

# Spinal Decompression Therapy, Part 2

*An overview of the technique and the technology involved*

*In part 1, the author discussed the importance of conducting a thorough consultation and examination prior to non-surgical spinal decompression therapy (SDT) in order to select the most suitable patients and to deselect those who should not receive the therapy. The benefits of doing this, to the doctor and the patient, are many and undeniable. In part 2, the background to, and methodology of, non-surgical SDT, will be discussed. As well, Dr. Nusbaum will examine the technology for performing this procedure.*

## FIRST, A WORD ON TRACTION

Traditional traction has been in use clinically for thousands of years. Traction has shown some clinical benefits; however, its impact is non-specific. Cox technique, developed in the 1970s by Dr. James Cox, employed flexion, extension, lateral bending and long y-axis distraction as part of a system used in conjunction with spinal adjusting. But in the strictest terms, this is not traction or spinal decompression. Non-surgical SDT was developed as an improvement to the older traction methods.

Non-surgical SDT officially appeared clinically in the 1980s and, when properly executed with appropriate candidates, has throughout its development been meeting with highly encouraging success.

Two key differences between traction and non-surgical spinal decompression are:

1) Non-surgical SDT allows the practitioner to change the angulation of the pulling forces to the patient. The ability to target the pulling forces gives the practitioner control of the region requiring care, thus making SDT more specific than traditional traction. The practitioner can direct the forces over a narrower area to deliver greater magnitude of pull in the desired region. The primary disc lesion will be impacted the most, with some forces affecting the level above and below. This specificity achieves a greater therapeutic effect than traction is capable of.

2) The pulling pattern with non-surgical spinal decompression reduces potential muscle reactive resistance and spasm.

## HOW SDT WORKS

In some cases, post-non-surgical SDT MRIs have shown reduction of bulge and herniation. Normal lumbar intra-disc pressure can be as high as 180 mm of mercury. Spinal decompression therapy is reported to reduce intra-disc pressure to as low as minus 160 mm of mercury. It is believed that the negative pressure created by non-surgical SDT is responsible for disc bulge/herniation retraction, as well as rehydration. This results in a reduction of neurological irritation responsible for both local and radiculopathic pain.

The patterning of forces used in SDT attempts to fool muscular proprioception from triggering reactive muscle contraction in response to the pulling forces. In so doing, maximum segmental decompression can be applied with the ultimate goal of successfully reducing intra-disc pressure to therapeutic levels. The load or pulling profiles in all cases vary in a cyclical manner, rising to a maximum load measured in pounds and then falling to a minimum load. These parameters are dependent on the patient's weight and condition, and may be adjusted within the patient's comfort level. Most technologies available offer subtle variations in the pulling profiles, which may be chosen based on varying patient presentation circumstances. The magnitude of the pull, in all cases, is dependent on the patient's weight.

(The pulling force pattern utilized by SDT technology was developed based on conclusions made by the Weber-Fechner law in the late 1800s, which describes the relationship between stimulus and perception – weight, vision, sound, etc. – as logarithmic. Weber-Fechner determined that as stimulus strength is multiplied, the perception of the increase is perceived in an additive manner. These conclusions, when applied to weight perception, were used to develop a pattern that is referred to as a reverse logarithmic curve. This pattern is utilized in

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most decompression technology today, particularly in the area of weight perception.)

Variable angulation of decompression forces combined with the *pattern* of forces makes non-surgical SDT more focused and more effective than simple traditional traction.

## METHODOLOGY

**Patient Positioning.** Two critical factors impact the effectiveness of non-surgical SDT machines:

1. correct patient positioning on the device, and
2. appropriate selection and positioning of the angulation of the decompression forces.

Spinal decompression technology relies on the assumption that the patient's spine is in a specific predictable position during care, so that changes in the angulation of the decompression pulling mechanism can be carefully and precisely adjusted to target the disc(s) requiring care. To reduce possibility of error in positioning, specific landmarks on the different pieces of technology must align with specific patient anatomical landmarks used, in turn, for locating specific spinal segments.

Regarding *lumbar* spinal decompression, the practitioner relies on the location and position of the anterior superior iliac spine (ASIS), corresponding to the L5 vertebra, for the purposes of preparing the patient for a lumbar disc decompression session. The practitioner directs the angle of applied decompression forces either manually or automatically, depending on the machine.

The procedure for positioning a patient for *cervical* SDT is similar in concept, but utilizes a unique harnessing system with adjustable pulling angulations.

**Angulation Adjustment.** The angle at which the pulling force meets the patient is adjusted to target the precise disc area requiring care.

**Treatment Time and Frequency Protocol.** Most SDT treatment follows a similar protocol. It typically involves three to five sessions in the first week, and three to four sessions in the following weeks. A program is typically four to six weeks long. Practitioners must employ sound judgment based on ongoing objective evaluation to determine if the number or frequency of visits must be adjusted down or up, or discontinued altogether. The protocol used must be that which will maximize each individual's healing potential.

**Pre- and Post-Session Care.** Many practitioners offer heat treatments to patients prior to each session. This helps relax the perispinal musculature of the affected region. It is common practice for patients to receive ice treatments after each session.

**Active Rehabilitation.** Some practitioners introduce active rehabilitation of the lumbar/cervical spine early in a patient's care program. Others offer active rehab in stages, towards the middle and then the end. The goal is to help patients restore and improve flexibility and strength, including core strength. Some practitioners also use modalities including various supports ranging from lumbo-sacral belts and orthotics. Some also add nutritional supplementation to their patients program of care.

## MACHINES

Today a variety of non-surgical SDT machines are used. They have several features in common:

- The motor responsible for the pulling forces is always under the control of the practitioner.
- There are a number of pre-set programs that control the

decompression forces in frequency, cycles, load magnitude and duration of individual treatment; non-surgical SDT table manufacturers boast unique pulling patterns.

- Lumbar spinal decompression therapy requires the patient's chest region to be harnessed to a part of the bed, often with shoulder posts restraining the arms. This immobilizes the patient's upper body, enhancing the decompression forces; a cable from the motor connected to a pelvic harness (also worn by the patient) delivers decompression forces, pulling caudally towards the motor.
- Cervical decompression utilizes a harnessing system, as well, with decompression forces that are adjustable in angulation, magnitude, duration as well as frequency.

There are also variations among the machines, including:

- Harnessing methods vary for lumbar and cervical treatments.
- In simpler machines, the angulation of pulling is altered manually by the doctor, usually by raising or lowering the vertical position of the motor. More sophisticated machines have automatic adjustment by way of pre-set buttons that correspond to specific disc levels. The angle can be further adjusted manually, by degrees, if needed. (Note: This changes the height of the cable as it exits the tower containing the motor – not the position of the motor itself.)
- The more advanced machines offer computer automated controls as well as monitors that display, in real time, the patient loading or pulling forces as well as the patient's muscular response to care.
- Some tables transfer the pulling forces via a direct drive-shaft system. Others utilize a belt system.
- Most tables have some kind of biofeedback/tensiometer system responsible for monitoring and adjusting the magnitude of the pull in response to changes in the patient's muscle tone.
- More sophisticated beds use a hi-lo system to easily board patients onto the bed, from a standing posture. Other systems require the patient to climb onto a horizontal bed.
- Most systems have the patient positioned supine while under care. Some machines position patients prone. One system requires the patient to be in a seated position.
- Specific technologies exist whereby the practitioner may change the patient's pelvic position, either manually or by controls, to assist in the procedure.
- Some tables have a bed that separates a few inches in the early stages of a session to enhance the decompression.

Patients today are more informed than ever before. When they arrive for a consultation, they have often done extensive research on their particular condition, and have consulted with peers and professionals. They ask intelligent questions and expect exemplary care. They are wise to the fact that there is technology available that was created specifically to assist in the healing of disc problems.

At the same time, they know that technology is only as good as the doctor running it. Chiropractors can assure each patient that they will receive the most robust and effective care because we are meticulous and appropriate in our work. With non-surgical SDT technology, we must remember that success begins with correct selection of patients, and builds when the patient is positioned and harnessed correctly and the appropriate angulation and decompression force pattern is utilized. Only then can the technology deliver best results. •