Many researchers discuss spinal “instability” as having, at least in part, disc degeneration and loss of disc height through nuclear dessication as its origin (Spine 2005: Discogenic origin of spinal instability). The sequence of events is not fully understood but as Bogduk and others have proposed for decades internal disc disruption (IDD) from end-plate damage early in life sets the stage for nuclear breakdown that progresses over years (typically painlessly). This can render stability changes as the discs’ hydrostatic properties, resiliency and strain adaptation slowly fails. The NZ (neutral zone of intersegmental motion) enlarges...diminishes...enlarges, etc. over many years with each new strain or sprain rendering either an enlarged NZ (greater intersegmental motion i.e. “instability”) or a lessened NZ more “stability” at that level.

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Interestingly this concept is further supported in recent motion MRI studies which show low back pain patients typically have hypermobility at L5 versus a control group without pain. As P-A pressure and extension is introduced the L5 segments in the cLBP patient group demonstrate what is determined to be excessive intersegmental motion. As to the theory of hyper- versus hypomobility causing pain, it appears they both can be part of the problem. Thus a proper patient classification assessment becomes vital — though at this point is still lacking. Perhaps as technology develops and MRI costs diminish (unlikely as that may be) every patient can be checked in motion.

In a 2010 study published in BMC Musculoskeletal Disorders, authors Apfel, et al., did a retrospective cohort study showing restoration of some disc height (associated
with reduced LBP) was achieved through a course of spinal decompression therapy over 6 weeks. Albeit there are weaknesses to the study but these authors (and others including Cyriax) suggest it may be possible to enhance the nuclear volume of the proteoglycan water absorbing matrix via controlled and repetitive axial traction. Moderately strenuous exercise involving resistance training has also been shown to enhance overall height via stadiometry. These height changes being attributed to the discs ability to better absorb water during unweighted rest, as well as more efficient leverage arms of the spinal muscles. Pairing spinal decompression and exercise is an obvious winning combination.

We have seen post MRI’s of discs described as “moderately desiccated” being either re-assessed as normal or mildly desiccated after 3 months of regular traction and exercise, including weight lifting. Several researchers have discovered increased inducible vertebral displacement (hypermobility) after lumbar discectomy result in poor clinical outcomes. Apparently perhaps “instability” in these cases was either induced via the surgery deflating the disc (reducing its inherent motion limiting capacities) or not addressing the pre-existing hypermobility with an appropriate fusion. The increased translational motion was only 1mm at L5/S1 — clearly indicating minimum changes in the NZ; allowing tiny translations and rotations to occur can spell trouble. Additionally they noted at L5/S1, that patients with good outcomes at discharge and 5 year follow-up had decreased motion at that level, i.e. greater “stability.”

Disc stiffness and to a certain extent its compression adaptation is lost with excess degenerative changes. Disc stiffness and to a certain extent its compression adaptation is lost with excess degenerative changes. Spondylosis is tantamount to evacuating the oil from a hydraulic cylinder and continuing to ask it to per-
form. Unlike machines however, living adjacent tissues will adapt over time to take up the loss of adaptation of the damaged structure. This of course is not infinite or perfect adaptation but contingent. Pain is always a likely sequela in humans.

Ideally everyone would take responsibility for their own health and well being and always eat right and exercise, and after an injury follow that same course, disallowing atrophy, neurologic consequences and mal-adaptation. In the real world, where that is rarely the case, they come to the chiropractor (hopefully, since any other practitioner will cost them more and do them less good) and we begin a series of treatments meant to address the “cause” of their trouble. Hopefully if the disc is involved and if imaging has been ordered, a full complement of therapies will be tried. They should include manual treatments (manipulation if warranted), axial traction (if signs of compression including somatic or radicular referral symptoms are present) and active exercises to eventually include progressive resistance (we always include high-power laser and pulsed or continuous diathermy in our total disc treatment protocol as well).

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About The Author — Dr. Kennedy has developed, tested and taught what has proven to be a highly-effective and easy-to-learn chiropractic decompression therapy technique.