

## ***A Functional Look at Back Pain and Treatment Methods***

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Two primary sources of chronic back pain are muscular hypertonicity (resulting in joint compression and possible nerve impingement) and lactic acid buildup in hypertonic muscles (creating nociceptor irritation). Improper or insufficient movement and/or postural habits lead to (and result from) chronic muscular hypertonicity and soreness.

This essay presents a radical departure from the conventional viewpoint of clinical therapeutics. It states that to resolve back pain often requires neither strengthening nor stretching, neither mechanical skeletal adjustment nor application of electrical stimulation, heat or cold, neither muscle relaxants nor surgery. In many cases, to resolve back pain requires nothing more than improving the link between kinesthetic awareness and motor control, the benefits of which, in some cases, might be *augmented* by soft-tissue manipulation. Both traditional and newer treatment methods are discussed.

### **INTRODUCTION**

The conventional understanding of muscular back pain is that it results from traumatic injury, poor posture, genetic (mis)endowment, old age, or from "insidious causes". Pain is often attributed to strain, sprain, or facet joint damage.

In cases of traumatic injury, such as whiplash or a lifting injury, a strain, sprain, or joint damage may in fact have occurred. In many cases, however, pain reflects chronic muscular hypertonicity following injury or subsequent to long-term stress.

Lactic acid buildup and tissue irritation follow- this apart from any tissue damage that may exist.

Two basic conditions contribute to lactic acid build-up in muscle and thus, to back pain:

- chronic muscular hypertonicity
- disorganization of the fascial network (connective tissue)

### **Chronic Muscular Hypertonicity**

Chronic muscular hypertonicity may result from long-term performance of repetitive movement (e.g., at work); from long-term emotional distress (i.e., heightened tension), or from trauma (reflexive retraction from pain upon injury that persists through healing). In all cases, muscular tension begins as a momentary response and becomes chronic/automatic through habituation. It often persists even during sleep.

Whether muscular hypertonicity results from pain (i.e., from guarding against pain) or produces it, the results are the same: reduced movement, decreased circulation, and accumulation of lactic acid in the involved muscle tissue.

Habituated contraction can accumulate in "layers" (with multiple episodes of heightened tension), often to crisis proportions, as often happens with back pain.

Habitually tight muscles interfere with movement and interfere with their muscular antagonists; fatigue, stiffness, and soreness result.

Chronic co-contraction of extensors and flexors is one mechanism by which unresolved muscular tension persists. When the extensors and flexors of the trunk co-contrast, they shorten the spine and compress the intervertebral discs; this is a common origin of disc degeneration and radiculopathy.

Whether muscular hypertonicity arises from physical or emotional origin, the result is the same: lactic acid build-up and joint compression.

### **Disorganization of the Fascia**

The fascia is the fibrous matrix that gives shape and tensile strength to tissue; in muscle, fascia is called, "myofascia". In soft tissue, fascia grows or shrinks

according to functional demand. This logic of growth-by-demand creates a pattern of organization visible as the physical person; it also imprints stress and trauma upon the fascial system, present as patterns of disorganization -- contraction and restricted movement. The fascia is thus an organ of memory, whether of healthy function or of dysfunction, as well as of tissue integrity.

The consequences of trauma -- heightened muscular tension, pain, and fatigue -- may thus persist due to disorganization of the fascia. Long-term consequences may include crises of spasm and long-term joint degeneration.

### **Summary of Introduction**

Two basic conditions, muscular hypertonicity and fascial disorganization, can account for many or most cases of chronic back pain.

## **METHODS OF TREATMENT**

We discuss four basic areas of praxis for the treatment of back pain:

- physical therapy modalities
- chiropractic manipulation
- somatic education
- myofascial release techniques

In physical therapy, therapeutic exercise, heat, electrical stimulation, and massage are the usual modalities used to treat back pain.

In chiropractic manipulation, adjustments of vertebral placement shift patterns of compression communicated through the skeletal system.

In somatic education, accelerated sensory-motor learning retrains the central nervous system (CNS) to alleviate muscular hypertonicity.

In myofascial release techniques, soft-tissue manipulation frees adhesions and restriction in the myofascial system.

## **Physical Therapy Modalities**

### **Therapeutic Exercise, Heat, Ice, Electrical Stimulation, and Massage**

Therapeutic exercises may, if properly taught, supervised, and practiced by the patient, improve sensory awareness and voluntary control over muscular tension. Although the rationale behind therapeutic exercises is usually to strengthen muscles, a more precise understanding is that it improves coordination and control of muscles, upon which strength depends. Such exercises, performed ballistically, produce little benefit and may increase pain and spasticity. To produce the most benefit, they must be performed slowly, smoothly, and with due respect for the patient's comfort level (to avoid guarding against pain by tightening further).

Moist heat, applied to the affected area, increases circulation and induces relaxation. Application of ice can numb pain and, through a rebound of circulation to restore warmth to an area, result in removal of lactic acid.

These three approaches are therefore effective ways to flush lactic acid from the soft tissues, and that is the primary benefit.

These modalities are therefore palliative; hypertonicity tends to return.

Electrical stimulation may produce temporary relaxation and mask pain; by inducing increased awareness of the hypertonic muscles, it may also indirectly improve voluntary control over muscular tension.

Muscular activity and massage move fluids from the soft tissues into the bloodstream and lymphatic system, through pumping action.

## **Chiropractic Manipulation**

Bone movement and position reflect muscular pulls and the lines of stress communicated through the fascial system.

Sense receptors in joints communicate bone movement to the Central Nervous System (CNS), which in turn controls muscular tensions associated with posture.

Thus, movement and sensation form a feedback loop for the maintenance of postural alignment.

For bone displacement maintained by muscular tensions of recent (i.e., non-habituated) status, skeletal adjustments can be sufficient to interrupt postural reactions to injury and bring relief.

Muscular tensions of long duration (i.e., habituated status), may reassert themselves after skeletal adjustments. In such cases, relief is brief, as muscular hypertonicity returns, with attendant exacerbation of symptoms. The same limitation applies to traction techniques.

## **Somatic Education**

Somatic education addresses the sensory-motor aspect of the CNS to reduce muscular hypertonicity. It is indicated where residual tension persists after injured tissue has healed or where hypertonicity returns after treatment by conventional methods.

Four forms of somatic education will be discussed, here:

- conventional postural training
- movement training
- assisted pandiculation

## **Conventional Postural Training**

Conventional postural training teaches patients to establish a neutral spine position in movement and to maintain it in all activity. Patients thus limit their movement and tend to maintain protective holding patterns in the musculature ("guarding").

Guarding leads to conditioning into chronic patterns of tension, and patients tend to remain fearful about their injury. An alternative to this choice is to maintain "normal spinal curves". The fallacy of this approach is that there exist "normal spinal curves"; the spine is inherently a flexible structure whose curves

change according to load, position, and emotional tension. This fallacy extends to the use of "lumbar supports".

## **Movement Training**

Movement education seeks to develop balanced agonist/antagonist muscular coordination throughout the body. Where agonist overpowers antagonist (where reciprocal inhibition is interfered with by chronic hypertonicity), postural aberrations result.

For example, in individuals who typically stand with knees locked and feet and legs splayed apart, abductors and the external rotators of the thighs have overpowered the adductors and internal rotators. The pelvis is thrust forward, as a result, the rib cage falls back, and the head, forward. Such a position accentuates the spinal curves and adds strain to the musculature of the neck and thoracic spine.

Movement training optimally uses balanced movements that "reprogram" control of agonist/antagonist muscle pairs. The patterns of movement thus cultivated permit release of more habituated tensions, including those of injury-guarding and emotional distress. As better-balanced movement patterns develop, compensatory muscular responses are less necessary; muscular tensions redistribute themselves and abate. Lactic acid concentration and pain decrease.

Examples of somatic education include Proprioceptive Neuromuscular Facilitation (PNF), The Alexander Technique, The Trager Approach, Feldenkrais Somatic Integration, Rolfing Movement, Hanna Somatic Education, and others. All of these methods use the client/patient's capacity for learning to develop new patterns of sensory-motor integration (coordination). Success depends upon restoring or improving voluntary control of previously involuntarily muscular contractions. Otherwise, states of involuntary contraction interfere with the possibility of establishing new coordination patterns.

## **Assisted Pandiculation**

Pandiculation is an instinctual behavior found among all vertebrates that purges residual tension from the neuromuscular system. Assisted pandiculation systematically triggers the effects of pandiculation through a kind of "eccentric, active- resistive range of motion" maneuver; this maneuver produces sufficient sensory awareness of the involved areas to induce rapid sensory-motor learning. Assisted pandiculation produces a nearly instantaneous, stable reduction of habitual hypertonicity that can, if necessary, be maintained with a few minutes of patterned movement a day. It may be the fastest method known for bringing involuntary (habituated) muscular hypertonicity under voluntary control.

As of this writing, there is only one system of movement education known which uses assisted pandiculation: Hanna Somatic Education.

To be most effective, somatic education must include the whole body (since the neuro-musculo-skeletal system operates as a whole to maintain balance in the gravitational field). All of the methods named above cultivate relaxed or easy balance (grace) in movement and at rest, though some work more quickly than others.

## **Myofascial Release Techniques**

Myofascial release techniques free restrictions of the fascial network that have developed through injury or through growth under chronic muscular tension.

Certain varieties concentrate on symptomatic relief and direct their processes accordingly. The technique developed by Ida P. Rolf, Ph.D. ("Structural Integration") addresses the body as a whole via a systematic, 10-session system that concentrates on improving overall physiological functioning, apart from consideration of symptoms. (Advanced work beyond the basic 10-session series is also done.)

Structural Integration works by guiding the fascia into a pattern of distribution that more nearly approximates their anatomical ideals, as indicated by bony landmarks, joint structure, and the requirements for balance-in-movement, as dictated by the demands of the gravity field.

This process balances the agonist/antagonist pairs, distributes tensional forces in the myofascia, and so allows the core of the body to relax and open. Structural Integration differs from myofascial release, per se, by its systematic approach to postural alignment and balance in movement, and in its recognition of the functional relationship of hard and soft tissues in relation to the gravitational field.

In cases of chronic "poor posture," problems can usually be found in the myofascial system, e.g., twists, thickening, displacement from normal position, etc. Fascia in this state may be very tight and restrictive of movement. Consequently, agonist/antagonist muscle pulls are imprecisely matched and impaired, leading to irregularities of movement, impaired coordination, muscle weakness, and poor postural support. As stated above, chronic fatigue, pain, and postural breakdown accompany myofascial distortions. Neuromuscular compensations, including decreased mobility and unbalanced alignment, ensue.

For example, the shoulder and hip joints are related. In walking, they move contralaterally; at rest, they counterbalance each other: As one hip moves forward, the shoulder above it tends to move backward as a postural reflex. The torso connects the two girdles, hip and shoulder. Compensatory shifts of these girdles twist or distort the spine and rib cage. The combination of a twist, shear forces, and muscle tension adds stress to the whole torso.

For that reason, when treating back problems, the establishment of a dynamically balanced and freely functional neutral spine position requires free movement and reciprocal coordination of the shoulder the hip girdles. The technique of Structural Integration involves (1), placing the displaced part near its position of optimal relationship with its neighboring parts, (2) manually restraining the local myofascia, where disordered, and simultaneously, (3) having the patient/client move the part in a way approximating normal movement. The combination of movement and tissue-restraint repositions the myofascia to a better approximation of the norm.



## SUMMARY

Though varying in etiology and degree of severity, back pain has a common feature: build-up of lactic acid in muscle tissue and resulting irritation. Muscular hypertonicity and postural distortions create pain, facet joint irritation, and radiculopathy.

Disorganization of the fascial network restricts movement and triggers postural responses to overcome those restrictions. Hypertonicity may result from injury (trauma reflex), persistent emotional responses, repetitive movements, habitual poor posture, and/or prolonged immobilization.

Treatment modalities addressing those mechanisms -- through the disciplines of physical therapy, chiropractic, somatic education, and myofascial release -- have been discussed.

## ACKNOWLEDGEMENT

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## REFERENCE

Hanna, Thomas L. *Somatics: Re-Awakening the Mind's Control of Movement, Flexibility, and Health*. Reading, MA: Perseus Books, 1988