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(Hip and Knee).

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**Cyclo-ssage Pro Personal Therapy System [PPTS]
in the current concepts of spinal flexibility part 1
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Spinal Flexibility

Spinal flexibility and conformity are dependent on a complex modulation of extrinsic and intrinsic factors. In this article we will be discussing the former, with particular reference to the effect of alteration of posture by PPTS therapy protocols to improve muscular support for the spine during activities of daily living and sports. In the final segment of the article we will discuss the excellent experience of the PPTS at the Spa-Gym spine care unit.

Pathophysiology of tissue inflexibility

Flexibility is an essential component of all activities. Flexibility is dependent on the integrity of the soft tissues, adjacent joints and supporting bones. Muscles, ligaments and tendons flexibility is the major component of the soft tissue elements that dictates the extrinsic factorial support for the spine.

In the human body, agonist and antagonist muscles work to compliment movement and posture. Agonist and antagonist muscles exert loading forces on the joints.

Over-activity in an agonist group of muscles will often manifest with weakness in the antagonist muscle group and vice versa. Weakness, either relative or true in relation to an agonist or antagonist muscle will generate excessive loads on the adjoining tendons and ligaments. Such loads predispose these soft tissue components to premature fatigue failure with most activities. Fatigue failure of these tissues in its mildest form presents as a muscle or tendon sprain. More severe failures manifest as a partial or full tissue rupture. At the adjacent joint surface, compression forces (crushing effect) are generated on the over-activity region. When the supporting bone structure in that joint fails a wedge compression fracture occurs. On the opposing joint surface, tension forces (pulling effect) are generated on the under-activity region. Failure of the underlying supporting bone in this scenario is through an avulsion fracture.

In humans, the pectoralis major (Pecs), and to a lesser degree the pectoralis minor muscles function to aid pushing activities, while the latissimus dorsi muscles (Lats) muscles function to aid pulling activities. The anatomical locations of these muscles in relation to the spinal column ensure that they act as agonist and antagonist to each other. Consequently, the most essential function of these muscles is in the preservation of spinal flexibility.

When overactive, the Pecs will exert an effect on the upper spine, resulting in an excessive thoracic kyphosis, abnormal spinal loading mechanics and mal-alignment. Additionally, because the Lats are relatively under-used for most activities of daily living, inherent Lats weakness is endemic in most communities.

Rarely, when the Lats are overactive compared to the Pecs, excessive lumbar lordosis results with increased loads on the lower lumbar discs and spinal column.

Why is a flexible spine desirable?

Flexibility in the spine affords the natural contour of the spinal column to transmit load to the lower limbs efficiently. Excessive spinal column loading is the precursor to premature disc protrusion, disc wear, back pain and osteoporotic spinal fractures.

Pro Personal Therapy System [PPTS] experience at Spa Gym for spino-pelvic motion

A positive effect on the latissimus dorsi muscle shape-demarcation and strength was first noted in a small cohort of patients being treated for multi-level chronic disc protrusions and recurrent back pain. In those patients, improved functional scores were correlated with a minimum frequency of PPTS therapy for one and a half hours per week.

Following the retrospective analysis of that group, we devised a training protocol for complimenting the strengthening program of the latissimus muscle. The essential components of the program conclude with a 45 minutes therapy on the PPTS. The therapy period is split as a two part program of twenty and twenty five minutes. The first part of the protocol entails intermittent cycloid pulsatile impulses on the PPTS. Therapy is completed with twenty five minutes of continuous cycloid stimuli. A one year data collection has been initiated for the project.

Early reviews confirmed that the Lats group of muscle gained significant shape-demarcation, strength and exhibited delayed posture fatigue on all assessment tools. Remarkably, all subjects with previous documented presentation of spinal obstinacy exhibited greater range of spino-pelvic motion.

It is our postulation that a larger patient cohort that completes the protocol with Cyclo-ssage PPTS will manifest greater therapy outcomes.

The positive effect of the strengthening protocol and PPTS therapy on the Lats group of muscle is likely due to the large surface area of the muscle, and its exertion (pulling) effect on the spinal column.

Restoring the agonist antagonist balance on the spinal column through Lats PPTS therapy is an effective non-surgical spinal realignment technique for the individual with a predisposition to thoracic kyphosis.