

LOW BACK PAIN

Most episodes of low back pain are caused by relatively harmless conditions. The most common of these conditions include: muscle strain (“pulled muscle”), weak core muscles (abdominal and lumbar extensor muscles), degenerative discs, arthritic facets, spinal instability (spondylolisthesis- slipping of the bones), scoliosis and a myriad of other more rare conditions. Low back pain affects up to 90% of the population at some point in their lifetime.

The most common reason for back pain is due to the normal aging process of the discs in the low back. This wear is a combination of biological changes that occur in the disc (determined by one’s genetic program) as well the mechanical effects of absorbing both weight and allowing motion to occur between the bones and the disc. This mechanical wear is very similar to the wearing of a car tire or the sole of a shoe with increasing use. Low back pain results when these discs reach a critical level where they can no longer absorb shock efficiently (Figure 1).



Figure 1: MRI demonstrating normal degenerative discs at every level except at L5-S1 where the disc has degenerated (“worn out”). Note how the other discs are tall and have the white core (hydrated “jelly” inside a donut) whereas the L5-S1 disc is dark and has no white core in it. Thus, the L5-S1 disc has lost its ability to absorb shock and may lead to pain during a “flare up.” This patient had back pain of the “discogenic” pattern. Xray demonstrating degenerative discs.

This common form of back pain is called discogenic pain (implying pain from the discs). The pain is usually worse with prolonged sitting or standing. The person may note that they are often stiff and sore in the morning after waking. Bending and lifting are often uncomfortable. Frequent position changes and walking short distances may reduce the pain. The natural history of discogenic pain is that of intermittent episodes of back pain that occur over many years. This is not a dangerous condition and treatment is based on the severity of the pain. Improving your aerobic conditioning can help in the long term management of this condition. Even if aerobic activities cause back pain, they should be pursued. No long term harm will result in exercising through the back pain.

For most patients, using anti-inflammatory medications will alleviate the pain during the episodic flare-ups. Physical therapy for strengthening, stretching, body mechanics, etc can be helpful in those patients with more severe and persistent pain. Epidural steroid injections are reserved for those patients who have persistent pain and have failed physical therapy. While most patients do not need surgery for this condition, some patients who have failed all other treatment modalities and continue to suffer from severe pain, may benefit from surgery.

A person with discogenic low back pain should expect intermittent episodes of short lasting back pain over many years. Each episode of back pain generally lasts less than three weeks and certainly no more than six weeks. If at any point the pain lasts longer than expected, the condition should be re-evaluated by a physician. If the pattern of pain changes then it should be re-evaluated by a physician.



Figure 2A: Standing X-ray demonstrating a “spondylolisthesis.” Note how the L2, L3 and L4 bones are lined up, as demonstrated by the smooth blue line drawn at the back of the bones. However, a line drawn behind the bones of L4 and L5 is NOT smooth and demonstrates a “step” between those two bones...there is a forward slipping of the L4 bone on the L5 bone! This slipping of the bones is called a spondylolisthesis and can cause back pain with or without leg pain/numbness/tingling/burning etc. These symptoms can be present all the time but are generally worse with sitting, standing or walking and improve when the patient lies down. This is because as the patient sits or stands, there is more stress on the bones and the slip gets worse- thus more pain! When the patient lies down, there is less stress on the bones at the slip; thus, there is a decrease in the pain.

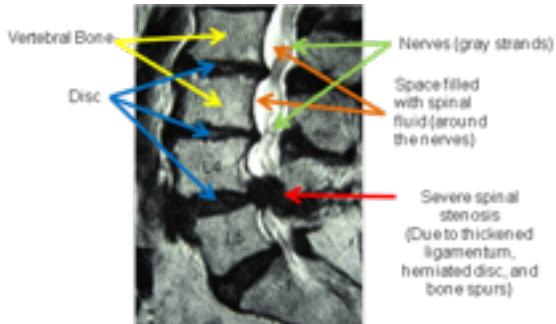


Figure 2B. The MRI above is of the same patient. However, note that the slip at L4-5 is not as dramatic as on the X-ray. Why? Because the MRI is done with the patient lying down! Hence, less stress on the L4 and L5 bones and less slipping! Most of these slips eventually lead to stenosis (tightening around the nerves) because the slipping narrows the spinal canal and the abnormal forces at the slip cause bone spurs, disc herniations and thickening of the ligamentum...all of which contribute to the stenosis. Treatment is determined based on the patient's symptoms as described earlier in this article.



Figure 3. CT scan demonstrating a degenerative facet joint. *Normal* facet joints have a smooth surface made of cartilage that slides against each other. One of the facet joints is more worn out (right side of this page) than the other facet joint. This can lead to back pain as two uneven, rough surfaces move against each other.



Figure: Scoliosis is a curvature of the spine that is more than 10 degrees in the frontal plane (looking at the patient face to face). The above radiograph demonstrates a scoliotic curve.

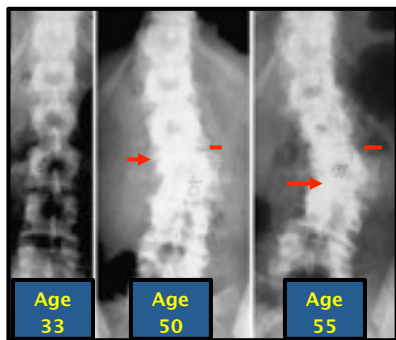


Figure: These radiographs demonstrate the progression of scoliosis over a period of 22 years. Notice how rapidly the curve has progressed from age 50 to 55 (15 degrees). [Aebi M. Eur Spine J 1995]