

**Short-Term Effect of Spinal Manipulation on Pain Perception, Spinal Mobility, and Full Height Recovery in Male Subjects With Degenerative Disk Disease:  
A Randomized Controlled Trial**

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List of abbreviations:

CG control group  
DD disk degeneration  
FFD finger-to-floor distance  
HVLA high-velocity, low-amplitude  
IVD intervertebral disk  
LBP low back pain  
ROM range of motion  
SLR straight-leg raise  
SM spinal manipulation  
TG treatment group  
VAS visual analog scale

KEY POINTS FROM THIS STUDY:

- 1) Lumbar intervertebral disk disease is one of the main causes for low back pain.
- 2) Disk degeneration is the “most common pathology in the adult spine and accounting for approximately 90% of surgery cases.”
- 3) “Subjects with symptomatic disk disorders incur the highest health care expenditure among those with other LBP diagnoses.”
- 4) “Structural disruption of the IVD (loss of the hydrostatic capacity of the nucleus) during DD may end up leading to a loss of IVD height and a possible reduction of spinal range of motion (ROM).”
- 5) “Spinal Manipulation has been demonstrated to decrease pain and improve function in symptomatic lumbar disc degeneration.”

6) The purpose of the study was to evaluate, in subjects with lumbar disc degeneration, the immediate effect of a lumbosacral HVLA SM on:

A) The subjects' height via stadiometer

"The cumulative effect of the IVD loss of fluid in response to mechanical stress may change the subject's measured height (spinal shrinkage)." "The stadiometer measures height variations and the amount of IVD compression caused by pressure on the spinal column." "The stadiometer is a noninvasive method that has proven validity and is easier to use and less costly than MRI."

B) Self perceived LBP (using a visual analog scale [VAS])

"The VAS is an effective, sensitive, and appropriate tool to measure acute and chronic pain."

C) Neural mechanosensitivity

"Neural mechanosensitivity was observed by means of the passive straight-leg raise (SLR) test." The point of initial appearance of pain or discomfort was the test endpoint, and was measured with a goniometer. The test is considered an easy-to use tool, with a reliability of 87%.

D) Spinal mobility in flexion

Spine mobility in flexion was measured as finger-to-floor distance (FFD). This test is considered easy to conduct and has a high degree of inter-examiner reliability (96-98%).

7) This is a randomized, double-blind, controlled clinical trial that evaluated 40 men with an average age of about 40 years. All subjects had degenerative lumbar disc disease at L5-S1. Twenty of the men were randomly assigned to receive a side-posture L5-S1 manipulation. The spinal manipulation was a standard side-posture very fast thrust with a short ROM. The other 20 men were given a single placebo intervention. The placebo maneuver (sham) was also side-posture set up but involved no manipulative thrust.

### **Measured Outcome Improvements in Men with Degenerative Disc Disease Following a Single Side-Posture Spinal Adjustment**

(rounded)

<b>Measurement</b>	<b>Outcome Improvement</b>
Height (stadiometer)	4 ± 1 mm
Pain (VAS)	Reduced by 46%
Neural Tension (SLR)	Increased by 14° ± 9°
Spinal Mobility (FFD)	Increased by 4 ± 2 cm

8) **Height Change Sadiometry:**

- "A significant height change was found in the TG:" (3.98 ± 1.46 mm).
- The increase in paravertebral muscle activity in chronic LBP is associated with greater compressive loads. "The impact of SM on 'gapping' and on diminishing paravertebral hyperactivity may produce changes in stadiometry."

9) **Visual Analog Scale (VAS):**

"The lumbosacral SM achieved an immediate reduction in self perceived LBP." Pain perception decreased by 46% in relation to baseline.

10) **Neural Tension Straight Leg Raise (SLR):**

The passive SLR test increased in the TG by 14° ± 9° (rounded).

11) **Spinal Mobility Finger-to-Floor Distance (FFD):**

Spinal mobility during the FFD test was increased in the TG by 4 ± 2 cm. (rounded). It appeared that "SM modulates the somatosensory system, which inhibits the paravertebral muscle hyperactivity and improves spine functionality, among other effects."

12) The authors concluded; "An HVLA SM in the lumbosacral joint performed on men with degenerative disk disease immediately improves self-perceived pain, spinal mobility in flexion, hip flexion during the passive SLR test, and subjects' full height."

13) "A side-lying SM technique in the lumbosacral region decreases self-perceived LBP in the short-term and produces an immediate improvement in spinal mobility in flexion, the subject's height, and hip flexion mobility during the passive SLR test in men with DD."

14) The intragroup comparison indicated a significant improvement in all variables in the spinal manipulation group compared to the control group. "In the between-group comparison of the mean differences from pre- to post intervention, there was statistical significance for all cases."

15) It has also been concluded that HVLA lumbosacral SM displays a short-term impact on the attenuation of alpha motoneuronal activity. This seems to be linked to a reduction of muscle tone and pain perception.

16) "However, only the mechanical effect from the thrust appears to be a key element to the effectiveness of the SM."