent is often implied either by the words or the behaviour of the patient, for example by volunteering a history, answering questions, or submitting without objection to physical examination. When treatment may cause more than a little pain or carry significant risk, the patient should be asked to express their consent. A note in the patient's record may be adequate to document consent, but in some circumstances it may be wise to obtain written consent.”

(The Canadian Medical Protective Association (2014) *Informed Consent: More Than a Signature*. Retrieved from https://www.cmpa-acpm.ca/cmpapd04/docs/ela/goodpracticesguide/pages/communication/Informed_Consent/why_and_when_do_we_need_consent-e.html)

Associated Complications

Thoracolumbar pain is representative of a more structurally central breakdown of the body's integrity involving large and deep muscles, connective tissue, multiple nerve bodies and roots as well as points of balance in addition to major load bearing joints. Degeneration of such structures correlates with a less free and functional thoracic spine and cage which ultimately bears down on the body's points of balance throughout the spinal column as well as our central neurological chain. Compressions and restrictions to the central chain also correlate to a reduction in blood flow to the superior appendages with the combined potential resulting in reduced muscle strength, pallor, hyperhidrosis and positional numbness, parasthesias or even symptoms of orthostatic hypotension. Treating thoracolumbar pain is therefore a complex and sometimes ambiguous process involving various consequent, coincident and precedent applications of methodology to activate, stretch, mobilize and generally optimize the body's affected and involved systems

Epidemiology and the Socioeconomic Consequences

“The lifetime prevalence of non-specific (common) LBP is estimated at 60-80% in industrialized countries (1-year prevalence 20-60%, adult incidence ~6% per year). The prevalence rate during school age approaches that seen in adults, increasing from childhood to adolescence and peaking between the ages 35 and 55. Symptoms, pathology and radiological appearances are poorly correlated. The majority of episodes of back pain among workers do not require sick leave, and those that do generally are associated with return to work in a timely fashion; however, around a third are likely to have relapses of work absence, and recurrent and chronic back pain is widely acknowledged to account for a substantial proportion of total workers absenteeism. About half the days lost from work are accounted for by the 85% of people who are away from work for short periods (<7 days), whilst the other half is accounted for by the 15% who are off work for >1 month. This is reflected in the social costs of back pain, where some 80% of the healthcare and social costs are for the 10% with chronic pain and disability”

(Adams M. A., Bodguk N., Burton K., Dolan P. (2013) *The Biomechanics of Back Pain*, 3rd edition, p.220). Given the widespread prevalence, implications of absences and term disability can effect worker psychology, family life and threaten future planning in addition to increasingly detrimental consequences arising from augmented stress and potential feelings of inadequacy, guilt or shame. “Likewise it is a mistake to assume that psychosocial factors such as depressive tendencies and work dissatisfaction are important causes of back pain; in fact they explain people’s responses to pain rather than the pain itself. Recent pain provocation studies have not only located the anatomical origins of severe back pain, they have also confirmed that patients’ characteristic back pain is often reproduced when the affected tissue is mechanically stimulated. These considerations have also been acknowledged: The balance of back pain research has perhaps swung too far towards these psychosocial issues, to the neglect of the physical. Hopefully, the pendulum will swing back” (Adams M. A., Bodguk N., Burton K., Dolan P. (2013) *The Biomechanics of Back Pain*, 3rd edition, p.1).

Bone and Joint Support Nutrients

“Supplemental amounts of vitamins and minerals in support of bone health really depend on a person’s diet and other lifestyle factors. However, as a general rule, bone-strengthening supplements should contain a little bit over the DRI (Dietary Reference Intake) level for each nutrient. For calcium, this would mean about 1,200 mg a day; for magnesium, about 400 to 600 mg; for boron, about 3 to 5 mg; and for vitamin D, about 400 IU. Vitamin K supplementation in the case of osteoporosis and other bone problems, because this vitamin is needed to produce the correct form of osteocalcin, among the most plentiful noncollagen proteins found in parts of the bone. As little as 1 mg of K seems to show up as significant in the research on bone health.

Glycosaminoglycans (GACs) are essential for joint health. The doses in these studies involve about 1,500 mg of glucosamine sulfate (or a combination of GACs) per day. 2,000 to 3,000 mg daily is recommended for acute joint inflammation” (Haas E. M., Levin B. (2008) *Staying Healthy with Nutrition: The Complete Guide to Diet and Nutritional Medicine*, 21st Century Edition, p.264).

Contraindications

Contraindications include fractures, excessive pain, localized infections, inflammation, recent skin laceration, sutures, open lesions, blisters and sunburn.

Primary Care Modalities

Understanding the etiology of pain or weakness, strong communication and thorough examination is the basis upon which coherent and effective primary care is deemed applicable, organized and executed. What is safe and logical is best practice. Presentations of thoracolumbar distress can be a combined manifestation of greater structural imbalances in addition to congenital and acquired dysfunction. The application and planning for treatment requires thorough patient history, neurological and orthopedic testing combined with palpative techniques. Sound diagnostic techniques and practical applications of osteoarticular joint mobilizations, muscle energy techniques, soft tissue techniques and informed consent allow for the best physically and psychologically therapeutic environment for augmenting the patients' propensity for responding to pain modulation. The patients' potential for achieving sustainable cessation of pain and discomfort is reinforced through good practices in lifestyle, nutrition and therapeutic exercise. Manual osteopathic primary care includes stretching as an important function for the relief of pain and discomfort and is applicable to primary care once a thorough history has been taken and appropriate tests have been conducted. The osteopathic manual practitioner is an important and valuable addition to personal and family health care.

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