

*The following excerpts are from notes I give to my Deep Tissue and Therapeutic Massage students. They help to explain how muscular pain and dysfunction occur and why therapeutic massage can help.*

## THERAPEUTIC MASSAGE & DEEP TISSUE THERAPY

Let's review basic physiology, particularly as it pertains to muscles:

- . The body moves at its joints.
- . Muscles are attached around and over those joints.
- . Muscles contract to effect movement at joints.
  - A chronically contracted muscle will distort the function of a joint
- . Muscles are always in a partial state of contraction (this is called muscle tone)
- . Hypertonic (overly contracted) muscles may not be able to contract further to do work.
- . Muscles and other types of body tissues need adequate blood flow to function properly.
  - Blood flow brings essential oxygen & nutrients to tissues & removes wastes.
  - If this cycle cannot be performed normally, the muscles become toxic & can no longer perform their jobs effectively. Toxicity within muscle tissue can irritate nerve endings, leading to weakness & sensations of pain, numbness & tingling, etc.
- . Blood & lymph vessels & nerves supplying other tissues & regions of the body travel through & under muscles.
- . There are layers of connective tissue throughout, over and around muscle(s) and under the skin.
  - There are many types of connective tissue of varying density and fluidity in the body.
  - CT becomes more fluid when heated or stimulated & more dense & inflexible when stagnant.
  - Hydrogen bonding (a “bunching up” or “gluing” process) occurs in tissue where myofibrils become compressed due to longstanding pressure and immobility. Thus, muscles that were designed to move independently against each other begin to form adhesions that impair their ability to move freely and independently.
    - These excessive accumulations of CT can be felt as fibrous masses within the tissue, as tough fibrotic ropes and cysts within muscle, or as resistant lumpy accumulations around joints.
    - CT/fascia is like any other fabric—a pull from one corner distorts the rest of the structure.
- . Muscles work in groups. Although they have anatomic individuality, they do not have functional individuality. No muscle or compartment acts independently of the many synergistic & antagonistic muscles that relate to its function. Therefore, any contraction in one part will result in lengthening in other parts. An elongation in one part will trigger contractile bracing by other parts.
- . Stress, whether its source is physical or psychological, stimulates endocrine glands to produce hormones. In particular, adrenal glands generate a sympathetic nervous system “fight or flight” response to stress. The first thing that happens in a “fight or flight” response is the mobilization (contraction) of muscle tissue in preparation to either run or fight.

*“If the alarm status is prolonged or repetitive, defensive adaptation processes commence and produce long-term—chronic—changes. In assessing (palpating) the patient, these neuro-musculoskeletal changes represent a record of the attempts on the part of the body to adapt and adjust to the stresses imposed upon it as time passes. The results of repeated postural and traumatic insults of a lifetime, combined with changes of emotional and psychological origin, will often present a confusing pattern of tense, contracted, bunched, fatigued and ultimately fibrous tissue.”*  
(Leon Chaitow)

The following is excerpted from Modern Neuromuscular Techniques by Leon Chaitow (2003):

## **Biomechanical Stress Response Sequence**

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“When the musculoskeletal system is ‘stressed’, a sequence of events occurs, which can be summarized as follows:

- . ‘Something’ (see causes of soft tissue dysfunction below) occurs that leads to increased muscular tone.
- . Increased tone, if anything but short-term, leads to retention of metabolic wastes.
- . Increased tone simultaneously leads to a degree of localized oxygen lack (relative to the efforts being demanded of the tissues)—resulting in ischaemia.
- . Increased tone might also lead to a degree of oedema:
- . These factors (retention of wastes, ischaemia, oedema) result in discomfort or pain.
- . Discomfort or pain leads to increased or maintained hypertonicity.
- . Inflammation, or at least chronic irritation, may be a result.
- . Neurological reporting stations in hypertonic tissues will bombard the CNS with information regarding their status, leading to a degree of sensitization of neural structures and the evolution of facilitation—hyperactivity.
- . Macrophages are activated, as is increased vascularity and fibroblastic activity.
- . Connective tissue production increases with cross-linkage, leading to shortened fascia.
- . As all fascia / connective tissue is continuous throughout the body, any distortions that develop in one region can potentially create distortions elsewhere, so having a negative influence on structures that are supported by, or attached to, the fascia, including nerves, muscles, lymph structures and blood vessels.
- . Changes occur in the elastic (muscle) tissues, leading to chronic hypertonicity and, ultimately, to fibrotic changes.
- . Hypertonicity in a muscle will produce inhibition of its antagonist muscles.
- . Chain reactions evolve in which some muscles . . . shorten, while others . . . weaken.
- . Because of sustained increased muscle tension, ischaemia in tendinous structures occurs, as it does in localized areas of muscles, and periosteal pain areas develop.
- . Abnormal biomechanics occur, involving mal-coordination of movement (with antagonist muscle groups being hypertonic (e.g. erector spinae) and weak (e.g. the rectus abdominis group)).

- . The firing sequences of antagonistic and synergistic muscles alter.
- . Joint restrictions and /or imbalances as well as fascial shortenings develop.
- . Progressive evolution of localized areas of hyperreactivity of neural structures occurs (facilitated areas) in paraspinal regions or within muscles (trigger points).
- . The degree of energy wastage due to unnecessarily maintained hypertonicity leads to generalized fatigue.
- . More widespread functional changes develop—for example affecting respiratory function—with repercussions on the total economy of the body.

In the presence of a constant neurological feedback of impulses to the CNS/brain from neural reporting stations indicating heightened arousal (a hypertonic muscle status is the alarm reaction of the flight/fight alarm response), there will be increased levels of psychological arousal and an inability to relax adequately with consequent increase in hypertonicity. Functional patterns of use of a biologically unsustainable nature will emerge, probably involving chronic musculoskeletal problems and pain.

At this stage, restoration of normal function requires therapeutic input which addresses the multiple changes that have occurred as well as the need to re-educate the individual as to how to use their body—to breathe, to carry and to use themselves—in less stressful ways.

The chronic adaptive changes that develop in such a scenario lead to the increased likelihood of future acute exacerbations as the progressively chronic, less supple and resilient, biomechanical structures attempt to cope with new stress factors resulting from the normal demands of modern living.

### **Causes of Soft Tissue Dysfunction – Causes of biomechanical (musculoskeletal) distress**

The ‘something’ that can contribute to the ‘stress’ sequence described includes:

1. Congenital factors (short or long leg, small hemipelvis, fascial, cranial and other distortions, hypermobility tendencies)
2. Overuse, misuse and abuse (and disuse) factors (such as injury or inappropriate patterns of use involved in work, sport or regular activities)
3. Postural stresses
4. Chronic negative emotional states (anxiety, etc.)
5. Reflexive factors (trigger points, facilitated spinal regions)
6. Pathology (arthritis, etc.)

As a result of the processes described above—most of which affect each and every one of use to some degree—acute and painful problems, overlaid on chronic soft tissue changes, become the norm—the raw material on which bodywork therapies focus.

Forms of stress affecting the body can be categorized as follows: physiological, emotional, behavioural and structural (Barlow 1959).”