

# **Lumbosacral Strain/Sprain and Orthotic Support by Dr. Mark Charrette**

The lumbosacral region includes the pelvis and the lower spine, as well as the many stabilizing connective tissues and muscles. The joints involved are the lower lumbar intervertebral motion segments (L4/L5 and L5/S1) and the two sacroiliac joints. A strain indicates an injury to muscular (contractile) tissues, while a sprain denotes damage to connective tissues, such as ligaments, fascia, and joint capsules.

Throughout the entire spine - and especially in this region - the muscle layers and connective tissues are interwoven, and the origins, insertions and attachments are complex. With multiple small joints (each with its own capsule), and an elaborate system of muscular and connective tissue layers and interconnections, it is very difficult to have an injury to only one or the other. In certain cases of muscle overuse it is possible to develop a solitary muscle strain. However, because most injuries to the lumbosacral region affect multiple, dense tissue layers, and since many of the local muscles insert into connective tissue, it is usually impossible to differentially diagnose a strain versus a sprain. Almost all injuries to the spine are appropriately recognized as complex phenomena affecting both muscular and connective structures, and properly labeled a strain and sprain.

Many lumbosacral strains/sprains are not true injuries; they are an acute exacerbation of a chronic condition which may be identified with a triggering event or a sudden, uncontrolled movement.<sup>1</sup> Often, the supportive structures have developed a gradual weakening or imbalance. Excessive or repetitive stresses eventually overcome the body's ability to respond, and a breakdown occurs. Treatment of a lumbosacral strain/sprain, then, is twofold: address the acute exacerbation (symptom treatment) first, and then fix the chronic, underlying problem(s) that caused the malfunction.

## **Acute Care**

An acutely painful lumbosacral strain/sprain needs to be treated aggressively to reduce inflammation and control pain. Bed rest is not recommended; patients should be encouraged to move about as normally as possible.<sup>2</sup> "Relative rest" is the current description, and is accompanied by frequent icing of the involved area. This combination reduces pain while preventing the development of disability. Hourly cryotherapy followed by gentle stretching and occasional walking will bring about resolution most rapidly. Some patients benefit from the short-term use of a lumbosacral brace - this allows for more comfortable movement and continued participation in daily activities. Therapy modalities (such as electrotherapy) are useful for decreasing inflammation and pain.

## **Comprehensive Treatment**

Once the pain and inflammation begin to subside, treatment of the underlying lumbosacral problem can begin in earnest. This will require spinal and pelvic adjustments (to improve alignment and range of motion), structural corrections (such as pelvic unleveling, leg-length discrepancy, and pronation) and active rehabilitation (of areas of weakness and instability). In addition, a prevention and wellness plan needs to be recommended to help the patient avoid such problems in the future. A postural, weight-bearing examination will help to uncover some of the initiating factors. Standing X-rays can reveal the presence of an increased sacral base angle, a spondylolisthesis, transitional segments, pelvic unleveling, or the extent of joint and disc degeneration.

Adjustments. Initially, low-force chiropractic adjustments are best tolerated and less likely to aggravate the lumbosacral inflammation. Techniques such as Activator, flexion-distraction, and pelvic blocking are recommended. As the patient responds, more traditional, high-velocity, low amplitude spinal manipulations (such as side-posture and drop-table techniques) are appropriate in order to regain mobility and reduce reflex inhibitions of the trunk support muscles.<sup>3</sup> These adjustments should address very specifically the sacrum, the ilia, and the lower lumbar vertebral bodies. Any anomalies will need to be taken into account during the specific spinal adjusting.

Structural Corrections. When evidence of structural asymmetry is found on a postural exam or X-ray, treatment must address these concerns. Pelvic unleveling may be due to a leg-length discrepancy, which can be functional or anatomical. An increased sacral base angle and/or spondylolisthesis may require that foot pronation be addressed.<sup>4</sup> In fact, excessive pronation of the foot and ankle is a frequent contributing factor to lumbosacral strain/sprain conditions, and needs to be properly supported with flexible, custom-made orthotics in order to respond rapidly and to prevent future recurrences.

Rehabilitation. Some form of aerobic exercise should be introduced as soon as it can be tolerated. Walking is highly recommended.<sup>5</sup> In addition to its aerobic benefits in maintaining general fitness, walking also stimulates the "cross-crawl" mechanism, which improves left/right and flexor/extensor coordination. This also helps to prevent problems which develop from immobilization and lack of movement in injured ligaments and muscles.<sup>6</sup>

Prevention / Wellness. Long-term lumbosacral stability is a combination of balanced strength, sufficient flexibility and joint mobility, and good structural alignment. A regular exercise program with attention to the spinal extensor and gluteal muscles is important. Reducing the peaks of stress to the region is also helpful, especially during aging. If there is substantial degeneration of the lower lumbar discs, shock-absorbing orthotics will help prevent recurrence. The effects of other structural conditions, such as leg-length difference, pelvic unleveling, increased sacral base angle, and even spondylolisthesis, can often be minimized with the use of custom-made orthotics.

### Complete Care Works Best

Chiropractic treatment of patients with a lumbosacral strain/sprain must go beyond the acute phase to include corrective treatment. In addition to spinal and pelvic adjustments, specific exercise recommendations with close monitoring are necessary during the acute, treatment and maintenance phases. Frequently, there is an underlying structural imbalance which must be corrected. Excessive pronation at the foot and ankle is common, and requires custom-made orthotics for resolution. When a complete treatment program is provided, patients will be prepared to maintain their spinal health and will have a deep, personal understanding of chiropractic philosophy.

### References

1. Gatterman MI, Panzer D. Disorders of the Lumbar Spine. In: Gatterman MI, ed. Chiropractic Management of Spine Related Disorders. Baltimore: Williams & Wilkins, 1990:157.
2. Malmivaara A, Kakkinen U et al. The treatment of acute low back pain: bed rest, exercises, or ordinary activity? *N Engl J Med*, 1995;332:351-355.
3. Beimbohm DS, Morrissey MS. A review of the literature related to trunk muscle performance. *Spine* 1988;13:655-660.
4. Yochum TR, Rowe LJ. Essentials of Skeletal Radiology, 2nd Edition. Baltimore: Williams & Wilkins, 1996:363.
5. Shiple BJ. Treating low back pain: exercise knowns and unknowns. *Phys Sports Med*, 1997;25: 51-52, 61-68.

6. Jarvinen MJ, Lehto MUK. The effects of early mobilisation and immobilisation on the healing process following muscle injuries. *Sports Med*, 1993;15:78-89.