

# Intervertebral Differential Dynamics Therapy

By C. Norman Shealy, MD, PhD

The author reviews the evolution of back pain technology and presents results of a study utilizing differential dynamics rehabilitation.

The annals of medicine offer countless examples of widely used diagnostic and treatment protocols that represented the standard of care for the time. Through clinical observation and data analysis, physicians are able to identify necessary refinements for improving outcomes. In essence, an evolution takes place yielding better refined, more effective standards of care.

Consider for example, the standard of care established over six decades ago for diagnosing ruptured intervertebral discs, namely Pantopaque® myelography. Although it provided excellent radiological contrast, twenty-five percent of patients developed adhesive arachnoiditis after a single myelogram — leading to progressive disability far worse than the ruptured disc. Fortunately, MRI replaced the more risky Pantopaque myelogram, giving rise to a more refined standard of care. The MRI, a more specific diagnostic approach, proved highly effective and much less traumatic to the patient.

Now consider one of the standards of care for low back pain. Although some form of spinal traction/distraction was used for centuries, the results were erratic and inconsistent, so that most spinal specialists began to abandon this approach in the 1960's.<sup>1</sup> Then Burton and Nida introduced the concept of gravity lumbar reduction therapy.<sup>2</sup> They literally strapped patients upright in a harness for eight hours a day, for one to four weeks, with results best in patients with ruptured discs. However, the complication of hypotension and eight hours of immobilization doomed this radical approach.

## Back to the Drawing Board

In 1996, the author was asked by an emerging company to evaluate a pneumatic traction/distraction device that reputedly “decompressed” the lumbar spine. The author was shocked to see

patients required to hold themselves in the prone position manually with their arms and hands overhead for 30 minutes of considerable distraction. Five, of six patients interviewed, reported significant shoulder discomfort. The author's attempt on this device resulted in a subluxation of the right shoulder, resulting in several weeks of shoulder pain. Even more troubling was the observation that the prone position actually increased lumbar lordosis — clearly undesirable for optimal spinal dynamics. It occurred to this author that it was definitely no great improvement over the old Hippocratic technique of strapping a patient upright on a door that was dropped out a window!

## Optimal Mechanisms

The author evaluated the mechanisms considered optimal for lumbar decompression, reduction and stabilization. Working with several models, x-ray confirmation, and manual palpation, the following conclusions were reached for optimal mechanical distraction of the lumbar spine:

1. split table separation,
2. flexion of the knees,
3. flexion of the lumbar spine to raise the angle and distraction segmentally,
4. comfort and non-slippage of the pelvic restraining belt,
5. comfort and non-slippage of the chest restraint,
6. concomitant use of TENS, heat, ice and myofascial release,
7. a graduated limbering, strengthening and stabilization exercise program,
8. angle of distraction ranging from 10 to 30 degrees.

In the author's review and experience, as of a decade ago, no single device incorporated all these major factors that are important in achieving clinical results. Yet using these guidelines led to vertebral distraction of 7 to 15 millimeters and good to

excellent pain relief. Of 14 patients having MRI-confirmed ruptured discs with surgery recommended, only one subsequently required surgery. Of eight patients with degenerative disc disease or facet arthrosis, six achieved good to excellent pain relief.<sup>3</sup>

### Device Evolution

Continuing evolution of the technology discussed above has led to further improvements now being incorporated in new generation devices utilizing computer-directed physical therapy of the lumbar spine, along with refinements of treatment protocols employing differential dynamic rehabilitation.

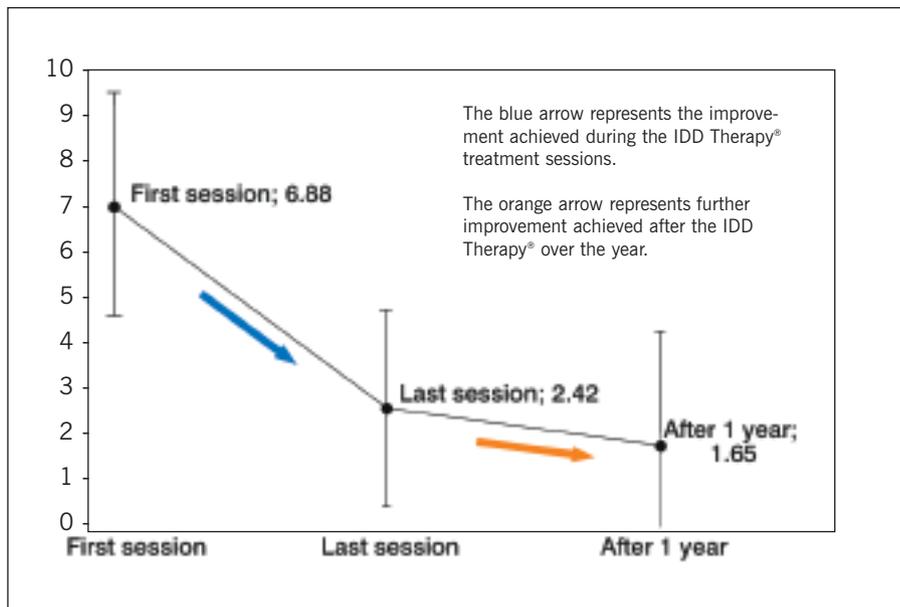
Treatment objectives include freeing a locked facet joint, correcting spinal misalignment which has rendered it dysfunctional, relieving pressure on a nerve root, or bulging disc, stimulating inhibition of annular fluids, restoration and rehabilitation of normal spinal function and the underlying musculature that is typically compromised.

Comfort during the treatment has improved as well as the ability to focus therapeutic force on specific vertebral levels with optimum mobilization, manipulation, and clinical relief. The ability to utilize multiple primary waveforms, as well as a secondary oscillatory waveform designed more specifically to apply a neuromuscular component, further illustrate the progression evolution of this rehabilitative therapy. Active tracking of applied forces, the ability to individualize treatment according to patient needs and the ability to quantify patient response to the treatment regimen pre- and post-therapy sessions further improves therapeutic results.

The device used in the following study was the Accu-SPINA™, manufactured by North American Medical, and utilizing the 'Intervertebral Differential Dynamic (IDD)®' Therapy' protocol.

### Study Results

The author was able, as an independent consultant, to review results currently being reported from ten clinics comprising a cohort of over 500 patients. Improvement rates of 65 to 88% confirm the author's earlier findings regarding differential dynamic rehabilitation. Most importantly, the latest study demonstrates not only an average 65% decrease in pain at completion of IDD therapy, but aver-



**FIGURE 1.** The chart shows mean NPS of 6.88 at the beginning of IDD Therapy® treatment after the completion of treatment the mean NPS is reduced to 2.42 (last session). After a duration of one year the patients continue to improve and the mean NPS is 1.65.

age pain reduction of 76% one year after treatment (see Figure 1, courtesy of North American Medical).

Current exploration of vibration, distraction, oscillation and other adjunctive mobilization adjustments offer even greater potential for the future of inter-vertebral differential dynamics rehabilitation.

### Summary

During the past decade, computerized technology has markedly increased successful outcomes of non-surgical physical therapeutic mobilization for spinal pain, including ruptured discs, as well as locked and degenerative facet pain syndromes. Specific individual spinal segment dynamic mobility leads to satisfactory pain relief and improved quality of life in up to 88% of patients — many of whom have failed other “conventional” approaches. Based on author's review of recent study results, inter-vertebral differential dynamic rehabilitation appears to be the current optimal recommendation for most lumbar pain syndromes. ■

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