

Flexion Stress on the Spine:

The Lower Back

Sitting all day, which many of us have become far too accustomed to, puts a tremendous amount of stress on our bodies. In the slumped position, the weight bearing bones of the lower back become particularly vulnerable. These bones are designed to sit directly on top of each other, with a slight anterior curve. In this position, the forces of gravity and weight bearing are distributed through the vertebral bodies and the intervertebral discs—our "shock absorbers". However, whether due to poor biomechanics in the way we sit or due to poor design from those who make our chairs, many of us do not sit correctly. The normal anterior curve flattens or even reverses, exposing us to potential injury.

When we slump, the weight bearing load in the low back are transferred from the vertebral bodies and discs (the shock absorbers) to the posterior facet joints and muscles of the low back. These structures are not designed for this; they are designed for movement, not shock absorption. In addition, the discs must now withstand a tremendous amount of shear force—in effect, each vertebra is being pulled forward from the one above it. Discs are designed for axial loading—i.e., vertical/straight down forces. Shearing is a horizontal force. Eventually, this leads to wear and tear and pain.

Flexion stress on the low back is further exacerbated by tightness in the hamstring and hip muscles. When these muscles are tight, it pulls the pelvis into posterior tilting. With a posterior tilt to the pelvis, the natural anterior curve of the low back vertebrae is flattened or reversed, and we are exposed to the pain and injury described above.

Exercises for those with low back pain should emphasize improving hip and hamstring mobility and flexibility, endurance of middle core muscles, and reaction time of inner core muscles.

Exercises that expose the low back to flexion stress and shear forces should be avoided: spinal forward bending, full sit ups or rollups, all flexion with rotation exercises (Russian twists, seated rotational twists).