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# CLINICAL CARE UPDATE

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## DECOMPRESSION: A TREATMENT FOR BACK PAIN

**Editor's Note:** *Decompression therapy is being widely promoted as an alternative to back surgery for patients suffering from low back pain. There are a number of vendors of decompression systems on the market. This article features one of those products for informational purposes; it is not an endorsement of the product or the technique.*

More than a decade ago, researchers at the National Aeronautic and Space Administration (NASA) were among the first to investigate the effects of spinal decompression on intervertebral discs. They found that astronauts were relieved of low back pain in the anti-gravity state. In addition, they learned that disc height was increased during a space mission.

By combining proven scientific principles with the latest technological developments, a decompression system was developed by a team of physicians and former NASA engineers. The automated system they developed (now marketed as DRX 9000™) has the capability of decompressing discs to relieve pressure on the spinal nerves caused by disc herniations, degenerative disc disease, sciatica, and posterior facet syndrome.

The DRX system uses a mechanized, patented, FDA 510K Level II traction device and it features the only FDA-approved cervical attachment. The system reportedly lowers pressures in discs using a combination of harnesses, air bladders, and disc angle pull adjustments to treat lower back pain in a non-invasive, non-surgical manner. The device differs from manual manipulation and traction devices by reducing intervertebral disc pressure within the spine to -150 millibars.

The decompression system's distracting process has been shown by MRIs to widen disc height space, allowing a decrease in intradiscal pressure while helping the disc reposition itself. This apparently triggers herniation shrinkage, which reduces or eliminates protrusions and pressure on surrounding nerves.

According to the manufacturer (Axiom Worldwide), each treatment is centered on a logarithmic ramp-up, hold, and release protocol implemented by a computerized system designed to bypass proprioceptors that restrict ligaments and muscles when they sense movement at the disc. By comparison, spinal manipulation by physical therapy, traction, chiropractic or osteopathic adjustments cannot bypass the body's protective proprioceptor lockdown response and therefore cannot cre-

ate negative vacuum pressure for extended periods.

In the *New England Journal of Medicine*, an article by Stephen J. Lipson, M.D. ("Spinal Fusion Surgery – Advances and Concerns," February 12, 2004), says 151,000 spinal fusions are done each year in America. He advocates restraint because of the complications and typically modest benefits associated with surgery.

In a recent study utilizing the DRX 9000, of 219 patients with herniated discs and degenerative disc disease, 86 percent who completed the therapy showed immediate improvement and resolution of their symptoms; 92 percent improved overall; five patients (2 percent) relapsed within 90 days of initial treatment.

("Spinal Decompression," Nov/Dec 2003, Vol. 5, No. 6, Thomas Gionis, M.D., and Eric Groteke, D.C., *Orthopedic Technology Review*.)

A study by the Department of Neurosurgery and Radiology, Rio Grande Regional Hospital and Health Sciences Center, University of Texas published in the *Journal of Neurosurgery* (Volume 81, September 1994) demonstrates another aspect of decompression therapy: Intradiscal pressure measurement was performed by connecting a cannula inserted into the patient's L4-5 disc space to a pressure transducer. The patient was placed in a prone position on a vertebral axial decompression therapeutic table and a tensionometer on the table was attached. Changes in pressure were recorded at a resting state and while controlled tension was applied by the equipment. Intradiscal pressure demonstrated an inverse relationship to the tension applied and tension in the upper range was observed to decompress the nucleus pulposus to below -100 mm Hg. The results of this study indicate that it is possible to lower pressure in the nucleus pulposus of herniated lumbar discs to levels significantly below 0 mm Hg when distraction tension is applied according to the protocol described for decompression therapy. The lowest intradiscal pressure measured during progressive traction was 40 mm Hg compared to 75 mm Hg resting supine.

In another study of 778 patients, Gose et al recommend decompression therapy as a primary treatment modality for low back pain associated with lumbar disc herniation at single or multiple levels, degenerative disc disease, facet arthropathy, and decreased spine mobility. ("Vertebral axial decompression therapy for pain associated with herniated or degenerated discs or facet syndrome: An outcome study," *Neurological Research*,

April 1998). Researchers found that pain, activity, and mobility scores all improved after therapy. The researchers demonstrated a success rate ranging from 6 percent for facet syndrome to 72 percent for multiple herniated discs, and 73 percent for patients with a single herniated disc. The average successful outcome for all diagnoses was 71 percent. The authors concluded that for patients with low back pain, decompression therapy should be considered as a front-line treatment for degenerative spondylosis, facet syndrome, disc disease, and nonsurgical lumbar radiculopathy.

### More on Treatment

It is believed that negative pressure created in the nucleus pulposus allows compressed discs to be reoxygenated, rehydrated, and renutriented as they draw in moisture and nutrients from the surrounding body tissues. In this environment, some experts believe the process allows "fibroblasts" to seal tears in the annulus (the fibrous disc tissue which surrounds the nucleus pulposus). This has recently been confirmed with pre- and post-discograms, according to researchers.

Each treatment lasts 30 minutes. The protocol calls for 20 treatments over a six-week period. Decompression therapy is performed on patients while fully clothed. Ice may be applied after treatment. At the conclusion of the treatment series, the patient is given mobilization and strengthening exercises and instructed on ways to avoid re-injury.

Unlike back surgery, decompression therapy can target 85 percent of the stretch to one disc or work on every level of the lumbar spine simultaneously, with residual effects up to T-1. The treating physician can make adjustments in the angle of distraction, position of the spine, and the amount of force needed to decompress at specific intervertebral lumbar disc levels. Regular application of treatments reportedly remodels shortened structures by applying end-range movement to the spine in a controlled manner. Mobilization of the hypomobile joint is used to restore motion.

Inclusion criteria for decompression therapy include: 1) Pain due to herniated and bulging lumbar discs that is more than four weeks old. 2) Recurrent pain from a failed back surgery that is more than six months old. 3) Persistent pain from degenerated discs not responding to four weeks of therapy. 4) Patients available for four weeks of treatment protocol. 5) Patients at least 18 years of age. Decompression therapy is recommended for patients who have low back pain, with or without radiculopathy, who have failed conventional therapy

(physiotherapy and chiropractic), and who are considering surgery. Surgery should only be considered following a reasonable trial of the decompression protocols.

Exclusionary criteria include pregnancy, prior lumbar fusion, metastatic cancer, severe osteoporosis, spondylolisthesis (unstable), compression fracture of the lumbar spine below L-1 (recent), pars defect, aortic aneurysm, pelvic or abdominal cancer, disc space infections, severe peripheral neuropathy, hemiplegia, paraplegia, cognitive dysfunction, cauda equine syndrome, tumors, multiple myeloma, osteo sarcoma, infection, osteomyelitis, meningitis, and disc pathology with a floating fragment.

### Outcomes

Recent clinical research has shown that 86 percent of chronic back pain patients suffering from herniated or bulging discs, facet syndrome, and sciatica reported improvement with decompression therapy. While results vary, most back pain patients who undergo decompression therapy, including those who are long-term chronic or post-surgical cases, are able to resume normal activities. Patients not showing significant improvement by the 15<sup>th</sup> to 18<sup>th</sup> session may be referred for further diagnostic evaluation.

Age, sex, body morphology, smoking, previous surgery, chronic use of narcotic or steroid medications, obesity, and large amounts of daily caffeine may negatively affect the outcome.

With respect to the cost of treatment, 20 decompression therapy sessions cost insurers \$4,000 to \$5,000. By comparison, one discectomy can run as high as \$40,000.

### Summary

A.M. Best Company, a worldwide insurance-rating and information agency, estimates that low back pain costs workers' compensation, insurance companies, and employers more than \$50 billion annually. Some estimates exceed \$100 billion. In addition, many procedures designed to relieve back pain often are not successful.

As decompression therapy becomes better known, patients are likely to look to occupational medicine practitioners as a source of information, referral or treatment. Knowledge about the technique is a good place to start for those who wish to educate their patients about alternatives to surgery or who are considering integrating decompression therapy into their practice.

For additional information, call 877-215-4997, or visit [www.relievawellness.com](http://www.relievawellness.com).