

Exercise and Back Pain

By: Peter F. Ullrich, Jr., MD

A typical response to experiencing back pain is to take it easy - either staying in bed or at least stopping any activity that is at all strenuous. While this approach is understandable and may even be recommended in the short term, when done for more than a day or two it can actually undermine healing. Instead, active forms of back exercises are almost always necessary to rehabilitate the spine and help alleviate back pain.

When done in a controlled, gradual, and progressive manner, active back exercises distribute nutrients into the disc space and soft tissues in the back to keep the discs, muscles, ligaments and joints healthy. Consequently, a regular routine of lower back exercises helps patients avoid stiffness and weakness, minimize recurrences of lower back pain, and reduce the severity and duration of possible future episodes of low back pain.

Depending upon the patient's specific diagnosis and level of pain, the back pain exercises and rehabilitation programs will be very different, so it is important for patients to see a spine specialist trained to develop an individualized program of back exercises and to provide instruction on using the correct form and technique.

To be effective, a patient's program of back exercises should be comprehensive, working the whole body even if it targets the back. Two back exercises commonly advised by physical therapists to treat back pain are McKenzie exercises and dynamic lumbar stabilization.

A balanced workout of back exercises should include a combination of stretching, strengthening, and low impact aerobic conditioning.

Specific Hamstring Stretches for Back Pain Relief

The hamstrings run through the back of each thigh. Tightness in this muscle limits motion in the pelvis which can increase stress across the low back and corrupt correct posture. Stretching the hamstrings with these following exercises (or as part of a routine of back exercises) can gradually lengthen them and reduce the stress felt in the lower back.

Options for hamstring stretching exercises, listed from most difficult to least difficult, include:

Standing Hamstring Stretch

This is the most common technique. While standing, simply bend forward at the waist with arms hanging down and with legs relatively straight. Try to touch the toes but do not strain to do so. Stop when a stretch is felt in the hamstring.

Chair Hamstring Stretch

Less strain is applied to the back by sitting on a chair and placing the legs straight out in front on another chair. In this position, reach toward the toes. One leg at a time may be stretched.

Towel Hamstring Stretch

One of the least stressful stretching techniques is to lie on the floor and pull the leg up and straighten by holding onto a towel that is wrapped behind the foot. One leg at a time may be stretched.

Wall Hamstring Stretch

Another less stressful option is to lie on the floor, with the buttocks against a wall, and place the foot up against the wall and then try to push the knee straight. One leg at a time may be stretched.

Hamstring stretching should include applying pressure to lengthen the hamstring muscle for 30-45 seconds at a time, one to two times each day. The hamstring muscles will lengthen over time, decreasing stress on the low back. Since other hamstring and back exercises may not be done everyday, stretching should not be just linked to other exercises.

In order to make stretching exercise a part of one's daily routine, it is best to stretch every morning when getting up and before going to bed. Stretching exercises are good back hygiene, just like brushing one's teeth twice a day is good dental hygiene.

Back Strengthening Exercises

Just like reinforced steel can bear more weight than sheet aluminum, a strong, well-conditioned back can withstand more stress, and protect the spine better, than a back that has not been conditioned through exercise. Conditioning through flexibility and strengthening back exercises not only helps the back avoid injury, or minimize the severity of injury if the spine is traumatized, it also can help relieve the pain of many back conditions.

Many back exercises can help strengthen the spinal column and the supporting muscles, ligaments and tendons. Most of these back exercises focus not only on the back, but also the abdominal (stomach) muscles and gluteus (buttocks) and hip muscles. Taken together, these strong 'core' muscles can provide back pain relief because they provide strong support for the spine, keeping it in alignment and facilitating movements that extend or twist the spine.

Two of the most well-known back strengthening exercises are: McKenzie exercises and Dynamic Lumbar Stabilization. These back exercises are generally first learned by working with a physical therapist who can demonstrate the exercises and correct a patient's form to ensure strengthening and/or back pain relief is achieved. Although McKenzie exercises and dynamic lumbar stabilization exercises tend to be used for specific conditions, the two forms of physical therapy exercise may also be combined when appropriate.

McKenzie Exercises

These back exercises are named after a physical therapist in New Zealand who found that extending the spine through exercise could reduce pain generated from a compromised disc space. Theoretically, extension exercises may also help reduce the herniation of the disc itself and reduce pressure on a nerve root. There is a wide range of McKenzie exercises, some of which are done standing up while others are performed lying down. All of these upper and lower back exercises use core muscle contraction and, usually, arm motions to stabilize the trunk and extend the spine.

For patients who are suffering from leg pain due to a disc herniation (a radiculopathy), extending the spine with McKenzie back exercises may also help reduce the leg pain by "centralizing" the pain (moving the pain from the leg to the back). For most patients, back pain is usually more tolerable than leg pain, and if a patient is able to centralize the pain, they may be able to continue with non-surgical treatment (such as exercise) and avoid a surgical discectomy.

When the pain is acute, the exercises should be done frequently (every one to two hours). To be effective, patients should try to avoid flexing the spine (bending forward) during exercising as this undercuts the strengthening motion.

McKenzie exercises may also be helpful for those individuals who have back pain due to degenerative disc disease. While sitting or flexing forward can accentuate low back pain for patients with degenerative disc disease, extending the spine can serve to relieve the pressure on the disc. Note that the opposite is true in elderly patients who have facet osteoarthritis and/or lumbar stenosis (extending the spine jams the facet joints on the back and increases pressure across the joints, so these patients will typically feel better sitting, and have more pain with extension).

Dynamic Lumbar Stabilization Exercises

With this back exercise technique, the physical therapist first tries to find the patient's "neutral" spine, or the position that allows the patient to feel most comfortable. The back muscles are then exercised to teach the spine how to stay in this position. This back exercise technique relies on proprioception, or the awareness of where one's joints are positioned. Performed on an ongoing basis, these back exercises provide pain relief and help keep the back strong and well positioned.

Lumbar stabilization back exercises may also be done in conjunction with McKenzie exercises. The McKenzie exercises serve to reduce back pain, and the lumbar stabilization exercises help strengthen the back. Stabilization back exercises can be rather rigorous and therefore may not be well tolerated by all patients. It may be advisable for elderly patients or patients in significant pain to use other less strenuous means of physical therapy and back exercise to strengthen the back.

The above two back exercise programs are commonly prescribed to treat low back pain and leg pain, but many other forms of exercise can also provide pain relief and help with rehabilitation. The important aspect is that the exercise includes controlled, progressive strengthening exercises. Alternative forms of strengthening exercise that can be gentle on the back include Pilates, yoga and tai chi. There are several forms of these disciplines, and they are best learned working with a certified trainer or practitioner.

Low-Impact Aerobic Exercise

Along with specific back exercises, aerobic exercise that increases the heart rate for a sustained period is very beneficial for helping back problems. Aerobic exercise increases the flow of blood and nutrients to back structures which supports healing, and can decrease the stiffness in the back and joints that lead to back pain. While many patients with back pain are able to participate in vigorous exercise like running or step aerobics, others find it easier to engage in low-impact exercise, which does not jar the spine.

Benefits of Aerobic Exercise

Reconditioning through aerobic exercise is very useful for both rehabilitation and maintenance of the lower back. Patients who regularly undertake aerobic exercise to condition the back will benefit in several ways:

- They have fewer episodes of low back pain, and will experience less pain when an episode occurs.
- They are also more likely to stay functional (e.g. continue working and carry on with recreational activities), whereas those patients with chronic low back pain who do not engage in aerobic exercise are more likely to experience the gradual loss of functional capabilities.
- It is easier to control weight or lose weight, decreasing the stress placed on the spine structures and joints.
- An increased production of endorphins after 30 or 40 minutes of exercise can combat pain. These bio-chemicals are the body's natural painkiller, and frequent release of them can help patients reduce their reliance on pain medication.
- Endorphins can elevate mood and relieve symptoms of depression, a condition common in those with back pain or a back injury.

Types of Low Impact Exercise

There are several types of aerobic exercise that are gentle on the back and, when done on a regular basis, highly effective in providing conditioning.

- **Walking.** In general, walking for exercise is very gentle on the back, and walking two to three miles three times per week is very helpful for patients. Walking also has the advantage of not requiring special equipment (except a good pair of shoes suitable for walking) and it can be done inside or outside, in almost any location, including at home on a treadmill.
- **Stationary bicycling.** For those patients who are more comfortable seated rather than standing, biking or stationary biking may be preferable. Bicycling or 'spinning' classes have grown in popularity over the last decade as more people realize the benefits of this lower impact form of exercise. There are several upright and recumbent (reclining) bikes that can be purchased for home use, and many come with programs preloaded so that patients have a good variety of sessions from which to choose.
- **Elliptical trainer or step machine.** These machines provide a low-impact workout because the participant is using pedals suspended above the ground to move in a continuous oval motion, as opposed to continuously stepping on a hard surface. The motor on the machine facilitates a smoother step or forward glide motion, which is less jarring than walking. The benefit of these machines is that they provide an aerobic workout as well as strengthening or resistance training because the arms of most cross-training machines can be pushed and pulled, thus working the upper body, and the resistance of the pedaling motion increased to require greater muscle exertion to maintain the movement.
- **Water therapy.** Doing exercise in the water provides for effective conditioning while minimizing stress on the back because the buoyancy of water counteracts the gravitational pull that can compress the spine. When 'unweighted' in water, a patient becomes more mobile, and stretching and strengthening exercises are less painful. Exercises such as hip abduction lifts, bicep curls, arm circles to exercise deltoids and shoulders, and tricep kickbacks are all easier done water for most people. All these muscles build strength in the low back or neck, and reduce back pain. Water therapy exercise is especially useful for patients in too much pain to tolerate land exercises on a mat or hard floor, or for elderly patients.

Whatever low-impact exercise is used, the exercise should be vigorous enough to increase the heart rate to the target zone (which is scaled to the age of the patient) and keep it elevated. Elevating the heart rate for at least 20 minutes is required to improve cardiovascular strength, burn excess calories, and make noticeable strides in fitness.