Nachemson (1966), using intradiscal pressure measurements, documented the higher loads on the discs in various sitting postures compared to the standing posture.

Normal sitting causes flexion in the lumbar spine, and people, if left alone, generally sit in a variety of flexed postures (Callaghan and McGill, 2001b).

Sitting generally involves lower abdominal wall activity (particularly the deep abdominaIs) compared to standing and generally higher extensor activity with unsupported sitting (see Callaghan, Patia, and McGill, 1999 for walking and Callaghan and McGill, 2001b for sitting).

Sitting slouched minimizes muscle activity, while sitting more upright requires higher activation of the psoas and the extensors (Juker, McGill, Kropf et al., 1998).

Full flexion increases disc annulus stresses; this posture has produced disc herniations in the lab (e.g., Wilder, Pope, and Frymoyer, 1988).

In fact, Kelsey (1975) discovered a specific link between prolonged sitting and the incidence of herniation. More upright sitting postures, and the concomitant psoas and other muscle activation, impose additional compressive loads on the spine. Changing lumbar postures causes a migration of the loads from one tissue to another.
Callaghan and McGill (2001b) suggested that no single, ideal sitting posture exists; rather, a variable posture is recommended as a strategy to minimize the risk of tissue overload.

Despite the myth perpetuated in many ergonomic guidelines regarding a single "ideal" posture for sitting, the ideal sitting posture is one that continually changes, thus preventing any single tissue from accumulating too much strain.

McKenzie (1979) proposed that the nucleus within the annulus migrates anteriorly during spinal extension and posteriorly during flexion. McKenzie's program of passive extension of the lumbar spine (which is currently popular in physical therapy) was based on the supposition that an anterior movement of the nucleus would decrease pressure on the posterior portions of the annulus, which is the most problematic site of herniation.

If compressive forces were applied to a disc in which the nuclear material were still posterior (as in lifting immediately after a prolonged period of flexion), a concentration of stress would occur on the posterior annulus.

The athletic world provides good examples as well, such as sitting on the bench before engaging in play. Those with sensitive backs would do well to avoid siting on the bench with a flexed lumbar spine while waiting to perform.