



## Low-Back Sprain

### DESCRIPTION

Low-back sprain is an injury to the ligaments of the lower back or pelvis. These ligaments are very strong and require great force to be injured. The ligaments of the lower back and pelvis are important in maintaining the stability to the spinal column and thus the ability to stand upright while still being able to move, bend, and twist.

### COMMON SIGNS AND SYMPTOMS

- Severe pain in the back, occasionally with a feeling of a pop, snap, or tear at the time of injury
- Tenderness and occasionally swelling at the injury site
- Uncommonly, bruising after 24 to 48 hours
- Muscle spasms in the back

### CAUSES

Low-back sprain is caused by stress on a ligament that temporarily forces the bony spine or pelvis out of its normal location. A sprain of the low back often occurs when a stressful act is performed while off balance or during repeated stress involving the muscles of the low back. It may also occur as the result of a direct blow. Sprains of the low back usually require a significant amount of force.

### FACTORS THAT INCREASE RISK

- Contact sports (football or wrestling); also common in major skiing accidents or other collisions
- Sports that require throwing or lifting, including weightlifting
- Sports involving twisting of the spine (gymnastics, diving, tennis, golf)
- Poor physical conditioning (strength, flexibility)
- Inadequate protection
- Previous back injury or surgery, especially fusion

### PREVENTIVE MEASURES

- Wear proper protective equipment, and ensure a correct fit.
- Appropriately warm up and stretch before practice and competition.
- Maintain appropriate conditioning that includes back and hamstring flexibility, muscle strength and endurance, and cardiovascular fitness training.
- Maintain an ideal body weight.

### EXPECTED OUTCOME

Low-back sprain is usually curable with appropriate treatment, although healing may be prolonged, depending on the severity of injury.

### POSSIBLE COMPLICATIONS

- Frequent recurrence of symptoms, resulting in a chronic problem; appropriately addressing the problem the first time decreases the frequency of recurrence.
- Chronic inflammation and pain in the low back
- Delayed healing or delayed resolution of symptoms, particularly if activity is resumed too soon
- Prolonged disability
- Unstable or arthritic joints of the low back

### GENERAL TREATMENT CONSIDERATIONS

Sprain to the low back results in pain and inflammation. The pain and inflammation result in muscle spasms of the back muscles, which in turn result in more pain. Thus the initial treatment consists of rest, medications, and ice to relieve pain, inflammation, and muscle spasms. As pain and spasms subside, exercises to improve strength and flexibility and proper back mechanics are started. Referral to a physical therapist or athletic trainer may be recommended for these exercises, for education regarding back mechanics, and possibly for other treatments, such as transcutaneous electronic nerve stimulation (TENS) or ultrasound. A corset or back brace may also be recommended, and biofeedback and psychotherapy may be prescribed, too. Occasionally an injection of cortisone with or without local anesthetics may be attempted to help relieve the pain and spasms. Prolonged bed rest is felt to do more harm than good, but proper body mechanics should be encouraged, such as bending your knees to pick things up off the ground, as opposed to bending at the waist; sleeping flat on your back on a firm mattress with a pillow under your knees; and using good posture when sitting. With severe sprains involving more than one ligament that result in the spinal column or pelvis being unstable, surgery may be required to stabilize the spine and pelvis.

### MEDICATION

- Nonsteroidal antiinflammatory medications, such as aspirin and ibuprofen (do not take for 7 days before surgery), or other minor pain relievers, such

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as acetaminophen, are often recommended. Take these as directed by your physician, and contact your doctor immediately if any bleeding, stomach upset, or signs of an allergic reaction occur.

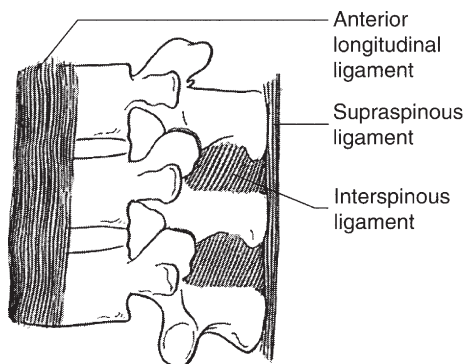
- Topical analgesic ointments may be of benefit.
- Pain relievers and muscle relaxers may be prescribed as necessary. Use these only as directed, and take only as much as you need. Do not operate any heavy machinery or drive a car while taking these medications.
- Oral corticosteroids or injections of corticosteroids into the spot of the most muscle spasms or pain may be attempted.

### HEAT AND COLD

- Cold is used to relieve pain and reduce inflammation. It should be applied for 10 to 15 minutes every 2 to 3 hours as needed and immediately after any activity that aggravates your symptoms. Use ice packs or an ice massage.
- Heat may be used before performing stretching and strengthening activities prescribed by your physician, physical therapist, or athletic trainer. Use a heat pack or a warm soak.

### WHEN TO CALL YOUR DOCTOR

- Symptoms get worse or do not improve in 2 to 4 weeks despite treatment.
- You develop numbness or weakness in either leg.
- You lose bowel or bladder function.
- Any of the following occur after surgery: fever, increased pain, swelling, redness, drainage, or bleeding in the surgical area.
- New, unexplained symptoms develop. Drugs used in treatment may produce side effects.



**FIGURE 1** From Jenkins DB: *Hollinshead's functional anatomy of the limbs and back*, ed 6, Philadelphia, 1991, W.B. Saunders, p 191.

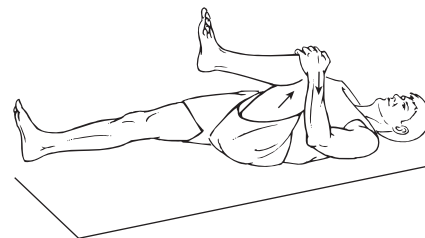
### RANGE OF MOTION AND STRETCHING EXERCISES

#### Low-Back Sprain

The exact range of motion and stretching exercises appropriate for you usually need to be determined on an individual basis. Some individuals respond better to flexion (pulling your knees to your chest), whereas others respond better to extension (arching your back). The key point to remember is that if any exercise—range of motion, stretching, or strengthening—causes pain to radiate away from your back and toward your buttocks or legs, *stop immediately*. The purpose of these exercises is to begin to decrease the intensity and the size of the painful area.

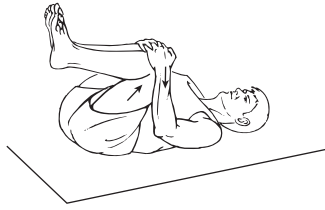
These are some of the *initial* exercises you may use to start your rehabilitation program, until you see your physician, physical therapist, or athletic trainer again, or until your symptoms resolve. Both flexion and extension exercises are presented. *The specific exercises that are appropriate for you must be specified by your physician, physical therapist, or athletic trainer before you start.* Please remember:

- Flexible tissue is more tolerant of the stresses placed on it.
- A *gentle* stretching sensation should be felt.
- If pain or other symptoms radiate away from your back toward your buttocks or legs, *stop exercising immediately*.



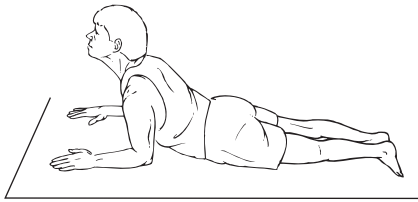
### RANGE OF MOTION • Lumbar Flexion

1. Lie on your back with both legs flat on the floor.
2. Bend one hip and knee up toward your chest.
3. Grasp the knee with your hands, and pull it gently toward your chest. Keep your other leg flat on the floor.
4. Repeat with the opposite side.
5. Repeat this exercise \_\_\_\_ times, \_\_\_\_ times per day. Hold each repetition for \_\_\_\_ seconds.



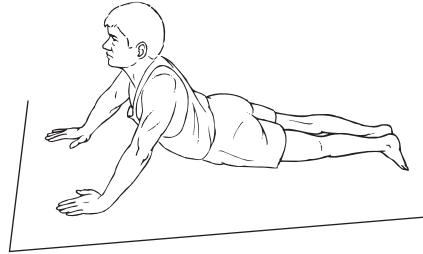
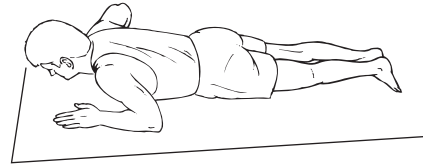
### RANGE OF MOTION • Lumbar Flexion

1. Lie on your back with both legs flat on the floor.
2. Bend one hip and knee up toward your chest and then the other.
3. Grasp your knees with your hands, and pull them gently toward your chest.
4. Hold this stretch for \_\_\_\_ seconds.
5. Release one knee, allowing the leg to return to the floor, then release the other.
6. Repeat this exercise \_\_\_\_ times, \_\_\_\_ times per day.



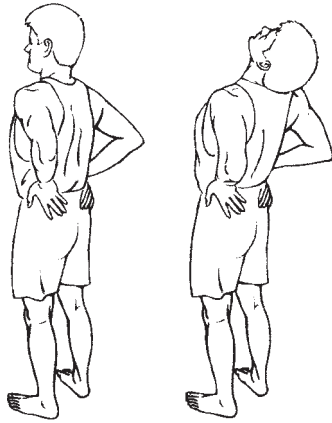
### RANGE OF MOTION • Lumbar Extension

1. Lie on your stomach on the floor.
2. Place your arms underneath you, and prop up on your elbows as shown.
3. Allow your back to relax and sag. Hold this position for \_\_\_\_ seconds.
4. Return to the starting position, lying on your stomach, flat on the floor.
5. Repeat this exercise \_\_\_\_ times, \_\_\_\_ times per day.

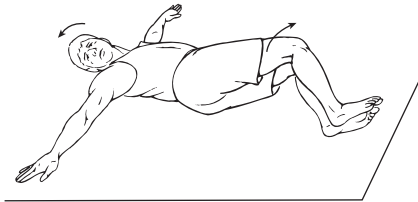


### RANGE OF MOTION • Lumbar Extension

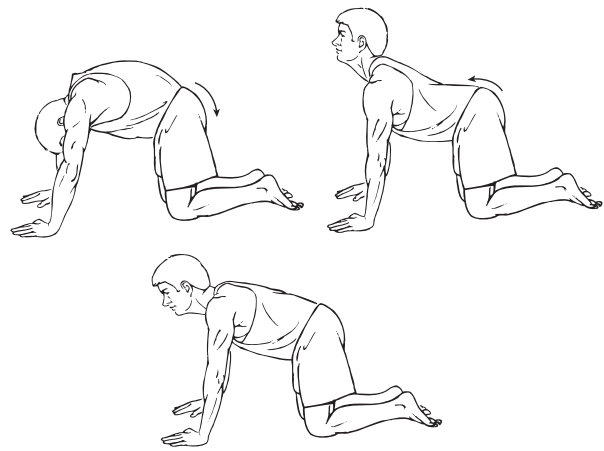
1. Lie on your stomach on the floor as shown in the picture.
2. Place your palms flat on the floor. Push down on your hands, straightening out your arms and putting an arch in your back. Straighten your elbows fully, keeping your hips on the floor.
3. Return to the starting position.
4. If you are unable to fully straighten your elbows while keeping your back relaxed, place your hands farther out in front of you, and try again.
5. Repeat this exercise \_\_\_\_ times, \_\_\_\_ times per day. Hold each repetition for \_\_\_\_ seconds.

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1. Stand erect and place your hands on the back of your buttocks as shown.
2. Bend backward until you feel a gentle stretch in your back. Return to the starting position. Hold each repetition \_\_\_\_ seconds.
3. Repeat this exercise \_\_\_\_ times, \_\_\_\_ times per day.

**RANGE OF MOTION • Lumbar Rotation**

1. Lie on your back with your hips and knees bent and your feet flat on the floor. Keep your arms out at your sides and your shoulders flat on the floor.
2. Rotate your hips and knees to one side as far as you can, keeping your arms and shoulders flat on the floor. Hold this position for \_\_\_\_ seconds.
3. Reverse position and rotate your hips and knees to the opposite side. Hold this position for \_\_\_\_ seconds.
4. Repeat this exercise \_\_\_\_ times, \_\_\_\_ times per day.

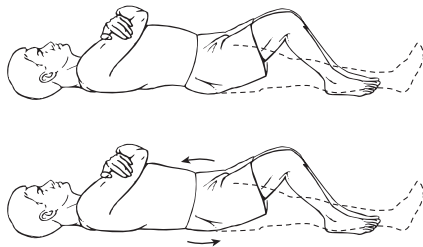
**FLEXIBILITY • Lumbar Stretch**

1. Position yourself on your hands and knees as shown.
2. Tighten your stomach muscles and tuck your pelvis under, arching your back as shown in the diagram. Hold this position for \_\_\_\_ seconds.
3. Tighten your back muscles, rotating your buttocks up and allowing your back to arch and sag as shown. Hold this position for \_\_\_\_ seconds.
4. Find a neutral position. Tighten your stomach and back muscles. Hold this position for \_\_\_\_ seconds.
5. Repeat this exercise \_\_\_\_ times, \_\_\_\_ times per day.

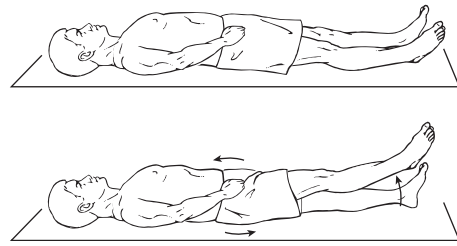
**STRENGTHENING EXERCISES****Low-Back Sprain**

These are some of the *initial* exercises you may use to start your rehabilitation program, until you see your physician, physical therapist, or athletic trainer again, or until your symptoms resolve. Please remember:

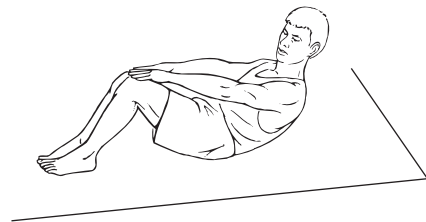
- Strong muscles with good endurance tolerate stress better.
- Do the exercises as *initially* prescribed by your physician, physical therapist, or athletic trainer. Progress slowly with each exercise under their guidance, gradually increasing the number of repetitions and weight used.
- If pain or other symptoms radiate away from your back toward your buttocks or legs, *stop the exercises immediately*.

**STRENGTH • Pelvic Tilt**

1. Lie on the floor as shown. You may do this exercise with your knees bent or straight, but it is harder with the knees straight.
2. Tighten your stomach and buttocks, and push back flat onto the floor. If you do this properly, your pelvis will rotate in the direction shown in the diagram. Hold each repetition for \_\_\_\_ seconds.
3. Repeat this exercise \_\_\_\_ times, \_\_\_\_ times per day. Count out loud, and do not hold your breath.

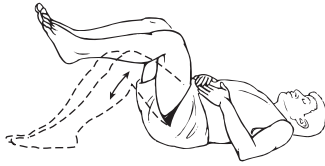
**STRENGTH • Pelvic Tilt and Stationary Leg Lifts**

1. Lie on the floor as shown. You may do this exercise with your knees bent or straight, but it is harder with your knees straight.
2. Tighten your stomach and buttocks, and push back flat onto the floor. If you do this properly, your pelvis will rotate in the direction shown in the diagram.
3. Keeping your back flat on floor, slowly lift one leg off the floor 6 inches, keeping your knee straight. Count out loud to \_\_\_\_, and *do not let your back arch*.
4. Repeat with the opposite leg.
5. Repeat this exercise \_\_\_\_ times, \_\_\_\_ times per day.

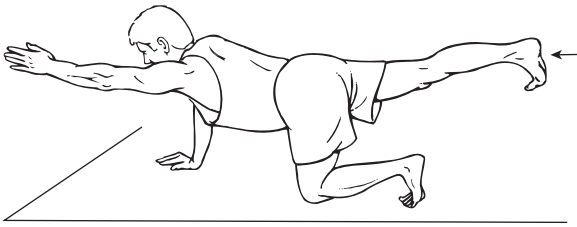
**STRENGTH • Partial Sit-ups**

1. Lie flat on your back with your hands resting on your thighs, and tuck your chin to your chest.
2. *Slowly* sit up until you touch the top of your knees.
3. Hold this position for a count of \_\_\_\_\_. *Count out loud, and do not hold your breath.*
4. Return to the starting position.
5. Repeat this exercise \_\_\_\_ times, \_\_\_\_ times per day.

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**STRENGTH • Double-Leg Hold**

1. Lie on your back with your hips and knees bent toward you as shown.
2. Tighten your stomach muscles, and press your back flat into the floor.
3. Keeping your back flat on the floor, *slowly* let your legs back down. When you feel your back start to arch, stop and hold that position. *Count out loud to \_\_\_\_, and do not hold your breath.*
4. Return to the starting position.
5. Repeat this exercise \_\_\_\_ times, \_\_\_\_ times per day.

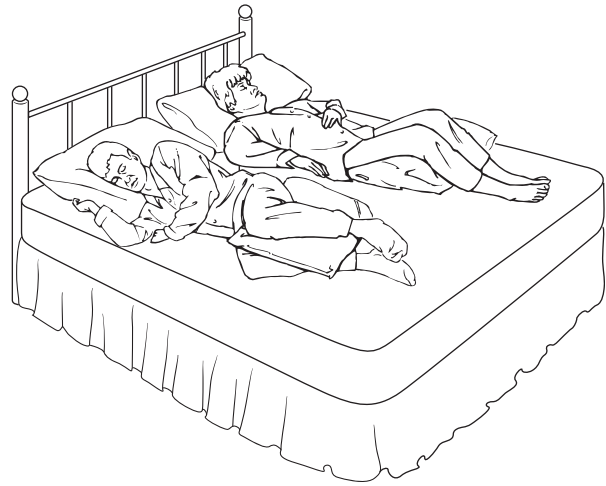
**STRENGTH • Quadruped Lift**

1. Position yourself on your hands and knees.
2. Keep your back flat and parallel to the floor. *Do not allow your back to arch or move during this exercise.*
3. Lift your left arm up to shoulder height. Hold this position, and lift your right leg to the same height.
4. Balance and hold this position for \_\_\_\_ seconds.
5. Return to the starting position, and repeat with the opposite arm and leg.
6. Repeat this exercise \_\_\_\_ times, \_\_\_\_ times per day. *Count out loud, and do not hold your breath.*

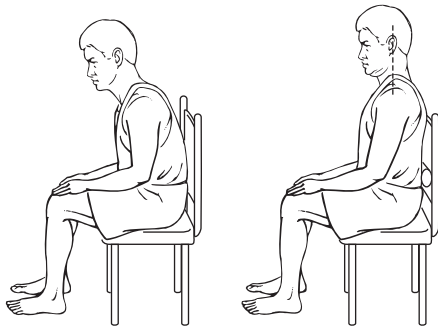
**POSTURE AND BODY MECHANICS  
CONSIDERATIONS**  
 Low-Back Sprain

Maintaining the most appropriate posture and using correct body mechanics can have a significant effect on back pain. The following are basic suggestions regarding proper posture and body mechanics. These should be specifically discussed with your physician, physical therapist, or athletic trainer. Please remember:

- Good posture minimizes the stress and strain on any portion of your spine.
- You can incorporate these posture principles into all of your daily and recreational activities.

**RESTING POSITIONS**

Sleep or rest on a firm surface, and find a comfortable position. The most commonly suggested positions are side lying with a pillow between your knees or on your back with a pillow under your knees.



### PROPER SITTING POSTURE

*Do not slouch!* Sit with a small rolled-up towel, foam cushion, or pillow in your low-back area, just above your belt. Sit with your buttocks all the way back in the chair.



### LIFTING

Do not round out your back when lifting any object. You should make sure that you bend your knees, and attempt to maintain a normal curve in your spine.

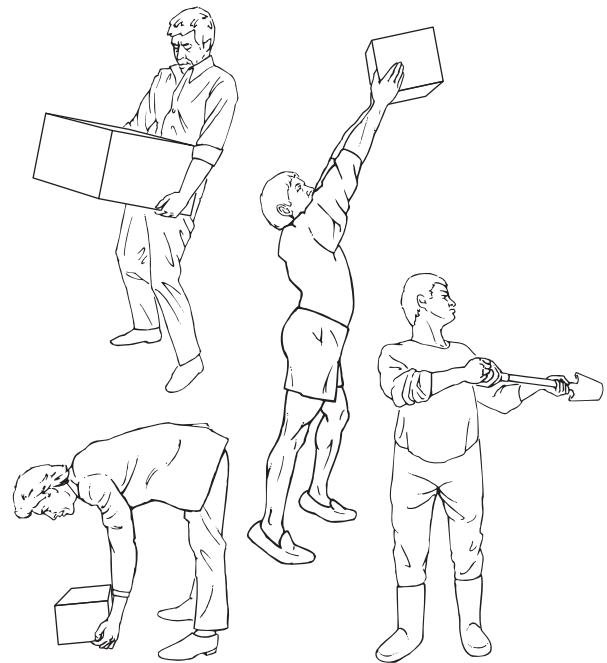
## CORRECT LIFTING TECHNIQUES



### DO

- Lift with your legs, keeping your back straight.
- Use a footstool for objects that need to be placed in or retrieved from high locations.
- Get help lifting heavy or awkward objects.

## INCORRECT LIFTING TECHNIQUES



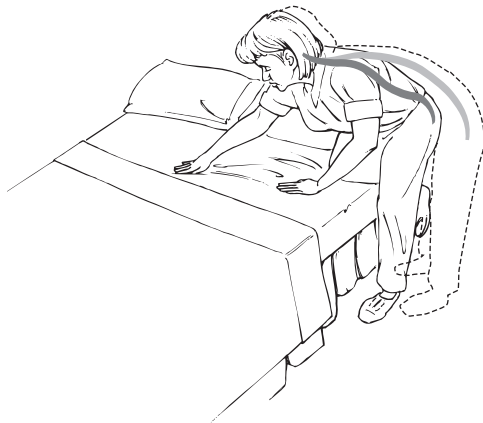
### DO NOT

- *Do not* lift with your legs straight and your back flexed/bent.
- *Do not* lift objects that are too heavy over your head.
- *Do not* lift and twist at the same time.
- *Do not* lift an object that is too heavy or awkwardly shaped without help.



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When you must stand in a position that requires a prolonged period in slight flexion, consider finding a footstool or other object to place one foot on. This will minimize the load on your back.

**PROLONGED ACTIVITY IN A FLEXED POSITION**

Try to avoid doing any activity in a flexed position for a prolonged period. Put one leg up if possible, which will minimize stress on your back.

**CORRECT STANDING POSTURES**

Stand upright and erect whenever possible. You should also attempt to keep a normal spinal posture when doing any activity.

**INCORRECT STANDING POSTURES**

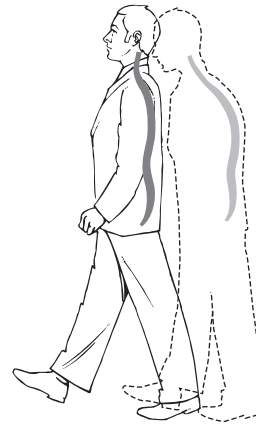
Do not slouch or maintain flexed standing postures for prolonged periods.





### CORRECT SITTING POSTURES

Sit erect. Use a lumbar roll, cushion, or pillow and a chair that has a high enough back to support your back up to your shoulder blades.



### SLOUCHING

Avoid slouching when you walk or stand. Stand up straight, and walk erect and tall.



### INCORRECT SITTING POSTURES

Do not slouch or slump. Maintain a proper position in the chair.