



DRX
SYSTEMS™
INTELLIGENT MEDICAL TECHNOLOGIES™



WHAT IS THE DRX9000®

True Non-Surgical Spinal Decompression System®

WHAT IS THE DRX9000® TRUE NON-SURGICAL SPINAL DECOMPRESSION SYSTEM®?

The DRX9000® True Non-Surgical Spinal Decompression System™ is designed to provide pain relief for compressive and degenerative injuries of the spine. Through the application of spinal decompressive forces to these injuries, the DRX9000® has given patients relief from back pain and has allowed them to resume the activities they love.

WHAT IS SPINAL DECOMPRESSION HOW DOES THE DRX9000® WORK?

Spinal decompression on the DRX9000® involves the application of forces along a treatment curve to elongate the spine without causing the muscles that guard the spine to contract. The technology required to apply spinal decompressive forces is very advanced.



The DRX9000® True Non-Surgical Spinal Decompression System® provides relief of pain and symptoms associated with herniated discs, bulging or protruding intervertebral discs, degenerative disc disease, posterior facet syndrome, and sciatica. The therapy is noninvasive and non-surgical. The theory behind spinal decompression is a process whereby forces are applied to the spine in a manner that maximizes spinal elongation. Spinal elongation is maximized when paraspinal muscles, the muscles that guard the spine from injury, are relaxed. When paraspinal muscles relax, applied spinal decompressive forces spread apart the bony vertebra of the spine. This relieves pressure on nerves and intervertebral discs. Where this spinal elongation occurs, pressure drops within the disc which facilitates movement of fluid, carrying nutrients and oxygen inside the disc. Additionally, the reduction in pressure can help draw in herniated disc fluids, reducing the size of the herniation.

causing the muscles that guard the spine to contract. The technology required to apply spinal decompressive forces precisely is very advanced. Engineering research and development efforts involved in the evolution of the True Non-Surgical Spinal Decompression System™ have been ongoing since 2001!

WHAT CAN I EXPECT DURING TREATMENT?

During each 30-minute treatment session the patient relaxes comfortably on a heavily padded bed. After being secured into position by an upper and lower body harness, the patient can completely relax by watching a DVD, listening to music, or simply taking a nap. Typically, each 30-minute session is divided into 18-phases where spinal decompressive forces alternate between a maximum and minimum therapeutic level. The cycling of forces in this manner appears to create a pumping action that simulates the natural processes responsible for nourishing the intervertebral disc.

WHO ARE THE BEST CANDIDATES FOR TREATMENT?

Anyone who has back pain or neck pain caused in whole or in part by a damaged disc may be helped by spinal decompression therapy. These conditions include herniated, protruding, ruptured, or bulging discs, spinal stenosis, sciatica or radiculopathy (pinched nerves) and other neurological conditions.

WHAT CAN PATIENTS EXPECT DURING THE COURSE OF TREATMENT?

Some patients may experience light side effects with this type of therapy. Mild muscular soreness during or after treatment may occur. The sensation would be similar to what a person might experience at the onset of a new exercise regimen. Most patients find this therapy quite comfortable and relaxing. During an average 30-45 minute treatment, most patients experience a gentle stretch in the lumbar spine and tend to fall asleep. Adjunctive therapies that may be prescribed typically include electrical stimulation and cold therapy. Exercise and/or the use of a lumbar support belt may also be prescribed to support the benefits of spinal decompression therapy and improve patient compliance.



DISC RELATED CONDITIONS

It is difficult to create an effective treatment regimen without first identifying the underlying cause of the pain. These conditions may often be treated non-surgically with the DRX9000.®



A herniated disc (Figure A)

also referred to as a protruding or extruded disc is a condition where a portion of the gel-like center has migrated through the layers of the annulus fibrosus. This can cause mechanical pressure on neighboring structures and trigger chemical reactions resulting in pain and inflammation. These changes will often irritate the nerves, producing numbness or tingling in the legs or feet. Left untreated, this condition may result in life-changing pain and physical disability.



Degenerative disc disease (Figure B)

is a state of dehydration and deterioration marked by the gradual erosion of the disc's ability to distribute and resist mechanical loads. As discs deteriorate, they become more susceptible to injury from physical stress. Degenerative disc disease may also play a contributing role in conditions such as disc bulges, disc herniations, and stenosis.



Facet syndrome:

Facets are the posterior joints of the spine that aid in keeping the vertebrae aligned. (Figure C) Facet syndrome can result from injury or degeneration of the disc and is characterized by pain, stiffness, and inflammation. The pain generally increases with motion and is relieved by rest.

Sciatica is a condition often associated with a herniated or ruptured disc. When the injured disc compresses one of the spinal nerves leading to the sciatic nerve, it can produce a shock-like pain that travels through the buttocks and down one leg to below the knee. Tingling and numbness are common in this condition. Sciatica can occur suddenly, or develop gradually. The pain and symptoms of sciatica can be intensified by coughing, sneezing, or sitting in the same position for prolonged periods of time.¹

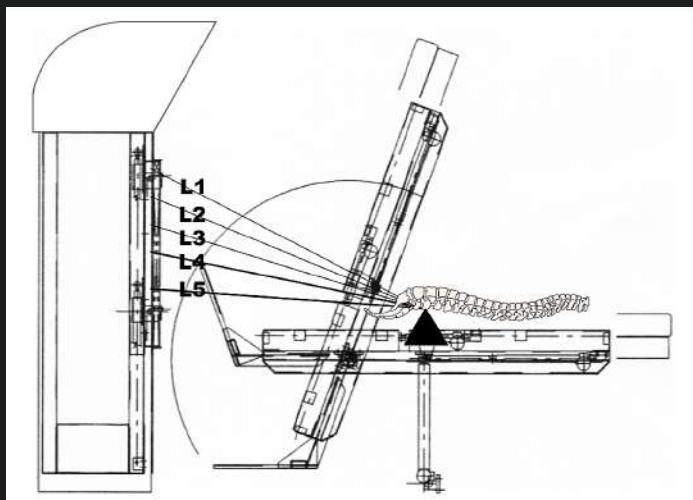
SPECIFIC DISC LEVEL TARGETING

DRX9000® True Non-Surgical Spinal Decompression System™

TREAT SPECIFIC LEVELS

Located below the Pelvic harness is a pneumatic pump and air bladder system. It is this air bladder that maintains the lordotic curve and acts as a fulcrum to the angle of the pull.

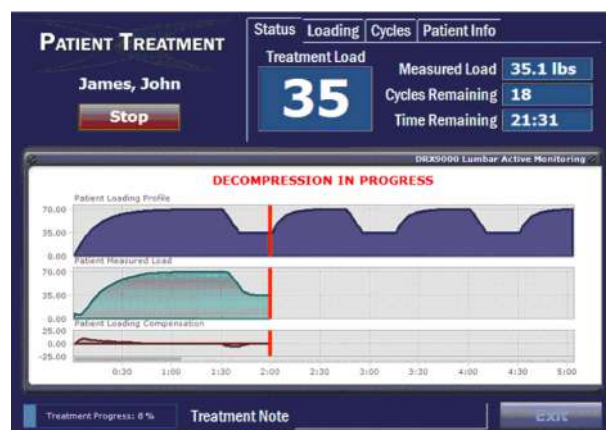
The pull is the key to the DRX9000®'s technology because the pull is generated on a logarithmic curve. Research indicates that by using a logarithmic curve, proprioceptor response is avoided. Therefore, there are no muscle spasms, allowing for decompression in the targeted lumbar disc to occur.



HOW DOES THE DRX9000® WORK?

The DRX9000® utilizes high speed treatment computers to calculate the logarithmic spinal decompression treatment curve for each patient. A servo-motor/ servo amplifier consistently checks (several thousand times per second) and corrects the servomotor's movement. Measurement devices inside the DRX9000® monitor changes in decompressive force experienced by each patient.

All of this data is constantly fed back into the treatment computers. The treatment computers constantly calculate corrections and ensure the therapy is true to each patient's logarithmic curve. This constant monitoring, measuring, and correcting process is called a Nested Closed-Loop Feedback System. This methodology is one of the hallmarks of the DRX technology suite.



NESTED CLOSED LOOP FEEDBACK

in DRX Spinal Decompression
Devices



All of Excite Medical's DRX® devices contain Nested Closed-Loop Feedback Systems that ensure therapy stays true to each patient's logarithmic spinal decompression treatment curve.

Closed-loop feedback can be defined as an automatic control system that can adjust and self-correct its operation according to differences between the actual and desired output. Closed-loop feedback systems improve overall system performance.

Closed-loop feedback can be explained by relating it to a common example:

The temperature control system that heats and cools your home. Using this example, your preferred temperature is set on the thermostat control, which continuously compares the actual temperature reading of your thermometer with your set-point. Whenever the thermometer reading is different than the set point, the generator of warm or cool air is activated.

As a result of this adjustment action, the temperature in your home is adjusted in the direction of your setpoint. This continuous closed-loop adjustment cycle ensures that your home stays at your determined temperature, keeping you comfortable and allowing you to conserve energy.

The effectiveness of closed-loop feedback systems vary based on the variables measured, how they're measured, and how often they're measured. With respect to spinal decompression or traction systems, the measured variable is most often force, which is the amount of tension used to distract the intervertebral segments of the spine.

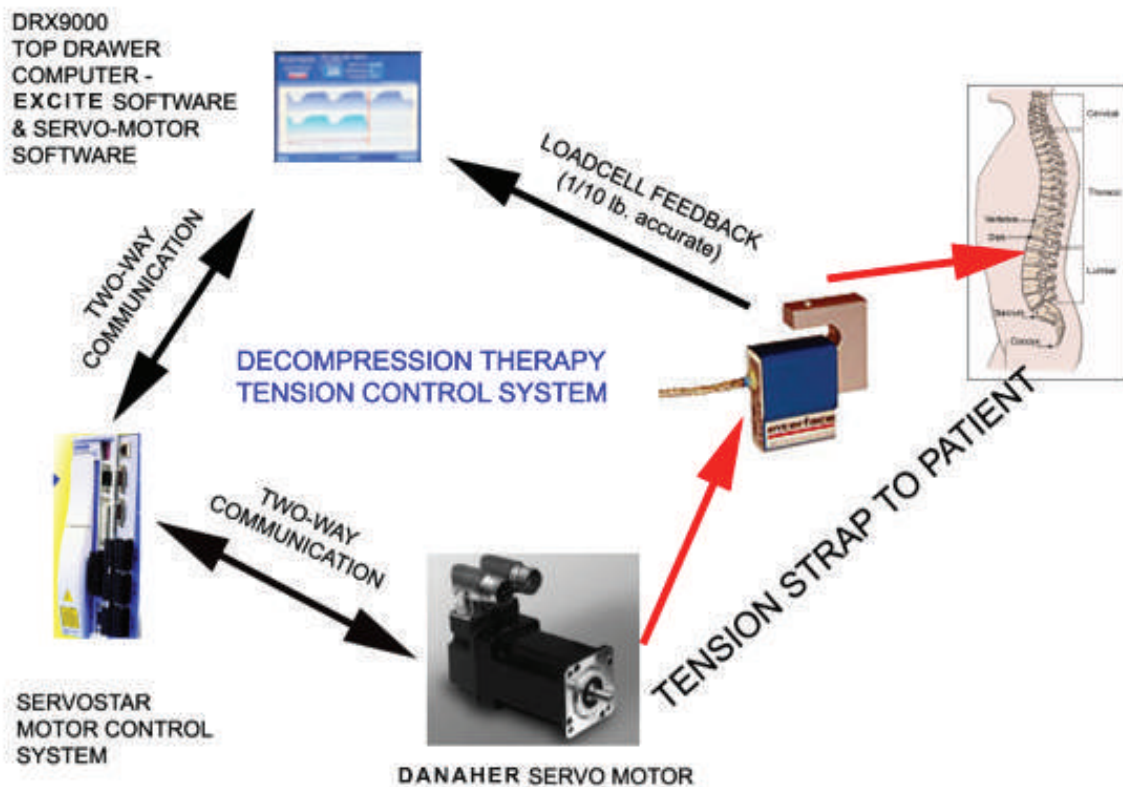
In systems where the lower back is forced to move with the table or motor, fixed measurements are made between the motor and the patient.

In systems that incorporate a floating lower mattress, force is usually measured via the tension strap. How often feedback is monitored varies significantly between currently marketed devices. These rates range from several times per minute, to several times per second, to thousands of times per second.

The DRX™ device series uses a very accurate ($\pm 0.01\text{lb}$) force measurement device to record force on the tension strap during treatment.

This measurement is sent to the treatment computer and is used to calculate corrective spinal decompressive forces. The treatment computer sends corrective force commands 13 x per second to the servoamplifier and servo-motor, which then apply the spinal decompressive forces to the patient. The closed-loop feedback system runs from the force measurement device, to the treatment computer, to the servo-amplifier / servo motor and back again, 13 x per second. Therapy on the DRX™ series of spinal decompression devices takes this concept one step further.

The DRX™ device series incorporates a closed-loop feedback system within a closed-loop feedback system, referred to as nested closed-loop feedback. As described above, one of the three stops on the closed-loop feedback path in the DRX™ devices is the servo-amplifier and servo-motor. The servoamplifier receives corrective force commands from the treatment



computer 13 x per second. The servomotor itself contains very accurate measurement devices that measure position, speed, and power consumption. The servo-amplifier monitors these variables, correcting the actions of the servo-motor 4,000 x per second. This explains the nested closed loop feedback difference that separates the DRX™ series from all other decompression devices.

To summarize, the DRX™ device series contains a closed-loop feedback system that updates the logarithmic force curve 13x per second. Within that closed-loop feedback path exists an additional closed-loop feedback path that updates the logarithmic force curve 4,000 x per second.

Together, these closed-loop feedback paths form a nested closed-loop feedback system. The nested closed-loop feedback system is one of the technological hallmarks of the DRX™ device series.

By utilizing a servo-amplifier and servo-motor system, Excite Medical's DRX™ series of spinal decompression equipment is capable of staying true to the logarithmic force curve. Development of the servo-motion system is an ongoing effort involving both Excite Medical's technical staff and engineers from Danaher-Motion. Danaher-Motion's Kollmorgen Servo Amplifier and Motor and Thompson Planetary Gearhead couple the spinal decompressive forces to the patient.

Excite Medical and Danaher-Motion have formed an exclusive relationship in the spinal decompression / traction market, ensuring consistency and quality and a level of expertise that can only be found in the DRX™ device series.

DRX9000®

True Non-Surgical Spinal Decompression System™

We created the **DRX9000® True Non-Surgical Spinal Decompression System™** to assist healthcare providers in their effort to treat lower (lumbar) back pain.

The **DRX9000® True Non-Surgical Spinal Decompression System™** provides a primary treatment modality for the management of pain and disability for patients suffering with incapacitating low back pain and sciatica.

The **DRX9000® True Non-Surgical Spinal Decompression System™** is designed to provide pain relief for compressive and degenerative injuries of the spine. Through the application of spinal decompressive forces to these injuries, the **DRX9000®** has given patients relief from back pain and has allowed them to resume the activities they love.

FEATURES & BENEFITS

Advanced System Diagnostics

Constantly monitors the device's critical subsystems.

Audio Headphones

Allows patient to listen to music, educational video, music, or movie.

Automatic Shoulder Support System

Improves patient positioning and comfort.

Cervical Pillow

Provides patient comfort and allows patient to view Multi-Media and actual treatment progress.

Floating Lower Mattress

Allows natural elongation of patient's spine.

Knee Rest

Improves patient comfort.

Lumbar Selector

Adjusts system to proper angle for specific lumbar disc treatment.

No-Slip Harness Tensioner

Effortlessly tightens and secures patient harness to bed.

Operator Remote Hand Control

Allows healthcare provider to easily position patient.

Patient Documentation

Prints treatment record for proper patient documentation.

Patient Media System

Provides healthcare provider a tool for advanced patient education through DVD/CD presentation.

Patient Safety Switch

Gives patient the ability to immediately stop treatment if necessary.

Power On Switch & Emergency Stop

15-amp circuit breaker rocker switch initializes system. Stop button immediately releases tension and pressure.

Table Positioner

Automated vertical & horizontal bed tilt positioning.

Touch Screen Computer

Easily select treatment parameters without the need of a separate keyboard and mouse.

Treatment Dynamics

Highly visible displays - monitor treatment from across a room.

Treatment Positioner & Tensioning Cable

Therapeutic forces are delivered to the patient through the tensioning cable, which can be raised and lowered by the treatment positioner.

DRX9000®



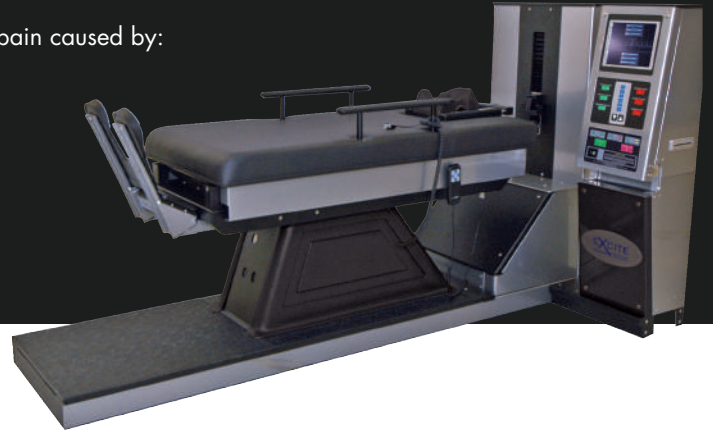
DRX9500[®]

Cervical Decompression Device

The DRX9500[™] is a stand-alone system with an integrated bed that provides a comprehensive approach to relieving neck (cervical) pain.

With the DRX9500[™], healthcare providers can treat patients' neck pain caused by:

- Herniated Discs
- Degenerative disc disease
- Bulging discs



FEATURES & BENEFITS

The DRX9500[™] provides patients a program of treatments for relief from neck pain. Application of cyclic forces decompresses intervertebral

discs, achieving pain relief associated with herniated discs, protruding discs, degenerative

disc disease, posterior facet syndrome, and bulging discs.

Cervical Selector

Adjusts system to proper angle for specific cervical disc treatment.

Non-Detachable Headrest features:

- Conforming head support
- Automatic Cervical Isolator
- Automatic Locking System
- Open design doesn't grab jaw

Patient Documentation

Prints treatment record for proper patient documentation.

Treatment Dynamics

Highly visible displays - monitor treatment from across a room.

Patient Safety Rails

Assists patient entry and exit.

Patient Safety Switch

Gives patient the ability to immediately stop treatment if necessary.

Platform Scale

Weight scale data transfers directly into treatment computer.

Power On Switch & Emergency Stop

15-amp circuit breaker rocker switch initializes system. Stop button immediately releases tension and pressure.

Operator Remote Hand Control

Allows healthcare provider to easily position patient.

Table Positioner

Automated vertical & horizontal bed tilt positioning.

Touch Screen Computer

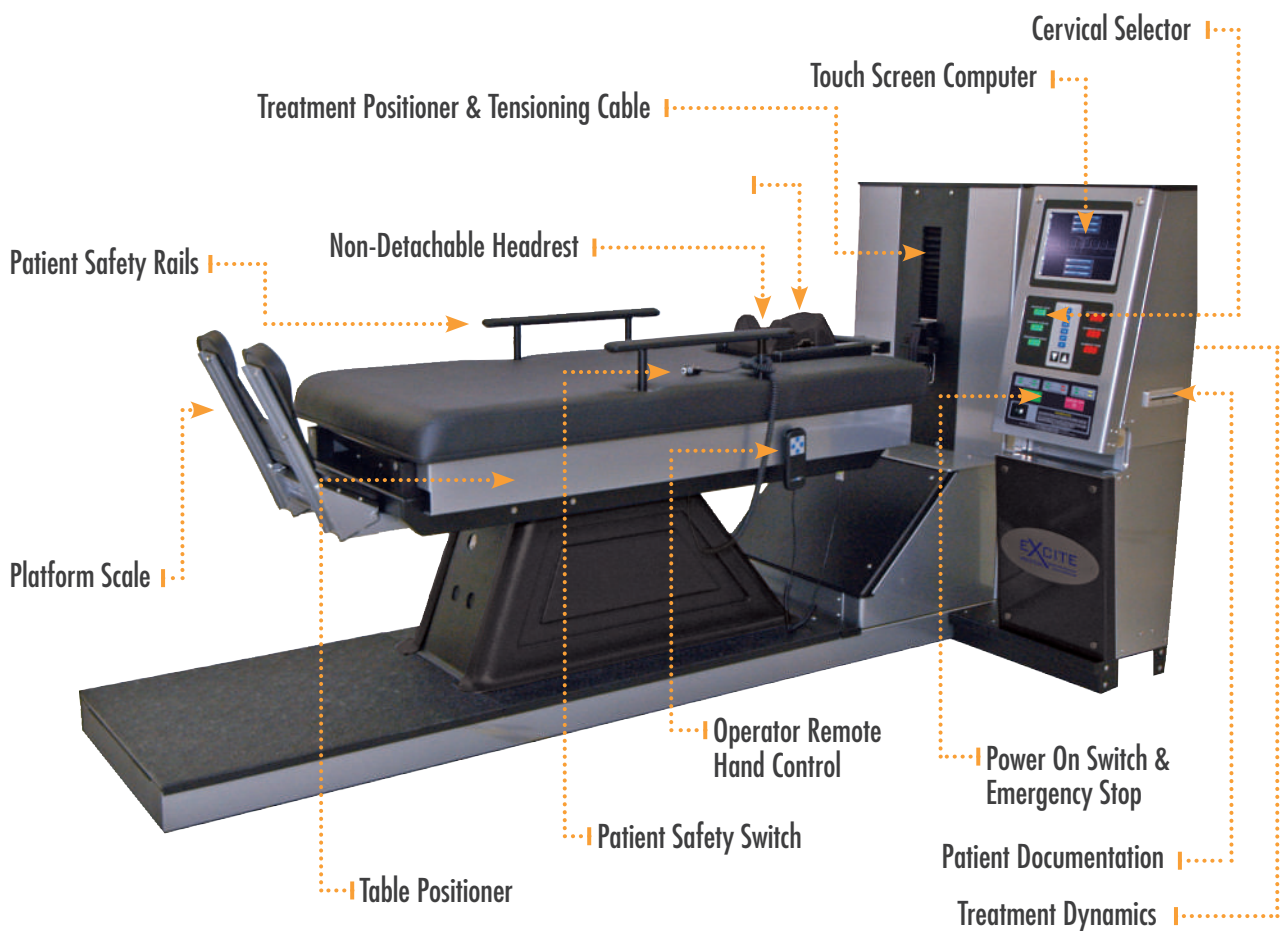
Easily select treatment protocol without the need of a separate keyboard and mouse.

Treatment Positioner & Tensioning Cable

Therapeutic forces are delivered to the patient through the tensioning cable, which can be raised and lowered by the treatment positioner.

DRX9500[®]

Stand Alone Cervical Unit



PUBLISHED RESEARCH

2010

Restoration of disk height through non-surgical spinal decompression is associated with decreased discogenic low back pain: a retrospective cohort study

BMC Musculoskeletal Disorders 2010, 11:155

- Christian C. Apfel, MD, PhD.
University of California San Francisco
- Alex Macario, MD
Stanford University
- Ozlem S Cakmakkaya, MD
University of California San Francisco
- William R. Martin, MD
Upper Valley Interventional Radiology
- Charlotte Richmond, PhD.
NEMA Research, Inc.
- Alex Macario, MD
Stanford University
- Elizabeth George
University of California San Francisco
- Maximilian Schaefer
University of California San Francisco
- Joseph V Perolizzi Jr, MD
Johns Hopkins University

Pilot: Effectiveness & Safety of Non-surgical Spinal Decompression

The Journal of Medicine, December 2008, Vol1, Issue 1

- John Leslie, MD
Mayo Clinic Arizona
- Charlotte Richmond, PhD
NEMA Research, Inc.
- Alex Macario, MD
Stanford University
- Christian Apfel, MD
University of California
- Darren Clair, MD
Vibrance Medical
- Martin Auster, MD, MBA
John Hopkins University
- Joseph V Pergolizzi Jr, MD
John Hopkins University

Treatment of 94 Outpatients with Chronic Discogenic Low Back Pain with the DRX9000®: A Retrospective Chart Review Pain in Practice, Vol 8, Issue 1, 2008 11-17

- Alex Macarino, MD
Stanford University
- Martin Auster, MD, MBA
John Hopkins University School of Medicine

2008

Management of Low-back Pain with a Non-Surgical Decompression System(DRX9000®) - Case Report

European Musculoskeletal Review, Vol 3, Issue 1, 2008

- Joseph V Pergolizzi Jr, MD
John Hopkins University
- William Martin, MD
Upper Valley Intervention Radiology

Management of Discogenic Low-back Pain with a Nonsurgical Decompression System(DRX9000®) - Case Report

US Musculoskeletal Review 2008, Vol3, Issue 1, 14-15, 2008

- Joseph V Pergolizzi Jr, MD
John Hopkins University
- Terry Yochum, DC, DACBR, Director
Rocky Mountain Chiropractic Radiology Center
- Brian S McCain, DC
Back in Action Spine and Health Centers

2007

Magnetic Resonance Imaging Findings after Treatment with a Non-surgical Spinal Decompression System(DRX9000®): Case Report

US Musculoskeletal Review 2007;2;50-52

- Jonathan M. Wilhelm, DC, CCEP
Big Sky Spine Care
- Martin Auster, MD, MBA
John Hopkins University School of Medicine

Non-surgical Spinal Decompression to Treat Chronic Low Back Pain Special Report

Anesthesiology News-Pain/Medicine News, 2007

Treatment of an L5/S1 Extruded Disc Herniation Using a DRX9000 ® Spinal Decompression Unit: A Case Report

Chiropractic Economic, Vol 53: Issue 2, 2007

- Terry Yochum, DC, DACBR, Director
Rocky Mountain Chiropractic Radiology Center
- Chad J. Maola, DC

INTERNATIONAL RESEARCH

2007 India

Non-surgical Spinal Decompression Treatment of Low Back Pain by Spinal Decompression and Spinal Exercises

- Malti Hiranandani, Chief Physiotherapist
The Back and Neck Clinic, Hyderabad, India, 2007

In this clinical trial study, 65 patients received treatment including the DRX9000®, moist and ice packs, pain relieving and muscle strengthening modalities. Several disc disorders were treated such as bulging, protruding, extruded, multilevel degenerative, desiccated, stenotic, and post-surgical recurrence. Spinal decompression was found to effectively treat low back pain.

2006 Russia

Clinical Studies for Spinal Decompression Neurology Unit of Municipal Clinical Hospital, May 13-July 24 2006

- G.N. Minukov, Manager of Neurology Unit
- E.V. Vorobiev, Doctor of Neurology Unit

2006 Korea

Non-Surgical Decompression Therapy

- J.K. Park, MD

2006 Japan

Effects of Spinal Decompression(DRX9000®) for Lumbar Disc Herniation

The Journal of Saitama Kenou Rehabilitation, Vol 6, November 1, 2006

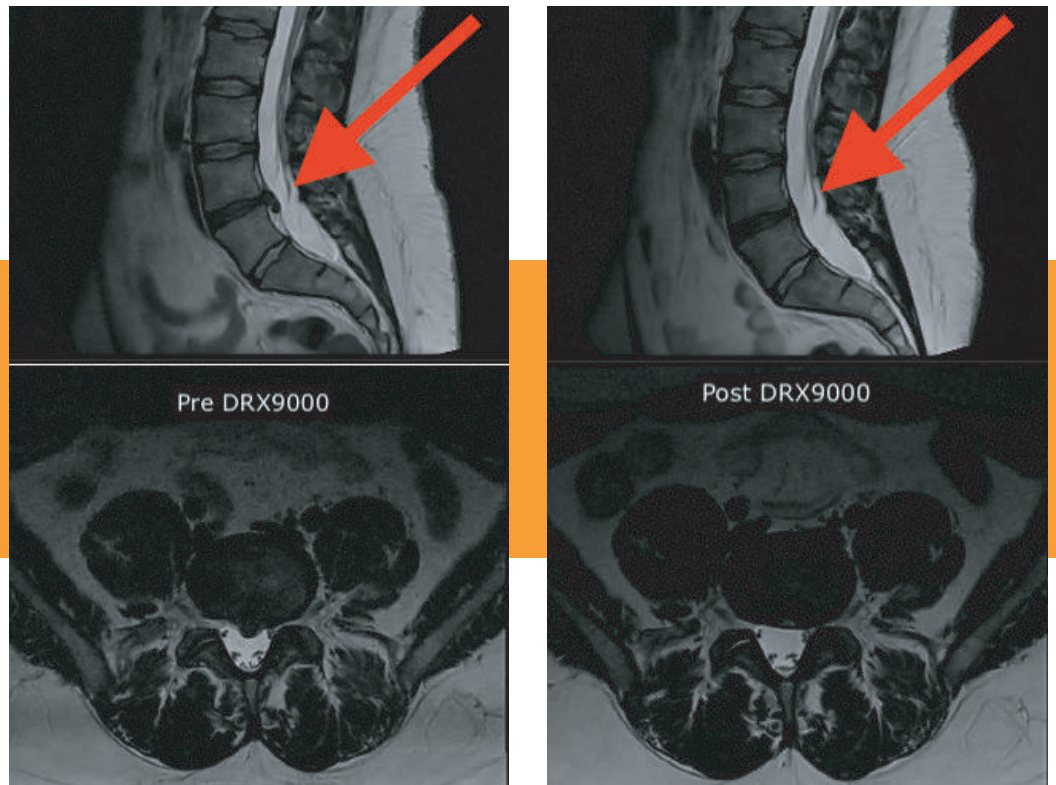
Naoyuki Oi(1), Akira Itabashi (2), Shusuke Kasano (3), Mitsuro Yamamoto (1), Mutsuo Yamada (1), Yasuyuki Yakakura (1), Keigo Kumamoto (1), Tetsuo Suyama (1)

- 1) Dept of Rehabilitation Medicine, Saitama Medical University, Saitama Medical Center
- 2) Saitama Center for Bone Disease
- 3) Dept of Rehabilitation Medicine, International University of Health and Welfare, Mita Hospital

2019 CASE PRESENTATION

CASE PRESENTATION

It's all in the pictures



SOURCE:

<https://irp-cdn.multiscreensite.com/961>

A 28-YEAR-OLD BANK TELLER presented with a one-year history of lower-back pain radiating down his left lower extremity, associated with numbness and tingling sensation down the left leg in the L4 and L5 dermatomal distribution. The symptoms were interfering with the patient's work and sleep. Prior to his initial visit with Dr. Mustafa Hammad, he underwent six weeks of physical therapy and was treated with NSAIDs, opioids and Lyrica without any relief. A pre-treatment MRI (figure 1) revealed moderate disc herniation at L4-5 level touching the L4 and L5 nerve roots on the left. The patient underwent 20 treatment sessions on the DRX9000 over a six-week period

A follow up MRI, one month after the last treatment (figure 2) reflected almost total resolution of the herniated L4-5 disc, with improvement in disc morphology, disc height, and neural canal AP diameter at the L4/5 level. Clinically the patient had total resolution of his symptoms. After a one-year follow-up with the patient, he was still symptom free and a repeat MRI still showed no changes from the previous post-treatment MRI.

Mustafa A. Hammad, MD, DO, DABIPP, FIPP, FACP, CPI, FAAN, owner of The NeuroMedical Institute, is boardcertified in neurology, pain medicine and interventional pain management using the DRX900. He can be reached via inewromed.com.

DRX[®]

Dimensions




2.5m x 3.1m
Room Requirement
8'x10'

85.50 in (218cm)

113.00 in (288cm)

DRX9000 DIMENSIONS:

Length	(Overall) 113.00 in (288cm)
Width	32.50 inches (83cm)
Height	85.50 inches (218cm)
Weight	1,280 lbs. (580 kg)
Crated Weight	1,730 lbs. (784 kg)



3.1mx3.7m
Room Requirement
10'x12'

85.50 in(218cm)

126.00 in (321cm)

DRX9000 WITH DRX9000C DIMENSIONS:

Length	(Overall) 126.00 in (312cm)
Width	32.50 in (83cm)
Height	85.50 in (218cm)
Weight	1,780 lbs. (807 kg)
Crated Weight	2,530 lbs. (1147 kg)




57.00 in (145cm)

112.00 in (285 cm)

DRX9000 DIMENSIONS:

Length	(Overall) 112.00 inches (285cm)
Width	52.00 inches (133cm)
Height	57.00 inches (145cm)
Weight	850 lbs. (385 kg)
Crated Weight	1,150 lbs. (521 kg)



52.00 in (133cm)

57.00 in (145cm)

DRX9000C ONLY DIMENSIONS:

Length	(Overall) 35.50 in (91cm)
Width	52.00 in (133cm)
Height	57.00 in(145cm)
Weight	500 lbs. (226kg)
Crated Weight	800 lbs. (362kg)



For more information about the DRX9000® or the DRX9500®, please contact an Excite Medical representative.

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